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Policy Paper

Water Justice and Water Diplomacy

In Jordan, Palestine, and Lebanon

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Contents

Introduction: General Context

Water justice and *water diplomacy* have become central concerns in international relations and sustainable development, particularly in regions experiencing acute water scarcity and political instability. Across the Middle East, growing pressure on limited water resources is driven by a combination of population growth, climate change, unsustainable patterns of use, and asymmetrical power relations over shared water sources. In this context, water is no longer only a technical or environmental issue, but a deeply political one, closely linked to questions of sovereignty, Human Rights, security, and regional stability.

The population of the study area, as of mid-2024, is estimated at 24.1 million people, distributed across three highly interconnected contexts: 11.7 million in Jordan,[1] 5.2 million in Lebanon [2] and 7.3 million in historic Palestine.[3] Over the past decade (2015–2025), this region has experienced continuous and overlapping waves of displacement, particularly as a result of the Syrian civil war, the war of extermination in Gaza and its regional repercussions–especially on Lebanon–and displacement from southern Lebanon. These demographic pressures have placed additional strain on already fragile water systems, intensifying competition over scarce resources, and deepening inequalities in access and distribution.

At the same time, the region is facing severe water scarcity exacerbated by climate change, such as declining rainfall, rising temperatures, and increasing frequency of extreme

[1] Jordanian Department of Statistics. (2025). Estimated Population of the Kingdom by Municipality and Sex, at End-year 2025. (2025). In *Jordan Population Statistics Directorate.* https://dosweb.dos.gov.jo/DataBank/Population/Population_Estimares/Municipalities.pdf

[2] Al Jazeera. (2024). Lebanon... Land of Cedars and Ancient Civilizations (Source in Arabic) https://www.aljazeera.net/encyclopedia/2014/10/30/

[3] Palestinian Central Bureau of Statistics (PCBS). (December 31, 2024). The situation of Palestinians at the end of 2024 and on New Year's Eve 2025. https://www.pcbs.gov.ps/post.aspx?lang=en&ItemID=5901

weather events. These environmental pressures intersect with political and legal factors, including unequal control over transboundary water resources, weak regional cooperation, and, in the case of Palestine, the structural constraints imposed by Israeli occupation. As a result, water consumption and availability remain profoundly unequal, both between countries and within them, fueling social grievances and geopolitical tensions.

To frame this analysis, it is essential to clarify the concepts of *water justice* and *water diplomacy*. On the one hand, *water justice* refers to the equitable distribution of water resources and the guarantee of fundamental water rights for all, without discrimination based on geography, economic status, or political power. It rests on four core principles: the United Nations' recognition of the right to water as a fundamental Human Right; fair and equitable distribution of water between countries and among local communities; meaningful community participation in decision-making related to water management; and the protection of aquatic ecosystems from overexploitation and pollution.

The right of all peoples to access drinking water in quantities sufficient to meet their basic needs is firmly established in international law. The *United Nations Resolution 72/178* (2018),[4] entitled "Human Rights to Safe Drinking Water and Sanitation," affirms that "the human rights to safe drinking water and sanitation derive from the right to an adequate standard of living and are closely linked to the right to the highest attainable standard of physical and mental health, as well as to the right to life and human dignity." In practical terms, these rights guarantee everyone, without discrimination, access to water for personal and domestic use that is sufficient, safe, acceptable, and affordable. They also ensure access to sanitation services that are safe, hygienic, culturally appropriate, and available in all areas of life, while preserving privacy and human dignity as part of the broader right to an adequate standard of living.

[4] United Nations. *Resolution adopted by the General Assembly on 19 December 2017.* (2017, December 19). United Nations General Assembly. https://docs.un.org/en/a/res/72/178

On the other hand, *water diplomacy* refers to the use of diplomatic, legal, and technical tools to prevent and resolve water-related disputes and to promote cooperation in the management of shared water resources. Its primary objectives include preventing conflicts through negotiation and formal agreements, strengthening technical and scientific cooperation between riparian states,[5] and integrating water considerations into national security, climate adaptation, and sustainable development strategies. Hence, in water-scarce and politically fragmented regions, effective *water diplomacy* is a prerequisite for achieving long-term *water justice*.

Against this backdrop, this paper examines the reality of *water justice* and the pathways of–water *diplomacy* in Jordan, Palestine, and Lebanon. It analyzes national water legislation and policies, regional and bilateral water agreements, and the political dynamics shaping access to water resources. It also explores the impacts of climate change, displacement, and conflict on water availability and governance, while highlighting the structural inequalities that undermine equitable access to water across the three contexts.

Problem Statement

Despite the international recognition of water as a fundamental Human Right, water governance in Jordan, Palestine, and Lebanon remains marked by structural inequality, fragmented institutions, and weak enforcement of legal and regulatory frameworks. Chronic water scarcity, compounded by climate change, displacement, and unequal control over shared water resources, has produced deep disparities in water access, affordability, and quality. Existing agreements and governance mechanisms have proven insufficient to ensure fair distribution or to prevent the politicization of water–particularly under conditions of occupation, conflict, and regional instability. Consequently, water

[5] Riparian states are nations or political entities that share a common border along a river, lake, or transboundary water system. These states are directly connected to the water source, meaning their territories are either traversed by or adjacent to the waterway. They possess rights and responsibilities regarding the shared resource's equitable use and ecological health.

increasingly functions as a tool of control rather than as a shared public good, undermining human dignity, social cohesion, and sustainable development.

Objectives of the Paper

This paper aims to analyze *water justice* and *water diplomacy* in Jordan, Lebanon and Palestine, within the geographical borders of the West Bank and the Gaza Strip, through a comparative and regional lens. Its specific objectives are to:

1. Assess the legal, institutional, and political frameworks governing water resources in the three countries.
2. Examine the role of transboundary water agreements and regional power dynamics in shaping access to water.
3. Analyze the impacts of climate change, displacement, and conflict on water availability, quality, and governance.
4. Identify key challenges preventing the realization of *water justice* at national and regional levels.
5. Propose policy-oriented recommendations that promote equitable water distribution, strengthen *water diplomacy*, and advance *water justice* as a foundation for Human Rights, stability, and sustainable development in the region.

I- Water Availability, Scarcity, and Per Capita Shares

Jordan, Lebanon, and Palestine face acute and growing water stress, though for different structural and political reasons.

Jordan is among the four poorest countries globally in water resources, suffering chronic scarcity driven by low rainfall, population growth, an influx of refugees, and severe groundwater over-extraction. Its annual per capita share of renewable freshwater is less

than 63 m^3–far below the global water poverty threshold of 500 m^3/capita/year–resulting in a national water deficit of roughly 500 million m^3. [6]

Lebanon, while hydrologically better endowed–with around 4.225 billion m^3 of renewable water annually to match a 1.192 billion m3 demand–struggles with mismanagement, distribution losses, and climate change, which is projected to reduce rainfall by 10–20% by 2030. As a result, its annual per capita share has dropped from 1,200 m^3 in 2010 to below 800 m^3 today. [7]

Palestine, under conditions of occupation, blockade, and–in Gaza–the impacts of a prolonged genocidal war, experiences extreme scarcity. In practice, Palestinians in the West Bank use only about 20% of their water resources due to Israeli control over most sources, while the annual per capita share is only 130 m^3 compared to 550 m^3 for settlers.[8] In Gaza, groundwater over-extraction, siege-related infrastructure collapse, and wartime destruction have pushed the per capita share from 84.6 liters per day in 2022 to between 3 and 15 liters today, leaving 97% of water unfit for human consumption.[9]

Overall, experiences of Jordan, Lebanon, and Palestine show that water stress in the region is not driven by hydrology alone but by governance, demographic pressures, and in some cases coercive political conditions. As these forces intensify, regional water insecurity is likely to deepen unless systemic reforms and equitable access are prioritized.

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[6] Jordan Valley Authority. (2024). Annual Report for the year 2024. Jordan (Source in Arabic) https://www.mwi.gov.jo/ebv4.0/root_storage/ar/eb_list_page/.pdf

[7] Lebanon Ministry of Energy and Water. (2024). Towards a Sustainable Water Sector, National Water Sector Strategy in Lebanon 2024-2035. Lebanon. https://bdd.pseau.org/outils/ouvrages/mee_lebanon_s_national_water_strategy_2024_2035_2024_executive_summary_.pdf

[8] Palestinian Water Authority. (2024). Report on Israeli Violations in the Water Sector: Plundering Water Resources for Decades and Using Water as a Weapon Against the People. Ramallah, Palestine. https://www.pwa.ps/ar/File/15cf69y1429353Y15cf69/

[9] *Ibid.*

Daily Water Access and Sectoral Consumption Patterns

Daily household water access across the three countries falls consistently below global health standards, though to varying degrees.

