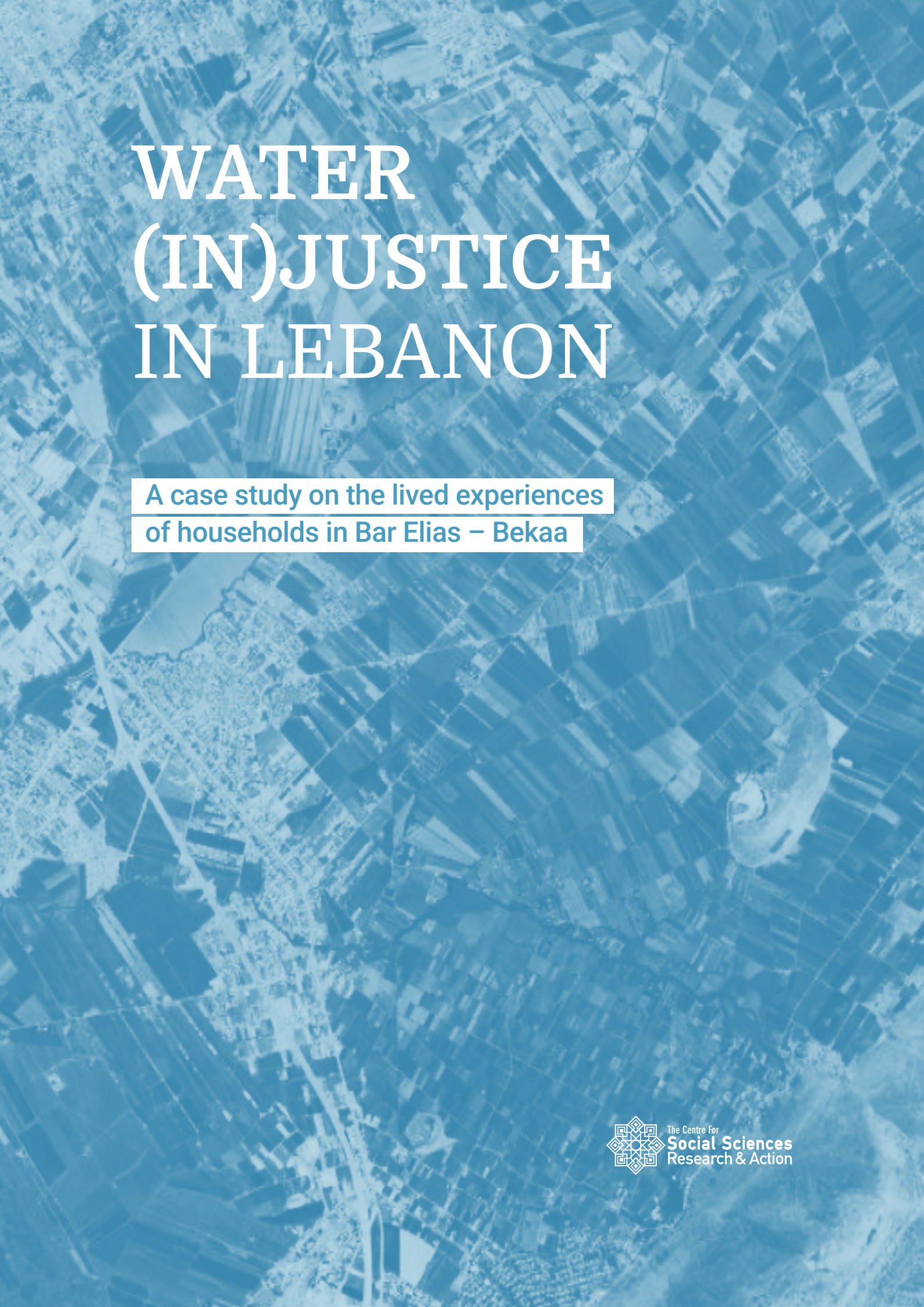

WATER (IN)JUSTICE IN LEBANON

A case study on the lived experiences of households in Bar Elias – Bekaa

The Centre For Social Sciences Research & Action

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This study has been produced by CeSSRA as part of its collaboration with UNICEF, under a joint project entitled "Towards inclusive social policy and a welfare state in Lebanon," to promote independent research and policy advocacy. UNICEF does not endorse the viewpoints, analysis, or opinions expressed by the author(s). The views expressed in this publication are solely those of the author(s) and do not necessarily reflect the views of the Centre for Social Sciences Research & Action nor its partners.