In Jordan, per capita household supply ranges from 60–80 liters per day, falling to 40 liters in some areas and as low as 20–30 liters in rural zones–far below the World Health Organization (WHO)'recommended minimum of 100 liters/day. [10]

Lebanon's daily per capita share ranges between 160 liters in urban environments and just 50 liters in rural localities, reflecting severe losses in its distribution network. [11] In practice, this means that some regions of Lebanon are experiencing severe water shortages.

In Palestine, in the West Bank, per capita water uses averages around 68 liters/day, restricted by Israeli allocations and periodic supply reductions by *Mekorot*, [12] particularly in summer. For example, the water quantities agreed upon with the Israeli side–34,000 m^3/day–were reduced in practice during the summer of 2023 to less than 24,000 m^3/day. Nonetheless, Gaza's situation remains the most alarming. Even prior to October 2023, access in some areas had fallen to 20 liters/day while now, due to the destruction of desalination plants, fuel shortages, and the disabling of pumping and wastewater facilities, more than half of residents receive no more than 9 liters/day, with 2/3 not able to afford the minimum standard of drinking water of 6 liters. This is way below the minimum humanitarian threshold of 15 liters.[13]

[10]Jordan Valley Authority. (2024). Annual Report for the year 2024. Jordan (Source in Arabic) https://www.mwi.gov.jo/ebv4.0/root_storage/ar/eb_list_page/.pdf

[11] Lebanon Ministry of Energy and Water. (2024). Towards a Sustainable Water Sector, National Water Sector Strategy in Lebanon 2024-2035. Lebanon. https://bdd.pseau.org/outils/ouvrages/mee_lebanon_s_national_water_strategy_2024_2035_2024_executive_summary_.pdf

[12] *Mekorot* is the national water company of Israeli occupation and the country's top agency for water management. Founded in 1937, it supplies Israeli occupation with approx. 80% of its drinking water and operates a cross-country water supply network known as the National Water Carrier of Israel, and it is responsible for water management for Palestinians in the West Bank and in the Gaza Strip.

[13] Palestinian Water Authority. (2024). Report on Israeli Violations in the Water Sector: Plundering Water Resources for Decades and Using Water as a Weapon Against the People. Ramallah, Palestine. https://www.pwa.ps/ar/File/15cf69y1429353Y15cf69/

These access constraints are closely tied to sectoral consumption patterns. In both Jordan and Lebanon, agriculture is the dominant consumer, accounting for 52.8% and 53.4% of total water use respectively, largely due to inefficient irrigation practices. Besides, domestic use represents 43.8% in Jordan and 41% of total consumption in Lebanon where it suffers from 45% leakage, while industrial use remains small in all three contexts - around 3.4% in Jordan and 6% in Lebanon from the food industry. In Palestine, 70% of water is used for agriculture, 25% for domestic purposes, and 5% for industry. [14]

Ultimately, the three countries are suffering from increasing systemic challenges. These include their control and Israeli control over water resources, groundwater and surface water pollution from sewage and seawater intrusion; inadequate water treatment infrastructure; population pressure; wastewater in networks; lack of infrastructure; climate change; low rainfall; and excessive groundwater depletion.

II- Water Sources and Infrastructure

Water sources across Jordan, Lebanon, and Palestine include varying combinations of surface water, groundwater, treated wastewater, and desalination, though each country faces distinct constraints.

Jordan draws 27% of its supply from surface sources such as rivers, springs, and the King Abdullah Canal, on the East Bank of the of the Jordan River (325 million m^3 annually), with 167 million m^3 allocated to agriculture. Treated wastewater provides 194 million m^3 annually–more than 90% of which goes to agriculture–and groundwater extraction amounts to approximately 683 million m^3,[15] though aquifers are severely stressed and seawater desalination is still at its project design phase. Ultimately, approximately 52% of

[14] **Interview with Yaqoub Kilani** - Palestinian Ministry of Agriculture. Conducted on August 13, 2025, on *Water consumption and agricultural water quotas in Palestine.*
[15] **Interview with Imran Sawalha** - Ministry of Agriculture, Jordan. Conducted on August 11, 2025, on *Agricultural production and Water Justice in Jordan.*

Jordan's total water resources are used for agriculture,[16] amounting to nearly one billion cubic meters annually.

Lebanon's surface water system includes 13 major rivers producing roughly 1,475 million m^3 annually, alongside 2,050 million m^3 from springs and seven major dams. Yet leakage, unlicensed well-drilling (85% of wells), dam cracks such as the 2019 in the Bared Dam in North Lebanon, and declining rainfall undermine reliability.[17] Groundwater provides about 700 million m^3 - representing around 30% of the water supply -, but extraction exceeds recharge, causing depletion and salinization. Despite these large sources of water, rainfall still constitutes 70% of Lebanon's water resources, despite lowering precipitation rates.

Palestine's reliance on groundwater is substantial, especially in the West Bank, where aquifers provide 73.1% of available water (399.7 million m^3) [18] as there are no permanent rivers in either the West Bank or the Gaza Strip. However, Palestinians are allowed to use only a fraction of this potential due to Israeli restrictions. This heavy reliance is reinforced due to water resources being nearly inaccessible. Indeed, Palestinians are barred from accessing resources from the Jordan River and Lake Tiberias and cannot construct dams to store over 165 million m^3 of rainwater. Existing dams provide only about 4 million m^3 of surface water. Furthermore, in Gaza, the collapse of energy and water systems–including the halting of seawater desalination facilities and the destruction of 40% of water networks–has left the population dependent on a fraction (10–20%) of rainwater harvesting tanks and pre-war water availability, fluctuating with fuel supplies.[19]

[16] Jordan Valley Authority. (2024). Annual Report for the year 2024. Jordan (Source in Arabic) https://www.mwi.gov.jo/ebv4.0/root_storage/ar/eb_list_page/.pdf
[17] Lebanon Ministry of Energy and Water. (2024). Towards a Sustainable Water Sector, National Water Sector Strategy in Lebanon 2024-2035. Lebanon. https://bdd.pseau.org/outils/ouvrages/mee_lebanon_s_national_water_strategy_2024_2035_2024_executive_summary_.pdf
[18] Palestinian Water Authority. (2025). Report on the Escalation of Israeli Plunder of Water Resources to Implement Settlement and Forced Displacement Agendas. Ramallah, Palestine. https://www.pwa.ps/ar/File/15cbb2y1428402Y15cbb2/
[19] Palestinian Water Authority. (2024). Report on Israeli Violations in the Water Sector: Plundering Water Resources for Decades and Using Water as a Weapon Against the People. Ramallah, Palestine. https://www.pwa.ps/ar/File/15cf69y1429353Y15cf69/

Eventually, despite differing hydrological profiles, all three countries face system level strain on their surface water, groundwater, and infrastructure, underscoring the shared regional challenge of securing reliable and resilient water supplies.

III- Legislative and Policy Frameworks Regulating the Water

Across Jordan, Lebanon, and Palestine, the water sector is governed by legal and regulatory systems intended to manage scarce resources, regulate extraction, and prevent pollution– yet each country's framework is shaped by distinct political, environmental, and institutional realities.

Jordan's legislation is built around laws such as *the Water Authority Law No. 15/1988* [20] and the *Jordan Valley Authority Law No. 17/1988*, [21] which regulate groundwater and surface water extraction, manage irrigation systems, and oversee dams and agricultural water distribution while protecting resources from depletion and pollution. Amendments in 2021 strengthened penalties against water theft and illegal connections.

Lebanon, in contrast, has adopted policies such as *Water Sector Organization Law No. 221/2000* [22] declaring water a public good and regulating well-drilling to maintain both surface and groundwater sustainability, as well *as Decree No. 144/1925* [23] governing spring and river extraction and diversion of courses and ensuring state oversight of water rights and public uses.

Palestine's foundational framework is anchored in *Water Law No. 3/2002*,[24] which classifies water as public property, criminalizes unlicensed well drilling, and mandates

[20] Jordan Water Authority Law No. 15/1988. (1988). In Food and Agriculture Organization (FAO). https://faolex.fao.org/docs/pdf/jor1338Eoriginal.pdf
[21] Jordan Valley Development Law. (1988). In *Food and Agriculture Organization (FAO)*. https://faolex.fao.org/docs/pdf/jor63018E.pdf
[22] The law on the Organization of the Water Sector - Lebanon. (2000). In *Programme Solidarité Eau*. https://bdd.pseau.org/outils/ouvrages/mwe_law_no_221_date_29_05_2000_and_its_amendments_2000.pdf
[23] Lebanon *Decree No. 144/1925*. (1925). Lebanese University Legal Database. (Source in Arabic) http://legiliban.ul.edu.lb/LawView.aspx?opt=view&LawID=172254
[24] *Palestine Water Law No. 3/2002*. (2001). Official Palestinian Government Legal Portal (OGB). (Source in Arabic) https://mjr.ogb.gov.ps/Decrees/ViewText/26726/

equitable allocation among sectors such as drinking, agriculture, and industry. However, unlike Jordan and Lebanon, Palestinian water governance is heavily constrained by Israeli military restrictions rooted in the *Oslo II Accords*,[25] which limit Palestinian extraction from groundwater aquifers and require Israeli approval for nearly all water-related infrastructure development.

Besides, environmental protection and the prevention of water pollution form a central dimension of water legislation in all three contexts. Jordan's *Environmental Protection Regulation No. 6/2017* [26] designates buffer zones around wells and restricts certain industrial and agricultural activities to prevent contamination.

Similarly, Lebanon's *Environmental Protection Law No. 444/2002* [27] prohibits the discharge of industrial or untreated wastewater into the environment and establishes a fund for pollution-control projects.

Palestine's *Public Health Law No. 20/2004* [28] mandates adherence to the *World Health Organization* (WHO) drinking water standards and criminalizes the contamination of water sources by sewage or hazardous waste. In Gaza, where infrastructure collapse and groundwater depletion have worsened water quality, the *2017 Emergency Water Operational Measures* [29] has established emergency distribution mechanisms under the Water Authority and prohibits random well-drilling. Despite these efforts, enforcement remains uneven across all three areas–due to resource limitations in Jordan, institutional weaknesses in Lebanon, and occupation-related constraints in Palestine.

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[25] United Nations. *Israeli Palestinian interim Agreement on the West Bank and the Gaza Strip (a.k.a. "Oslo II") - Question of Palestine.* (1995). United Nations - Question of Palestine. https://www.un.org/unispal/document/auto-insert-185434/

[26] Jordan Environmental Protection Law of 2017. (2017). In *Food and Agriculture Organization (FAO).* https://faolex.fao.org/docs/pdf/jor173241E.pdf

[27] *Lebanon's Environmental Protection Law No. 444/2002.* (2002). Lebanese University Legal Database. (Source in Arabic) http://legiliban.ul.edu.lb/LawView.aspx?opt=view&LawID=244662

[28] Palestine Public Health Law 2004. (2004). In *Learning Partnership.* (Source in Arabic) https://learningpartnership.org/sites/default/files/resources/pdfs/Palestine-Public-Health-Law-2004.pdf

[29] In 2017, Gaza authorities and water service providers implemented emergency operational measures to cope with severe water insecurity, including fuel-supported operation of water and wastewater facilities, rationing of supply, and prioritization of critical services. However, these actions were conducted within emergency response frameworks rather than through the enactment of a standalone emergency water law.

Furthermore, all three countries also regulate agricultural water use by promoting efficient irrigation technologies, though with different capacities for implementation. Jordan's *Agriculture Law No. 13/2015* [30] and Palestine's *Agriculture Law No. 2/2003* [31] both encourage farmers to adopt modern systems such as drip and sprinkler irrigation to reduce water waste, supported in Jordan by government incentives.

Lebanon lacks an equally strong agricultural water-management law but regulates irrigation through the broader *Water Law No. 221/2000* [32] and through environmental provisions controlling surface and groundwater use. The common legislative trend across the three jurisdictions is to reduce dependence on traditional irrigation methods and curb groundwater over-extraction, which remains a shared and growing regional threat.

Additionally, institutional governance reforms–particularly the regulation of well-drilling and the restructuring of water authorities–represent another point of comparison. Jordan's *Groundwater Well Monitoring System No. 85/2002* [33] and *Lebanon's Decree No. 14438 of 1970* [34] both impose licensing requirements, depth limits, and penalties for unauthorized drilling.

Lebanon further reorganized its water sector through *Water Law No. 221/2000*,[35] which instituted four regional water establishments to improve service delivery and reduce losses. Additionally, Lebanon issued the Water Encroachment-related *Law No. 77/2018* [36]

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[30] Jordan Agriculture Law No. 13 of 2015. (2015). In *Jordan Ministry of Agriculture*. (Source in Arabic) https://www.moa.gov.jo/ebv4.0/root_storage/ar/eb_list_page/.pdf

[31] Palestine *Amended Law no. 2/2003 on Agriculture*. (2003). Climate Change Laws of the World. (Source in Arabic) https://climate-laws.org/documents/amended-law-no-2-2003-on-agriculture_6e51

[32] The law on the Organization of the Water Sector - Lebanon. (2000). In *Programme Solidarité Eau*. https://bdd.pseau.org/outils/ouvrages/mwe_law_no_221_date_29_05_2000_and_its_amendments_2000.pdf

[33] Jordan Underground water By Law 85 of 2002. (2002). In *Food and Agriculture Organization*. https://faolex.fao.org/docs/pdf/jor63017E.pdf

[34] *Lebanon's Decree No. 14438 of 1970*. (1970). Lebanese Ministry of Energy and Water. (Source in Arabic) https://energyandwater.gov.lb/ar/details/100483/

[35] The law on the Organization of the Water Sector - Lebanon. (2000). In *Programme Solidarité Eau*. https://bdd.pseau.org/outils/ouvrages/mwe_law_no_221_date_29_05_2000_and_its_amendments_2000.pdf

[36] Lebanon *Law No. 77 of 13 April 2018 – Water Law*. (2018). Lebanese University Legal Database. http://legallaw.ul.edu.lb/LawView.aspx?LawID=275497

to combat attacks on water resources and networks, criminalize water theft or illegal connections, and impose penalties for violators, including fines and imprisonment.[37]

Palestine's regulatory apparatus theoretically provides similar controls, but the implementation of well-drilling and water-infrastructure rules is severely hindered by Israeli restrictions. In practice, Palestinians cannot drill wells, expand networks, or build new water facilities in Area C[38] without Israeli permits, which are rarely granted. Besides, Israeli authorities also impose limits on the quantities Palestinians may extract and maintain unilateral control over the Jordan River basin and most shared aquifers.[39]

Altogether, the region's constrained and unevenly accessible water sources show that safeguarding supply is fundamentally tied to strengthening infrastructure and improving management practices rather than relying on natural availability alone.

IV- Water Agreements and Regional Water Relations

Water relations in Jordan, Lebanon, and Palestine are deeply shaped by shared hydrological systems, geopolitical tensions, and power asymmetries that define how water is allocated, controlled, or contested across borders. All three countries depend, to varying degrees, on transboundary water resources – particularly rivers and aquifers that traverse political boundaries – making bilateral and multilateral agreements critical for securing water access.

However, the political contexts surrounding each case differ as Jordan navigates formal treaties with neighboring states; Lebanon operates within a context of partial cooperation

[37] **Interview with Youlios (Jules) Hatem** - Water expert and consultant with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Conducted on August 07, 2025, on *Water resources and their distribution in Lebanon.*

[38] Area C, which Israel administers, covers over 60 percent of the West Bank. An estimated 300,000 Palestinians live in 532 residential areas located partially or fully in Area C, along with some 400,000 Israeli settlers residing in approximately 230 settlements. In addition, around 30% of Area C is a designated "firing zone" for military training – 38 Palestinian communities are located within these training areas. Altogether, 60% of Area C is made up of these firing zones, other military land, or state land and nature reserves. Palestinian residents struggle to obtain land permits for housing and farming in the remaining 40%.

[39] **Interview with Dr. Abdul Rahman Al-Tamimi** - Director of the Palestinian Hydrology Group, Palestine. Conducted on August 14, 2025, on *Water Justice in Palestine and the Occupied Territories.*

with Syria and persistent conflict with Israel; and Palestine faces a unique situation in which water agreements are negotiated under conditions of occupation and structural inequality. Despite these differences, the three cases collectively illustrate how *water diplomacy* in the region is shaped by asymmetrical negotiations, competing against national interests, and the absence of comprehensive basin-wide management frameworks.

Jordan's experience reflects both prompted formalized cooperation to secure its share of water and chronic vulnerability to upstream decisions by neighboring states. The cornerstone of Jordan's *water diplomacy* is the *1994 Jordan–Israel Peace Treaty* (Wadi Araba Agreement), [40] which established detailed water-sharing arrangements involving the Yarmouk River, [41] the Jordan River system, groundwater in Wadi Araba, and seasonal water transfers from Lake Tiberias across the border. Under the treaty, Israel is entitled to 25 million m^3 of Yarmouk River water in summer, while Jordan receives an estimated 40–50 million m^3 annually and is permitted to pump 20 million m^3 from Lake Tiberias in winter. The agreement also acknowledges Jordan's right to 10 million m^3 from groundwater sources in the Southern Valley.[42] Importantly, the Agreement has opened the door for joint projects such as dams and desalination initiatives, including the proposed Red–Dead "Peace Port" project in Aqaba. [43]

[40] United Nations. Treaty of Peace Between the State of Israel and The Hashemite Kingdom of Jordan. (1994). In *United Nations*. https://peacemaker.un.org/sites/default/files/document/files/2024/05/il20jo941026peacetreatyisraeljordan.pdf

[41] The Yarmouk River is the largest tributary of the Jordan River. It runs in Jordan, Syria and Israeli occupation, and drains much of the Hauran plateau.