CONTENTS

TEAM 2

ABSTRACT 5

INTRODUCTION 6

LEBANON: A SOCIOECONOMIC OVERVIEW 10

1. PRE AND POST-WAR SOCIOECONOMIC CHALLENGES 11
2. WATER CHALLENGES 11
3. COPING WITHOUT WATER: LESSONS FROM LEBANON AND THE GLOBAL SOUTH 12

THE LIVED EXPERIENCE OF THE WATER-POOR COMMUNITIES IN BAR ELIAS 15

1. STRUCTURAL CHALLENGES: HOUSING AND LIVING CONDITIONS 16
2. MOBILITY CONSTRAINTS AND INTERSECTIONAL CHALLENGES 17
3. WATER COMMODIFICATION AND ECONOMIC BARRIERS 18
4. LACK OF AUTONOMY AND THE QUEST FOR AGENCY 18
5. TENSIONS OVER SCARCE RESOURCES: WATER, INEQUALITY, AND SOCIAL CONFLICTS 19
6. ENVIRONMENTAL CHALLENGES 20
7. HEATH CONCERNS AND CHALLENGES 21

COPING STRATEGIES: INDIVIDUAL AND HOUSEHOLD COPING SYSTEMS 22

1. RESOURCE MANAGEMENT 23
2. COMMUNITY AND FAMILY SUPPORT 26
3. PERSONAL STRENGTH AND RESILIENCE 27

WATER INJUSTICE: A GENDERED AND INTERSECTIONAL LENS ON INEQUALITY 28

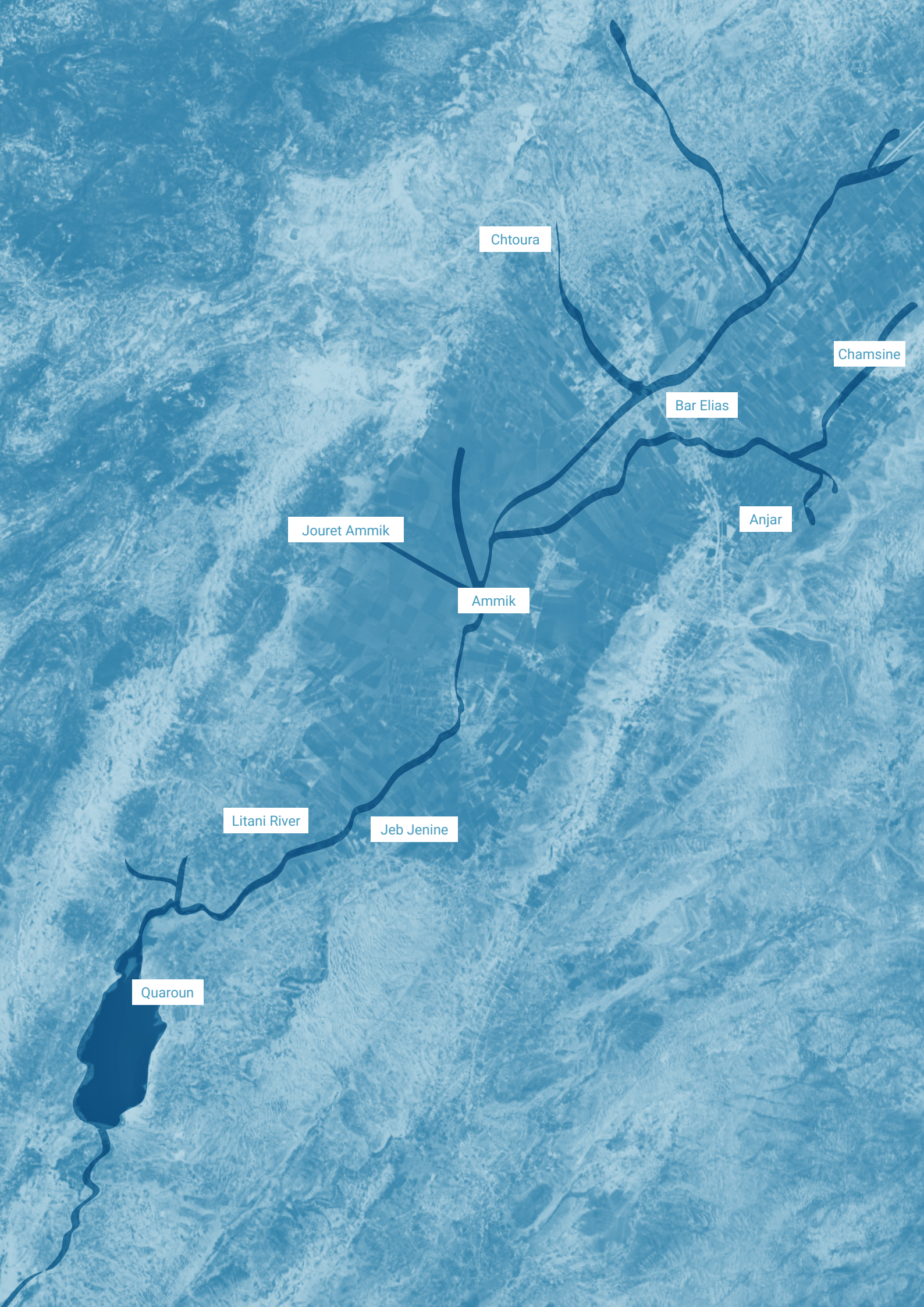
1. AN INTERSECTIONAL DIMENSION TO WATER INJUSTICE 29
2. THE POLITICAL DIMENSION TO WATER INJUSTICE 30
3. THE GENDERED BURDEN OF WATER POVERTY 32