[42] **Interview with Dr. Duraid Mahasneh** - Water Expert and Chairman of the Board of Directors of the Idama Association for Energy, Water and Environment, Jordan. Conducted on August 11, 2025, on *Water agreements in Jordan.*

[43] The Red Sea–Dead Sea (Red–Dead) Project, often linked to the "Peace Port" vision, was formally advanced in 2013 through agreements between Jordan, Israel, and the Palestinian Authority, following earlier World Bank–led feasibility studies launched in 2005. The project aimed to desalinate Red Sea water near Aqaba, supply drinking water mainly to Jordan (with allocations to Israel and Palestine), and transfer brine northward to help stabilize the rapidly declining Dead Sea. Initial cost estimates ranged between US$10–11 billion for the full-scale conveyance, though later scaled-down phases were projected at around US$1–2 billion. Despite memoranda of understanding and tender discussions, the large-scale project has not been completed and has been repeatedly postponed, with Jordan officially moving away from the joint plan in 2021 in favor of alternative desalination projects. As of today, the original trilateral Red–Dead conveyance remains unimplemented, though related bilateral water–energy cooperation discussions continue intermittently.

Beyond Israel, Jordan's regional water relations also extend to Syria, with the *1987 Agreement on the Unity Dam*,[44] which grants Jordan 75% of the dam's 110 million m^3 storage capacity on the Yarmouk River. In practice, however, Jordan rarely receives its full share of the River due to Syria's unilateral construction of multiple upstream dams which reduces the water flow to Jordan.

Additionally, Jordan's cooperation with Saudi Arabia is shaped by the *2015 Disi Water Agreement*, [45] which regulates extraction from the shared non-renewable Disi aquifer and ensures the transfer of 50 million m^3 of water annually to Saudi Arabia for 25 years, in exchange for Saudi investment in Jordanian desalination and infrastructure projects in Aqaba, in the Red Sea.[46] Taken together, these agreements highlight Jordan's heavy reliance on regional diplomacy to compensate for severe domestic scarcity and limited renewable water resources.

In the Lebanese case, Lebanon's transboundary water relations also revolve around the management of shared rivers, though they are shaped as much by historical political tensions as by hydrological realities. Unlike Jordan, Lebanon has no peace treaty with Israel and refuses to enter direct negotiations due to ongoing conflict, occupation, and repeated violations of Lebanese sovereignty. Despite being relatively water-rich, Lebanon's major transboundary interactions concern the Hasbani and Wazzani rivers,[47] shared with

[44] Agreement concerning the Utilization of the Yarmuk Waters (with annex). signed at Amman on 3 September 1987. (1987). In *International Water Law*. https://www.internationalwaterlaw.org/documents/regionaldocs/Jordan-Syria-1987.pdf

[45] Agreement between the Government of the Hashemite Kingdom of Jordan and the Government of the Kingdom of Saudi Arabia for the management and utilization of the ground waters in the Al-SAg/Al-DiSI layer. (2015). In *International Water Law*. https://www.internationalwaterlaw.org/documents/regionaldocs/Disi_Aquifer_Agreement-English2015.pdf
The Disi Water Conveyance Project is in southern Jordan and transports groundwater from the Disi aquifer, which lies near the Jordan–Saudi Arabia border, to Amman and northern population centers. The aquifer's water is pumped through a pipeline of about 325 km to help meet domestic and municipal water demand in Jordan's capital and surrounding areas, supplementing scarce surface water resources.

[46] **Interview with Ahmed Bali** - Ministry of Water and Irrigation, Jordan. Conducted on August 4, 2025, on *Water resources and quotas in Jordan.*

[47] The Hasbani River originates in southern Lebanon, near the town of Hasbaya at the foot of Mount Hermon and flows south for approximately 65 km before crossing into northern Israeli occupation, where it joins the Banias and Dan rivers to form the upper Jordan River. The Wazzani River is a major tributary of the Hasbani; it rises from the Wazzani Springs near the Lebanese village of Al-Wazzani, close to the Blue Line (Lebanon–Israel boundary), and runs for about 4–5 km before merging with the Hasbani. Both rivers are hydrologically significant components of the Jordan River Basin and have been politically sensitive due to their transboundary location between Lebanon and Israel.

Syria and exploited downstream by Israel. The *1994 Lebanon–Syria Agreement* [48] allocates 4 million m^3 annually to Lebanon from the Hasbani River, while granting Syria a share from the Wazzani spring. Yet the absence of a robust monitoring and enforcement mechanism has led to recurring disputes, with Lebanon accusing Syria of exceeding agreed withdrawal limits.

Lebanon's most significant assertion of Water Rights is linked to the Litani River, [49] whose full sovereignty was reaffirmed through *the 1950 Lebanon–Syria Agreement*, preventing Syria from claiming any share. Nevertheless, Israel's diversion of waters from the Hasbani and Wazzani rivers downstream remains a source of tension, especially as these waters flow into Israeli territory and feed into larger regional water systems. Because Lebanon rejects direct negotiation with Israel, disputes remain unresolved and are managed through diplomatic statements, indirect mediation, or UN mechanisms rather than formal bilateral agreements. This situation reflects a broader regional pattern in which political conflict constrains the development of equitable and cooperative water-sharing frameworks.

In contrast to Jordan and Lebanon, Palestine's water relations are characterized by structural asymmetry under occupation, where agreements are framed not as cooperative arrangements but as instruments that reinforce control. The most consequential of these agreements is the *1995 Oslo II Accords*,[50] particularly the Water Annex, which codified an unequal division of the Mountain Aquifer.[51] In theory, Palestinians were to be allocated 118

[48] Agreement between Lebanon and Syria on the Distribution of the Water of the Al-Assi (Orontes) River Rising in Lebanon. (1994). In *Ecolex*. http://www2.ecolex.org/server2neu.php/libcat/docs/TRE/Full/Other/TRE-149319.pdf

[49] The Litani River is the longest river entirely within Lebanon, stretching approximately 170 km from its source in the fertile Beqaa Valley, west of Baalbek, to its mouth at the Mediterranean Sea north of the city of Tyre (Sour). Unlike the Hasbani, it does not cross international borders, making it Lebanon's only major river fully under national sovereignty. Due to its economic importance and location near the Israeli occupation border in its lower reaches, the river has also held strategic and political significance in regional water discussions.

[50] United Nations. *Israeli Palestinian interim Agreement on the West Bank and the Gaza Strip (a.k.a. "Oslo II") - Question of Palestine.* (1995). United Nations - Question of Palestine. https://www.un.org/unispal/document/auto-insert-185434/

[51] The Mountain Aquifer is the principal groundwater basin underlying the West Bank highlands, extending beneath the central mountainous ridge that runs north–south from Jenin and Nablus through Ramallah and Jerusalem to Hebron. Hydrologically, it is divided into three main sub-basins: the Western Aquifer Basin (flowing westward toward Israel and the Mediterranean), the North-Eastern Basin (toward the Jezreel/Beisan Valley), and the Eastern Basin (toward the Jordan Valley and the Dead Sea). Although most of its recharge area lies within the West Bank, significant portions of the water flow across the Green Line, making it a transboundary aquifer shared between Palestine and Israel.

million m^3 of water per year, while Israel retained access to roughly 80% of the shared groundwater. The agreement also established the *Joint Water Committee*, ostensibly a mechanism for cooperative management but, in practice, one dominated by Israeli veto power. In practice, every major Palestinian water project–including well drilling, network expansion, and inter-regional water transfer–requires Israeli approval, while Israel conducts its own projects without needing Palestinian consent.

Oslo II through its *Item 40*, notably excluded the Jordan River as a source of water, denying Palestinians access to what should have been an allocation of 250–270 million m^3 annually. As a result, Palestinians today receive none of this water. These structural constraints have entrenched Palestinian dependence on Israel, with water purchases rising from 20 million m^3 annually at the start of the 1993 Palestinian Authority's mandate to approximately 100 million m^3 today. Meanwhile, Israeli settlement expansion has been facilitated by increased diversion of West Bank water to settlements. The *Accords*, contractually supposed to end in 1999 used the distinction between water sources and services for the control of resources to remain under the authority of the Israeli occupation.

Furthermore, Israeli development of large-scale desalination compounds this dependency. Israel currently owns twelve desalination plants–four operating, four under construction, and four planned–which are projected to create a surplus of 400 million m^3 by 2026. While marketed as a potential source for supplying Palestinians and Jordanians, these surplus risks deepening political and economic dependency rather than promoting equitable water access, especially given the high cost of desalinated water–up to 12 shekels/m^3 (around 4 US$) for areas around Jenin, in the North of the West Bank. Additionally, the Oslo framework's mandated relationship between Palestinian institutions and Israel's *Mekorot* water company reinforces a system in which the occupying power maintains commercial and infrastructural control. [52]

[52] **Interview with Dr. Abdul Rahman Al-Tamimi** - Director of the Palestinian Hydrology Group, Palestine. Conducted on August 14, 2025, on *Water Justice in Palestine and the Occupied Territories.*

Beyond Israel, Palestine also pursued limited regional cooperation with other countries. The *2017 Understanding with Egypt* [53] aimed to supply Gaza with 10 million m^3 annually from the El-Arish station, in Sinai, and includes plans for a joint desalination plant in Rafah, at the joint border. However, the agreement remains largely unimplemented due to political instability, border closures, and the ongoing humanitarian crisis in Gaza.

Taken together, the three cases demonstrate how water agreements in the region range from formal treaties (Jordan–Israel), to partial bilateral arrangements (Lebanon–Syria), to deeply unequal arrangements imposed under conditions of occupation (Palestine–Israel). They also reveal shared challenges: upstream diversions that reduce downstream flows, weak enforcement mechanisms, and the absence of integrated basin governance for key shared rivers such as the Jordan River, Yarmouk River, Hasbani Rivers, and Wazzani Rivers.

Consequently, *water diplomacy* in Jordan, Lebanon, and Palestine thus operates in a landscape where hydrology [54] intersects directly with politics, security, and sovereignty, making the water issue one of the most prominent strategic challenges in the Arab Levant. Any movement toward *water justice* will require addressing structural inequalities–particularly in Palestine's case–while advancing cooperative frameworks that recognize shared rights, establish transparent monitoring systems, and promote equitable allocation based on international water law.

V- Climate Change and Its Impact on Water Resources

Climate change has emerged as one of the most decisive forces shaping water security across Jordan, Lebanon, and Palestine. Although each country experiences its own set of challenges rooted in geography, politics, and governance, all three face declining rainfall, rising temperatures, increasing evaporation, irregular seasons, and heightened

[53] *Electricity crisis in the Gaza Strip*. (2025, November 19). Wikipedia. https://en.wikipedia.org/wiki/Electricity_crisis_in_the_Gaza_Strip?

[54] Hydrology is the branch of science concerned with the properties of the earth's water, and especially its movement in relation to land

hydrological instability. These shifts are being combined with pre-existing vulnerabilities–such as over-extraction, limited infrastructure, population pressures, and political constraints–to produce water crises that are deepening at a rate that exceeds institutional and financial capacities. Despite differences in the scale and sources of pressure, Jordan, Lebanon, and Palestine are now experiencing converging threats to water quantity, quality, and equitable access.

Across the region, rainfall patterns have become increasingly erratic, with all three countries reporting declines of 10–20% in average precipitation over recent decades. This has reduced groundwater recharge and accelerated soil and aquifer depletion, particularly in shared basins. Jordan has witnessed a 20% drop in rainfall over the past thirty years, sharply reducing infiltration rates and limiting natural replenishment of its already overstressed aquifers.[55] Lebanon, long considered water-rich, is now similarly affected as reduced snowpack and irregular rainfall undermine the recharge cycles of its mountain springs and wetlands. As an example, the Zarqa Sprint in the Bekaa Valley has dried up to the extent of disappearing completely. Palestine, especially the West Bank, has also experienced a sustained 10–15% decline in precipitation, [56] contributing to declining flows in springs and lower yields from the Mountain Aquifer.

These hydrological changes have been incorporated with rising temperatures–reported in all three countries–to intensify evaporation from rivers, reservoirs, and agricultural lands. For example, Jordan has documented evaporation increases of up to 15% since the early 2000s impacting crops and growing demand for irrigation water, [57] while Lebanese and Palestinian farmers increasingly struggle with accelerated soil drying and crop stress.

Additionally, in all three contexts, extreme weather events are becoming more frequent and destructive, undermining water quality and contributing to public health risks. Flash

[55] UNICEF Jordan. (2022). Water Stress in Jordan: The Economic and Social Costs of Water Stress in Jordan and Opportunities to Address the Crisis. https://www.unicef.org/jordan/reports/water-stress-jordan-report

[56] **Interview with Yaqoub Kilani** - Palestinian Ministry of Agriculture. Conducted on August 13, 2025, on *Water consumption and agricultural water quotas in Palestine.*

[57] **Interview with Ahmed Bali** - Ministry of Water and Irrigation, Jordan. Conducted on August 4, 2025, on *Water resources and quotas in Jordan.*

floods, a rising threat across the Levant, now regularly damage water networks and contaminate surface sources. Jordan, although less prone to flash floods, has experienced prolonged, severe droughts–three major ones between 2010 and 2023 [58]–which drastically reduced flows from the Yarmouk River to less than half their historical average. Lebanon has faced a similar pattern, with major floods in 2018 and 2022 that overwhelmed water infrastructure and contaminated wells and streams. This devastation was increased by forest fires in 2020 and 2021, destroying vital vegetation and protecting water resources. [59] Palestine experienced such events in Gaza in 2020, during which floodwaters mixed with sewage, accelerating the collapse of an already fragile water system. [60] These climatic shocks expose the structural weaknesses of water management institutions and underscore the region's collective vulnerability to episodic climate extremes.

Furthermore, although its severity varies significantly, water quality deterioration is another common crisis linking the three countries. Jordan, though less polluted, struggles with water-quality degradation resulting from declining flows, rising temperatures, industrial discharges, and overuse of marginal-quality water for irrigation. Lebanon is experiencing its own quality crisis, driven by untreated wastewater discharge, improper pesticide use, and groundwater contamination. Recent tests in several Lebanese regions show that around 70% of drinking water samples contain dangerous bacteria.[61] Palestine faces the most acute conditions, particularly in the Gaza Strip, where 97% of water is now unfit for human consumption due to high levels of nitrates, salinity, and chloride contamination.[62] Besides, its coastal aquifer is being depleted at twice its natural recharge rate. Salinity levels have reached 1,500 mg/L–six times the safe limit of 250 mg/L–posing

[58] *Ibid.*
[59] **Interview with Youlios (Jules) Hatem** - Water expert and consultant with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Conducted on August 07, 2025, on *Water resources and their distribution in Lebanon.*
[60] **Interview with Yaqoub Kilani** - Palestinian Ministry of Agriculture. Conducted on August 13, 2025, on *Water consumption and agricultural water quotas in Palestine.*
[61] **Interview with Youlios (Jules) Hatem** - Water expert and consultant with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Conducted on August 07, 2025, on *Water resources and their distribution in Lebanon.*
[62] Palestinian Water Authority. (2023). Water Resources Data https://www.pwa.ps/ar/Article/7155/

existential risks to public health and agricultural production. [63] Across all three countries, deteriorating water quality is reducing the availability of potable water, increasing dependence on expensive alternative sources, and exacerbating inequalities in access.

Moreover, the agricultural sector–historically a backbone of rural livelihoods–is bearing the brunt of climate-induced water stress. Jordan has lost nearly 30% of its fertile land to drought-related degradation, and rationing has forced farmers to reduce cultivated areas and shift to less water-intensive crops, while some domestic networks have been constrained to operate only in certain days of the week. [64]

Lebanon's agricultural production has similarly declined, with farmers increasingly abandoning water-demanding vegetables in favor of wheat and other lower-water alternatives. In Palestine, agricultural decline is even more pronounced as irrigated land in Gaza has shrunk by 50% since 2007, and crop yields in both the West Bank and Gaza have fallen sharply due to water scarcity, salinity, and extreme heat. [65] For all three countries, reduced agricultural output is directly impacting food security, rural employment, and the resilience of vulnerable communities.

Also, domestic and industrial sectors are experiencing cross-cutting pressures. In As a result, Jordan, water networks deliver supply intermittently–often only a few days per week–while per-capita availability has plummeted from 3,600 m^3 per year in 1946 to less than 100 m^3 today, one of the lowest in the world.[66] Besides, in some regions, daily per-capita shares have dropped below 40 liters, far below global minimum standards.