CONCLUSION AND RECOMMENDATIONS 34

REFERENCE LIST 38

LIST OF TABLES AND BOXES

TABLE 1. DISTRIBUTION OF PARTICIPANTS IN KII 9
TABLE 2. HOUSEHOLD DISTRIBUTION BY LIVING CONDITIONS 9
BOX 1. SAFE WATER AS A BASIC HUMAN RIGHT 23


Chtoura
Chamsine
Bar Elias
Anjar
Jouret Ammik
Ammik
Litani River
Jeb Jenine
Quaroun

ABSTRACT

This study examines the water-related challenges faced by residents of Bar Elias, Lebanon, focusing on the impacts of water scarcity, quality, and access on vulnerable populations. The study highlights how inadequate water resources in the region exacerbate socio-economic disparities, particularly among women, children, refugees, the elderly, and persons with disabilities. In Bar Elias, women are primarily responsible for water collection, while children are vulnerable to waterborne diseases, which further hinder their development. The elderly face heightened health risks due to water pollution, and individuals with disabilities encounter significant barriers to accessing clean water due to insufficient infrastructure.

The study also explores the broader socio-political context of Lebanon's water crisis, emphasizing the shortcomings of current water management policies and the need for comprehensive reforms. The study critiques the lack of political will to prioritize equitable water distribution and to implement reforms that address the root causes of the crisis. It suggests that, without substantial changes in governance and resource allocation, the gap in access to clean water will continue to widen, disproportionately affecting the most vulnerable populations.

INTRODUCTION

This study examines the pressing issue of water (in) justice in Lebanon through the lived experiences of marginalized households in Bar Elias, with a focus on women, children, the elderly, and persons with disabilities. Bar Elias is a densely populated town in Lebanon's Bekaa Valley, known for its agricultural significance and its role as a hub for vulnerable populations, including refugees and low-income households, making it a focal point for studying water access challenges.

By investigating the barriers to water access and the pervasive impacts of water insecurity on daily life, health, gender roles, household dynamics, and economic well-being, the study highlights the human cost of Lebanon's water crisis. Thus, the study investigates how households navigate water scarcity through diverse coping strategies, including water storage, reliance on alternative sources, social support networks, purchases from private vendors, illegal connections to public networks, and innovative practices such as water reuse and treatment.

While rooted in the experiences of one locality, the research underscores the broader implications of water commodification on Lebanon's population. Structured around a literature review, an analysis of Lebanon's water challenges, a detailed methodology, and findings, the study concludes with actionable policy recommendations aimed at advancing social justice, socio-economic rights, and equitable access to water in Lebanon.