Lebanon, once relatively stable in household supply, now faces frequent water outages lasting weeks, particularly in Beirut and the South, pushing residents toward expensive

[63] **Interview with Yaqoub Kilani** - Palestinian Ministry of Agriculture. Conducted on August 13, 2025, on *Water consumption and agricultural water quotas in Palestine.*
[64] **Interview with Ahmed Bali** - Ministry of Water and Irrigation, Jordan. Conducted on August 4, 2025, on *Water resources and quotas in Jordan.*
[65] Palestinian Water Authority. (2024). Report on Israeli Violations in the Water Sector: Plundering Water Resources for Decades and Using Water as a Weapon Against the People. Ramallah, Palestine. https://www.pwa.ps/ar/File/15cf69y1429353Y15cf69/
[66] UNICEF Jordan. (2022). Water Stress in Jordan: The Economic and Social Costs of Water Stress in Jordan and Opportunities to Address the Crisis. https://www.unicef.org/jordan/reports/water-stress-jordan-report

private tankers. The industrial sector across Lebanon and Jordan has seen rising production costs due to the need to secure treated or desalinated water.

Meanwhile, Palestinian households continue to face chronic shortages–averaging only 73 liters per capita per day in the West Bank–far below the WHO recommendation of 100 liters. [67] In Gaza, shortages are catastrophic, with most households relying on informal desalination units that often fail to meet safety standards. Thus, in all three settings, water scarcity is not only an environmental problem but an economic and social one, deepening inequalities and straining already fragile public services.

Finally, population pressures further amplify regional vulnerabilities. Jordan's water system is further stressed by the presence of approximately 1.3 million Syrian refugees and increasing number of unregistered refugees, which has raised national water demand by about 20% and placed severe pressure on northern governorates such as Irbid and Mafraq.[68] Similarly, Lebanon, hosts one of the highest refugee populations per capita in the world, including also unregistered refugees not covered by official data, adding additional stress to water distribution systems already weakened by the economic crisis. Palestine's demographic pressures–particularly in Gaza, one of the most densely populated areas on the planet–intensify the rate at which water resources are depleted, contaminated, or rendered inaccessible.

Despite these shared patterns, the political and structural dimensions of water insecurity differ in important ways. Jordan's water scarcity is primarily climatic and resource-based, compounded by the burden of displaced populations and its reliance on transboundary rivers whose flows have decreased due to drought and upstream interventions. Lebanon's crisis stems from a combination of climate impacts, governance failures, pollution, and infrastructural collapse, turning a historically water-rich country into one with chronic

[67] Palestinian Water Authority. (2024). Report on Israeli Violations in the Water Sector: Plundering Water Resources for Decades and Using Water as a Weapon Against the People. Ramallah, Palestine. https://www.pwa.ps/ar/File/15cf69y1429353Y15cf69/

[68] UNICEF Jordan. (2022). *Water stress in Jordan: The economic and social costs of water stress in Jordan and opportunities to address the crisis.* Jordan. https://www.unicef.org/jordan/reports/water-stress-jordan-report

shortages. Palestine's water crisis, while also environmental, is fundamentally shaped by occupation, structural restrictions, and unequal water allocation, which severely limit Palestinian capacity to adapt to climate change or manage resources independently.

Together, these three cases illustrate a region in which climate change interacts with political constraints, institutional weaknesses, and socioeconomic pressures to create a multilayered water crisis. Jordan, Lebanon, and Palestine share common vulnerabilities but confront them within vastly different political and governance contexts. Understanding these shared challenges–while recognizing their distinct national manifestations–is essential for designing regional water-diplomacy frameworks, advancing water justice, and developing cooperative adaptation strategies capable of addressing the accelerating impacts of climate change across the Levant.

VI- Water Justice

Water justice across Jordan, Lebanon, and Palestine reflects the intersection of resource scarcity, governance structures, political constraints, and socioeconomic inequalities. Despite stark differences in political systems and levels of sovereignty, the three countries face parallel challenges in delivering equitable, accessible, and safe water to their populations. Across all contexts, *water justice* is defined not only by affordability and availability but also by the transparency of water policies, public participation in decision-making, and fair distribution across regions and social groups. Yet in each country, a combination of structural limitations and governance gaps undermines the realization of these principles.

In Jordan, water justice is shaped by the country's reliance on a billing system and a tariff structure designed to balance resource protection with socioeconomic realities. Households receive water through a block tariff system in which the first consumption tier–covering roughly 50–90% of the population–is heavily subsidized, reflecting the state's commitment to protecting low-income households through a relatively reasonable

water resources management compared to other Arab countries, despite rising water production costs. Above certain consumption thresholds, prices increase to discourage waste and better reflect the actual cost of water provision, including wastewater treatment, which alone accounts for around 0.60 Jordanian dinars per m3.[69]

Meanwhile, the agricultural and industrial sectors are governed by different pricing schemes as farmers receive up to 150,000 m3 of groundwater annually free of charge before paying modest fees, whereas industries pay a uniform rate starting at 0.5 dinars per cubic meter with no free quota. There are also government wells whose water is sold at a rate of a ¼ dinar per cubic meter, such as those supplying universities. These disparities reflect sectoral priorities but also generate tensions around the fair distribution of limited water resources. The intersection of water, agriculture, and energy adds complexity, revealing the need for a more integrated institutional framework capable of navigating cross-sectoral trade-offs collectively. [70]

While Jordan maintains some level of state-supported equity relative to regional peers, persistent gaps—especially in rural and drought-affected areas—highlight the fragility of water justice in a context defined by scarcity, refugee pressures, and rising costs. At a deeper level, these challenges reflect the lack of connection between access to basic services, such as water, and fundamental human rights. [71]

Lebanon presents a contrasting picture in which water justice is profoundly compromised by governance failures, uneven resource distribution, limited citizen influence and participation in decision-making, and the state's inability to ensure reliable access. Unlike Jordan's block-rate system, Lebanon relies predominantly on a flat-rate tariff [72]—one that

[69] **Interview with Ahmed Bali** - Ministry of Water and Irrigation, Jordan. Conducted on August 4, 2025, on *Water resources and quotas in Jordan.*
[70] *Ibid.*
[71] **Interview with Farah Atiyat** - Journalist specializing in environmental affairs and climate justice, Jordan. Conducted on August 14, 2025, on *the role of the media and water justice.*
[72] In this context, a flat-rate tariff means that households pay a fixed annual (or semi-annual) fee for water service regardless of how much water they consume. The charge is usually based on a standard subscription category rather than on metered usage. This means a household that consumes a small amount of water pays the same as one that consumes much more, and the tariff does not accurately reflect either real consumption levels or the actual cost of producing and delivering water.

does not reflect actual consumption nor the cost of water service provision. Compounding this is the irregularity of the water supply. Indeed, many areas experience prolonged outages, forcing households to rely on private water tankers whose prices fluctuate seasonally and disproportionately burden the poor. In some regions, a single tanker can cost between $50 and $100, consuming up to 10% of a family's monthly income.[73] Meanwhile, wealthier households often bypass public networks entirely by drilling their own wells–legally or semi-legally–creating a parallel water market that reinforces class-based disparities.

Besides, pollution further deepens inequity. Even when water is physically available, industrial effluents, agricultural runoff, and untreated sewage contaminate rivers and aquifers, making them unsafe to use. These cumulative failures expose structural flaws in governance, where overlapping authorities, weak enforcement, and pervasive corruption prevent coherent policy implementation. On top of this, the absence of citizen participation in water decision-making–combined with political favoritism and regional marginalization–creates an environment in which water injustice participates further in social fragility, political alienation, and the risk of local conflict.

In conclusion, in Lebanon, a strong connection can be drawn between societal crises and the state of basic water infrastructure, which serves as a cornerstone of life in communities. Among communities such as the Bedouin, pastoralists, and rural farmers, the collapse of water access has led to forced migration, economic collapse, and the erosion of traditional livelihoods. [74]

Eventually, Palestine represents an exceptional and more severe case, where *water justice* cannot be separated from the realities of occupation, asymmetric control over resources, and the structural inequalities embedded in the *Oslo II Arrangements*. Unlike Jordan and Lebanon, where national governments retain legal authority over resource allocation,

[73] **Interview with Dana Abi Ghanem** - Research Track Director at the Arab Reform Initiative, Lebanon. Conducted on August 13, 2025, on *Water and social justice in Lebanon.*
[74] *Ibid.*

Palestinians lack sovereignty over their water resources, with Israel controlling extraction, distribution, infrastructure permits, and pricing of water sold to Palestinian communities. This results in deep inequities not only between Israelis and Palestinians but also among Palestinian regions themselves. The stark disparity is further exacerbated by income differences.

While average Israeli annual incomes around $40,000 and Palestinian incomes around $5,000–$6,000, identical tariffs impose vastly unequal burdens. [75] At the core of the issue is the price Palestinians pay for water purchased from *Mekorot*, Israel's national water company. For instance, the cost per cubic meter ranges from 2.943 to 3.708 shekels (between $0.95 and $1.2), depending on the total purchased volume, and can exceed 4 shekels after operational expenses–surpassing the selling price to local authorities of 2.6 shekels per m3.[76] Although a government subsidy theoretically reduces costs for municipalities, as it is designed to lower water procurement costs and ease municipal budgets, the support is neither transparent nor consistently reported – as in it does not appear in official budgets or available data –, creating further financial strain. By late 2024, Palestinian local authorities accumulated over 1.8 billion shekels (around $577.1 million USD) in water-related debt, reflecting the structural mismatch between resource access, financial capabilities, and political constraints. [77]

Consequently, *water justice* in Palestine centers not on tariff reform or distribution equity, but on the broader struggle for sovereignty, autonomy, and unfettered access to essential resources. Besides, it also relies on Israeli occupation policies and control over Palestinian lands, which limit the possibility of developing an integrated national water system that ensures justice in the management and distribution of water resources.

[75] Palestinian Water Authority. (2025). Report on the Escalation of Israeli Plunder of Water Resources to Implement Settlement and Forced Displacement Agendas. Ramallah, Palestine.
[76] *Ibid.*
[77] **Interview with Dr. Abdul Rahman Al-Tamimi** - Director of the Palestinian Hydrology Group, Palestine. Conducted on August 14, 2025, on *Water Justice in Palestine and the Occupied Territories.*

VII- Regional Dimensions of Water Justice

Despite their differing circumstances, Jordan, Lebanon, and Palestine share several overarching challenges that define water justice across the region.

First, each country struggles with uneven access across geographic and socioeconomic lines. In all three countries, rural and marginalized communities consistently receive lower-quality services, face higher costs, and endure longer disruptions.

Second, tariff structures in all three settings are insufficiently aligned with actual costs, leaving service providers financially weak, and populations vulnerable to price volatility or supply shortages.

Third, governance fragmentation—whether due to cross-sectoral disconnects in Jordan, institutional complexity in Lebanon, or occupation-imposed restrictions in Palestine—undermines the development of equitable water systems.

Fourth, the absence or weakness of participatory decision-making across all three contexts limits accountability and public trust, reducing the legitimacy of water policies and hampering efforts to reform them.

Finally, the social consequences of water injustice reverberate across political, economic, and security spheres in all three countries. In Jordan, inadequate access to affordable water contributes to rural poverty, pushes farmers out of agriculture, and reinforces dependency on state subsidies. In Lebanon, inequitable distribution deepens sectarian divisions and fosters reliance on political patronage, with communities turning to local power brokers rather than state institutions to secure basic services. In Palestine, water injustice reinforces the broader political reality of unequal rights and limited sovereignty, suppressing economic development and perpetuating humanitarian dependence. Across all three countries, water injustice not only undermines everyday well-being but also fuels social tensions, erodes trust in institutions, and threatens long-term stability.

Ultimately, achieving *water justice* in Jordan, Lebanon, and Palestine requires addressing both technical and structural barriers: reforming tariff systems, expanding safe water access, investing in infrastructure, improving governance transparency, and–in the Palestinian case–removing the political restrictions that prevent equitable resource management. Without such changes, water injustice will continue to shape social vulnerabilities, restrict economic opportunity, and hinder any durable vision of water diplomacy or regional cooperation.

VIII- Cross-cutting Challenges across the Region

Ultimately, across Jordan, Lebanon, and Palestine, achieving *water justice* through *water diplomacy* is hindered by a combination of political, institutional, environmental, and financial constraints that reinforce one another and limit the effectiveness of regional cooperation.

A major cross-cutting challenge is the persistent lack of cooperation with neighboring states–particularly Israel and, to a lesser degree, Syria–which shapes the upstream-downstream dynamics and restricts the ability of these countries to secure equitable water allocations. In practice, in Jordan, the refusal of Israel and Syria to engage constructively on shared water basins limits the country's ability to negotiate fair distribution and may force reliance on external diplomatic pressure or sanctions. Lebanon faces parallel struggles, especially regarding the Hasbani and Wazzani rivers in the south and inequitable water sharing with Syria over the Orontes River, which further exacerbates the fragility of water management at the regional level. For Palestine, the challenge is even more fundamental as Israel's refusal to negotiate any agreement granting Palestinians full water sovereignty places structural limits on all diplomatic pathways and keeps Palestinians dependent on an imposed and highly unequal water regime. Collectively, the three countries operate in an environment where diplomacy is constrained not by technical disagreements but by entrenched political asymmetries that prevent equitable negotiation.

Institutional fragmentation is another shared barrier that weakens the capacity of Jordan, Lebanon, and Palestine to effectively use diplomacy as a tool for achieving *water justice*. In Jordan, overlapping mandates between ministries–such as Agriculture, Water, and Environment–slow decision-making and weaken the strict implementation of national water policies and enforcement mechanisms. These political complexities require for Jordan to adopt the principle of 'water for peace', as implemented in the Jordan River Agreements. Lebanon faces deep structural governance problems marked by poor coordination between the Ministry of Energy, local municipalities, and regional water establishments, leading to inconsistent regulation and ineffective planning. In Palestine, inadequate coordination between the West Bank and the Gaza Strip prevents the development of unified water strategies and complicates any diplomatic engagement with external actors. In all three countries, institutional fragmentation reduces credibility in negotiations, limits the ability to present unified national positions, and undermines the implementation of any diplomatic agreements that may be reached.

A further common obstacle is weak enforcement of water laws and the widespread presence of unregulated water extraction. Jordan continues to struggle with thousands of unlicensed wells and a high rate of non-revenue water–about 50%–driven by leakage and illegal connections.[78] Lebanon faces similar issues, with uncontrolled well drilling and lax enforcement contributing to groundwater depletion. While Palestine's regulatory capacity is heavily constrained by the political context, internal governance challenges still hinder effective enforcement. These issues undermine trust among citizens, weaken national water systems, and complicate diplomatic efforts by making it difficult to commit to or enforce shared resource rules.

Financial constraints also play a significant role in limiting diplomatic and policy options across the three countries. Jordan faces chronic funding shortages for infrastructure repair

[78] **Interview with Ahmed Bali** - Ministry of Water and Irrigation, Jordan. Conducted on August 4, 2025, on *Water resources and quotas in Jordan.*

and desalination, requiring external financing such as the *Green Climate Fund*.[79] Since 2019, Lebanon's financial collapse has severely limited its ability to invest in water treatment, storage, or monitoring systems, making it difficult to participate in regional water initiatives from a position of capability. Palestine encounters additional challenges as its political instability limits access to international funds, while infrastructure projects are frequently delayed or blocked due to external restrictions. Without adequate financial resources, the three countries face structural limitations in negotiating new water arrangements or meeting the technical conditions required for regional agreements.

Finally, climate change presents an overarching and rapidly intensifying challenge across all three contexts. Jordan is projected to face even more severe water scarcity by 2030, increasing the urgency of regional cooperation even as political obstacles constrain it. Lebanon is experiencing declining groundwater recharge and increased pollution pressures, while Palestine faces heightened variability in rainfall and increasing stress on an already restricted supply. As climate impacts intensify, the gap between water availability and water needs will widen, placing additional pressure on already fragile diplomatic relationships and making it more difficult to achieve water justice without strong, cooperative, and resilient regional frameworks.

Together, these interconnected political, institutional, financial, and environmental challenges create a landscape in which water diplomacy is both urgently needed and extremely difficult to implement. Without substantial reforms, improved coordination, and a shift toward equitable cross-border engagement, Jordan, Lebanon, and Palestine will continue to face major obstacles in translating water diplomacy efforts into meaningful water justice outcomes.

[79] https://www.greenclimate.fund/ The Green Climate Fund (GCF) is the world's largest dedicated multilateral climate fund, established in 2010 by the United Nations Framework Convention on Climate Change (UNFCCC) to channel financial resources from developed to developing countries for transformative climate action. Operating as a critical mechanism for the Paris Agreement, it aims to support developing nations in achieving low-emission and climate-resilient development pathways by investing equally in mitigation and adaptation projects–such as renewable energy, climate-resilient infrastructure, and sustainable forest management–through flexible instruments including grants, loans, equity, and guarantees.

IX- General Recommendations

Achieving water justice in Jordan, Lebanon, and Palestine requires a comprehensive, integrated approach combining political, legal, financial, technical, and social interventions. Water scarcity, climate change, institutional fragmentation, and geopolitical constraints make unilateral measures insufficient. The following recommendations synthesize country-specific insights into a region-wide strategy for strengthening governance, protecting water rights, and mobilizing collective action.

1. *Strengthen national and international political and legal frameworks for water justice.*

Embed water diplomacy principles, such as "water for peace," in national policies and ensure that new initiatives explicitly address equity and climate resilience.