This report sets out to examine water (in)justice in Lebanon through a focused exploration of the lived experiences of vulnerable persons and underprivileged households in Bar Elias. It aims to assess the multifaceted impacts of water insecurity on the daily life of the water-poor and the economically poor individuals and households, while identifying the coping mechanisms employed to secure water access. These strategies—such as water storage, constructing alternative sources, borrowing from social networks, purchasing from private vendors, illegal connections to public networks, water harvesting, and reuse or treatment practices—are often labor-intensive, time-consuming, and disproportionately place the burden on women and children within the domestic economy. The report also considers the economic strain of these short-term solutions on vulnerable households. Beyond these localized experiences, it highlights broader challenges associated with the commodification of water and its repercussions on the wider population. How could the examination of these lived experiences of the water-poor shape policy recommendations that advance social justice, socio-economic rights, and equitable water access in Lebanon?

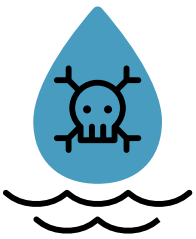
Bar Elias, a semi-urban town located in the Bekaa Valley along the Beirut-Damascus Highway, is home to a diverse population, including Lebanese, Palestinians, and Syrian refugees. Surrounded by Anjar to the east, Zahle to the west, Kafr Zabad and Addalhamiah to the north, and Almarj to the south, Bar Elias faces significant water and sanitation challenges. The town's water supply is inadequate and polluted, worsened by illegal connections and an overstretched water network. Despite being classified as rural, Bar Elias has a population of over 130,000 people, including 30,000 Lebanese[1] (mostly Sunni, with a Christian minority), around 100,000 Syrian refugees[2] (27,022 of whom are registered with UNHCR[3]), and 4,000 Palestinian refugees (arrived post-1948). Most Lebanese nationals, Palestinians, and Syrian refugees live in residential shelters, though some Syrians reside in non-residential

1. Interview with one local mayor (*mukhtar*).
2. Estimated number given by *mukhtars* and locals.
3. United Nations High Commissioner for Refugees (UNHCR). (2022). *Syria Refugee Response Lebanon: Bekaa & Baalbek-El Hermel Governorate - Distribution of the Registered Syrian Refugees at the Cadastral Level.*
4. Figures provided to the author by the Bekaa Water Establishment

structures like garages, factories, and informal tented settlements, sharing resources and public services with the Lebanese. Refugees face significant restrictions on economic and political rights, particularly regarding property acquisition.

In 2023, the municipality of Bar Elias was dissolved, and the town now falls under the jurisdiction of the Bekaa Governor. The Bekaa Water Establishment (BWE) oversees water and wastewater services, with 95% of households connected to the potable water network, though only 18% of subscribers are actively paying their dues as of July 2023[4]. The water supply, sourced from the Chamsin spring, is insufficient and of poor quality due to the aging network, the influx of Syrian refugees, and illegal connections.

The Litani River, which runs through Bar Elias, was once used for drinking, recreation, and irrigation. However, it is now heavily polluted due to unchecked industrial, sewage, and agricultural waste dumping, contributing to serious health issues, including rising cancer rates.



The Litani River once used for drinking, recreation, and irrigation, is now heavily polluted.

The study's sample was drawn from areas severely affected by water challenges, including pollution near the Litani River and uneven water access in Mekawi, Tal, and Damascus streets, particularly in the summer months. Bar Elias was selected as a case study because it exemplifies the transition from a rural to an urban area due to the refugee influx, reflecting broader challenges faced by many Lebanese towns. The town's dissolved municipality and limited water authority, coupled with strained infrastructure, illustrate the challenges of serving a population three times its previous size. Bar Elias serves as a critical case for understanding the strain on Lebanon's public water services and the severe pollution of the Litani River. These issues impact all residents, including vulnerable groups such as women, children, the elderly, and persons with disabilities. The town's moderate aridity, preventing extreme water scarcity, provides a valuable context for understanding water access issues in a situation that is not yet as dire as in other regions. Additionally, this case highlights the struggles of communities to advocate against pollution, even as their efforts often exacerbate the situation.

→ This research employed a qualitative approach, combining an extensive literature review with site-specific data collection, and interviews and focus groups with a total of 33 research participants. Data was gathered through the following methods:

KEY INFORMANT INTERVIEWS
14 interviews with experts

Fourteen interviews were conducted to deepen the understanding of local water-related issues and to select households facing diverse water challenges. The interviewees included mukhtars (village-level elected representatives), activists, water authority representatives, local youth and social club members, NGOs, INGOs, and a donor (cf. Table 1 below). A snowball sampling technique was used to identify these participants, with interviewees suggesting additional key individuals for follow-up discussions. The topics covered in these interviews included water accessibility, quality, distribution equity, governance and management, community participation, the impacts of water insecurity, and available support systems.

HOUSEHOLD INTERVIEWS AND FOCUS GROUP DISCUSSION
10 interviews with households, and 9 participants in the focus group

Semi-structured interviews were conducted with ten households, from Lebanese, Palestinian and Syrian nationalities. The interviews took place in small apartments, where additional insights were gathered from spouses and household members, providing a more holistic view of the household experience. An additional focus group discussion involving young household members was also organized.

Thematic analysis was employed to examine the qualitative data collected from both key informant and household interviews, focusing on the impacts of water insecurity on participants' lived experiences. The analysis of these themes informed the development of recommendations aimed at addressing identified challenges and supporting policy decisions related to the right to water.

→ Sample selection was based on insights from the literature review and key informant interviews. The final sample included ten participants from nine different households: six women (two Lebanese, two Palestinian, two Syrian), three men (all Lebanese), and one young person (Syrian).

Participants were selected from diverse living conditions: four Lebanese and two Palestinian refugee households resided in formal dwellings, one Lebanese household lived in an informal tented settlement, and one Syrian family occupied a non-residential shelter. The sample also included two elderly individuals (one man, one woman), four women with disabilities (two Lebanese, two Palestinian), and one pregnant Syrian woman.

The majority of participants were from low-income backgrounds, residing in water-scarce areas of Bar Elias near the Litani River, including Mekawi, Tarik Der Zanoun, and Hay Al-Tal. Household interview participants ranged in age from 35 to 77 years. Lebanese and Palestinian populations living in formal dwellings were given priority due to the limited studies on their water access and the similarity of their housing conditions (cf. Table 2 below). Syrian refugees in non-residential dwellings were given less focus, as extensive research on their water access and humanitarian aid conditions already exists. A particular focus was placed on low-income households, as they face the greatest challenges regarding water access, with financial instability being widespread across the study area. Women, primarily responsible for water management within households, were prioritized to capture insights from various subgroups, including female heads of households, pregnant women, individuals with disabilities, mothers, and elderly women.

Women, primarily responsible for water management within households, were prioritized to capture insights from various subgroups, including female heads of households, pregnant women, individuals with disabilities, mothers, and elderly women.

TABLE 1
DISTRIBUTION OF PARTICIPANTS IN KII

RESEARCH PARTICIPANTS	NUMBER OF PARTICIPANTS
Donor: Swiss Agency for Development Cooperation	1
Mukhtar	2
Activists including: → Water engineer → Water pollution expert → Local environment committee → Litani River Follow-up Committee	4
Water Establishment representatives: → Former Director-General → Head of pumping stations and projects	2
Local youth and social club members: → Moultaka Al Chabab → Chabeb Betheb El Kheir	2
Local NGOs including → Lebanese Union for Persons with Physical Disabilities (LUPD) → Najdeh Association	2
INGOs including World Vision – WaSH Team (seven experts have provided their input during this KII)	1
TOTAL	**14**

TABLE 2
HOUSEHOLD DISTRIBUTION BY LIVING CONDITIONS

RESEARCH PARTICIPANTS ACCORDING TO LIVING CONDITION	HOUSEHOLDS
Lebanese Households in Formal Dwellings	4
Palestinian Refugee Households in Formal Dwellings	2
Syrian Refugee Households (Non-Residential)	2
Lebanese Household (Informal Settlement)	1
TOTAL	**9**

LEBANON: A SOCIOECONOMIC OVERVIEW

Since 2019, Lebanon has been facing severe political instability, an economic collapse, and ineffective governance, which have triggered hyperinflation, a sharp decline in GDP, and a depreciation of the Lebanese pound by over 90% against the US dollar[5]. This has led to widespread poverty and reduced purchasing power. In July 2022, the World Bank downgraded Lebanon to a lower- middle-income nation, and the unemployment rate surged to 29.6%[6]. Basic services, including water, are on the brink of collapse, further strained by the high concentration of Syrian refugees[7] and the recent Israeli war in Gaza which immediately led to an open war front with Lebanon.