Jordan's experience emphasizes integrating these principles notably in its policy of the *Future Water Area.*[80] In practice, it should amend and renegotiate some of its treaties with neighboring countries to obligate them to commit to what has been agreed. In the meantime, it could establish a 'regional water alliance' with countries such as Iraq and Egypt to exchange expertise and leverage international organizations such as the FAO to benefit from programs to ensure further sustainability. Lebanon highlights a unified Arab strategy to engage the UN and invoke international water law to pressure its neighbors and implement further joints projects with Jordan and Palestine to manage the Jordan River Basin and the financing of desalination projects in partnership with Gulf States. Palestine stresses a rights-based legal approach recognizing sovereignty over shared water resources through for instance an economic boycott of Israeli companies such as *Mekorot* and supporting further local alternatives through Palestinian municipal water associations to

[80] This Policy not yet adopted, and public was mentioned during the **Interview with Dr. Duraid Mahasneh** - Water Expert and Chairman of the Board of Directors of the Idama Association for Energy, Water and Environment, Jordan. Conducted on August 11, 2025, on *Water agreements in Jordan.*

promote local self-sufficiency. Regionally, adopt a common Arab legal position grounded in the *UN Watercourses Convention* (1997) [81] that Lebanon has not yet ratified; *UN Transboundary Waters Convention (1992)*,[82] *International Covenant on Economic, Social and Cultural Rights* (1966),[83] Geneva Conventions, and relevant UN resolutions to reinforce claims of equitable utilization and counter unilateral restrictions.

2. *Consolidate institutional coordination and governance*

Clarify mandates, reduce fragmentation, and establish unified national authorities capable of planning, regulating, and representing their countries in regional negotiations. [84]

Jordan faces overlapping ministry mandates, Lebanon struggles with poor inter-ministerial coordination, and Palestine suffers from multiple agencies managing water inefficiently. Strengthening unified institutions to manage both agricultural and drinking water, can better manage donor support, implement long-term strategies, and align plans with climate adaptation priorities.

3. *Enhance climate resilience and sustainability*

Expand water-harvesting systems, diversify water sources, and invest in technologies like desalination and renewable energy-linked water projects.

Jordan needs to develop its water-harvesting technologies, including wells, earth dams and other related systems Lebanon calls for a technical working group on climate adaptation, food, and water security with projects aimed at safeguarding future generation. Meanwhile Palestine needs urgent rehabilitation of water and sanitation

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[81] United Nations. Convention on the Law of the Non-navigational Uses of International Watercourses. (1997). In *United Nations*. https://legal.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf
[82] United Nations. Convention on the Protection and Use of Transboundary Watercourses and International Lakes. (1991). In *United Nations*. https://treaties.un.org/doc/Publication/MTDSG/Volume%20II/Chapter%20XXVII/xxvii-5.en.pdf
[83] United Nations. International Covenant on Economic, Social and Cultural Rights. (1996). In *Office of the United Nations High Commissioner for Human Rights*. https://www.ohchr.org/sites/default/files/cescr.pdf
[84] **Interview with Professor Fadi Qammar** - Former Undersecretary of the Ministry of Water and Energy and Head of the Lebanese Delegation for Water Negotiations with Syria, Lebanon. Conducted on August 14, 2025, on *Water Diplomacy in Lebanon*.

networks and protection of limited water sources. Regionally, mobilize climate finance (e.g., Green Climate Fund), expand groundwater recharge, promote sustainable agriculture, and accelerate solar-powered desalination investments to strengthen resilience and reduce dependence on contested resources.

4. *Promote sustainable water use in agriculture*

Support water-efficient crops, provide interest-free loans for innovative water-saving agricultural projects, and align regional strategies for crop selection, irrigation efficiency, and food system planning. [85]

Jordan demonstrates success with palm cultivation using alternative water sources. Lebanon emphasizes agricultural reform as part of resilience strategies, and Palestine (particularly Gaza) requires interventions integrating water rights with agricultural sustainability and the launch of climate change adaptation projects such as the construction of tertiary treatment plants in Gaza to reuse wastewater, enhancing Palestine's ability to manage its water resources sustainably.

5. *Foster private-sector participation and innovation*

Create enabling environments for public–private partnerships (PPPs) in infrastructure rehabilitation, wastewater treatment, non-revenue water reduction, and smart water-management technologies. Build capacity for local engineers, researchers, and water professionals, and establish regional centers of excellence focused on transboundary water management and climate-adaptive technologies.

Jordan for instance could benefit from establishing an international water fund to support Jordanian projects such as the *Agricultural Motivation Program* [86] with interest-free loans with potential funding from the European Union or Gulf States and investments from the private sector. Lebanon could foster its uses of international grants from institutions such

[85] **Interview with Imran Sawalha** - Ministry of Agriculture, Jordan. Conducted on August 11, 2025, on *Agricultural production and Water Justice in Jordan.*
[86] This example, not yet implemented, was mentioned during the Interview with **Imran Sawalha**.

as the World Bank and the European Union to build dams and water treatment plants, using economic diplomacy to attract funding. Palestine could work with the Organization of Islamic Cooperation to fund Palestinian projects, such as the Gaza desalination plan and establishing a fund to support water infrastructure in Palestine.

6. *Protect civilians' access to water and uphold international law*

Mobilize international mechanisms to prevent militarization or weaponization of water and hold violators accountable.

Jordan and Lebanon face disputes over shared rivers and upstream actors. Meanwhile, Palestine highlights the urgent need to prevent infrastructure destruction and water theft, with available resort to international courts such as the International Court of Justice and the World Trade Organization to challenge Israel's violation of water agreements and its monopoly on selling water to Palestinians at high prices. Regionally, coordinate diplomatic efforts to secure compliance with international law, safeguard shared water resources, and guarantee access to water for drinking, agriculture, and sanitation as a protected civilian right.

7. *Empower media and civil society to advocate for water justice*

Develop a unified definition of water justice, train journalists in human-rights-based reporting, strengthen academic cooperation, and simplify technical water terminology translated into Arabic to engage the public. Promote investigative, cross-border journalism to expose environmental injustices and amplify marginalized voices. Strengthen civil society's capacity to champion advocacy campaigns, influence negotiations, and ensure water justice remains central in policy agendas.

8. *Advance internal equity and public awareness*

Prioritize equitable water distribution, safeguard future generations, enforce judicial rulings affirming water rights, and integrate social justice into water policies.

Jordan emphasizes raising awareness of scarcity and water quality and could resort to 'local water court' to prosecute water theft violations.[87] Lebanon stresses comprehensive planning for social, environmental, and health needs, and Palestine calls for recognition of rights to shared watercourses and could further rely on international awareness campaigns, highlighting documented Israeli violations. Regionally, adopt people-centered water diplomacy that emphasizes human dignity, access to services, and environmental protection.

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Interviews conducted remotely

- **Interview with Dana Abi Ghanem** - Research Track Director at the Arab Reform Initiative, Lebanon. Conducted on August 13, 2025, on *Water and social justice in Lebanon.*
- **Interview with Farah Atiyat** - Journalist specializing in environmental affairs and climate justice, Jordan. Conducted on August 14, 2025, on *the role of the media and water justice.*
- **Interview with Professor Fadi Qammar** - Former Undersecretary of the Ministry of Water and Energy and Head of the Lebanese Delegation for Water Negotiations with Syria, Lebanon. Conducted on August 14, 2025, on *Water Diplomacy in Lebanon.*
- **Interview with Dr. Duraid Mahasneh** - Water Expert and Chairman of the Board of Directors of the Idama Association for Energy, Water and Environment, Jordan. Conducted on August 11, 2025, on *Water agreements in Jordan.*
- **Interview with Dr. Abdul Rahman Al-Tamimi** - Director of the Palestinian Hydrology Group, Palestine. Conducted on August 14, 2025, on *Water Justice in Palestine and the Occupied Territories.*
- **Interview with Ahmed Bali** - Ministry of Water and Irrigation, Jordan. Conducted on August 4, 2025, on *Water resources and quotas in Jordan.*
- **Interview with Imran Sawalha** - Ministry of Agriculture, Jordan. Conducted on August 11, 2025, on *Agricultural production and Water Justice in Jordan.*
- **Interview with Mr. Hisham Al-Haisa** - Secretary General of the Jordan Valley Authority. - Conducted on August 12, 2025, on the *Jordan Valley Authority and Water Distribution.*
- **Interview with Yaqoub Kilani** - Palestinian Ministry of Agriculture. Conducted on August 13, 2025, on *Water consumption and agricultural water quotas in Palestine.*
- **Interview with Youlios (Jules) Hatem** - Water expert and consultant with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Conducted on August 07, 2025, on *Water resources and their distribution in Lebanon.*