90%
depreciation of the Lebanese pound against the US dollar

29.6%
unemployment rate

THOUSANDS
of deaths as a result of of the recent war with Israel

15,000
individuals injured as a result of of the recent war with Israel

5. United Nations Development Programme (UNDP). (2022). *Lebanon Crisis Response Plan 2021-2022.*

6. Central Administration of Statistics (CAS) of Lebanon and International Labour Organization (ILO). (2022). Lebanon follow-up Labour Force Survey January 2022.

7. United Nations High Commissioner for Refugees (UNHCR). (2022). *Lebanon fact sheet*.

1
PRE AND POST-WAR SOCIOECONOMIC CHALLENGES

The country's first National Social Protection (SP) Strategy, launched in February 2024, aimed to address these challenges but is hindered by significant implementation barriers. Since its adoption, Lebanon's National Social Protection Strategy aimed to address the deepening socio-economic crises that have plagued the country for years. However, its effectiveness has been severely undermined by the outbreak of the recent war with Israel in October 2023, which escalated Lebanon's vulnerabilities and exacerbated its already precarious economic and social conditions. The war has resulted in thousands of deaths and left more than 15,000 individuals injured, further straining an already overstretched public health and social protection infrastructure. As the conflict intensified, the needs for universal social protection grew exponentially, with many more individuals requiring immediate assistance for healthcare, housing, and food security. Yet, the war drained the resources and capacities of both the public and private sectors, leaving them ill-equipped to meet the expanding demands. The devastating impact of the war has not only displaced more people and heightened regional instability but also strained Lebanon's already fragile financial system. The national budget, already stretched thin by the previous economic collapse, was further depleted by emergency responses to the conflict, leaving little room for the implementation of the National Social Protection Strategy. In the face of this, the majority of the Lebanese population, who were already without sufficient social safety nets, have been left in even more dire conditions, unable to access basic services, including healthcare, housing, and nutrition. Vulnerable populations, such as the elderly, children, and persons with disabilities, have been particularly hard-hit, as their needs often go unmet in the aftermath of such a devastating war. Although the intention behind the SP strategy was to provide a foundation for long-term socio-economic recovery and stability, the war has rendered the strategy almost irrelevant in practice, as the existing structures lack the capacity to deliver essential protections for the population.

2
WATER CHALLENGES

Even before the war, Lebanon's four Water Establishments struggled to provide adequate water and sanitation services due to financial constraints, including an inability to afford essential repairs, parts, and diesel, particularly during the ongoing economic and power crises[8]. Few wastewater treatment plants achieve tertiary treatment, further burdening the system. This situation has led to widespread discontent and a loss of trust in the government[9].

Vulnerable groups—such as women, children, the elderly, and persons with disabilities—are disproportionately affected by water shortages and water commodification, facing limited access to essential services like healthcare, education, and employment[10]. Poorly managed or contaminated water is contributing to child undernutrition and the spread of communicable diseases. Despite Lebanon's commitments to international human rights conventions and SDG 6 on clean water[11], the country continues to struggle in realizing the right to water due to governance failures, corruption, and political instability. By 2022, only 48% of the population had access to safely managed drinking water services (indicator 6.1.1)[12] from improved sources[13], with many households

8. UN News. (2021). Lebanon: Public water system on the verge of collapse, UNICEF warns.

9. Transparency International. (2021). Corruption Perceptions Index 2021.

10. United Nations Children's Fund (UNICEF). (2022). *Lebanon humanitarian situation report.*

11. SDG 6 refers to Sustainable Development Goal 6, which is part of the United Nations' 2030 Agenda for Sustainable Development. SDG 6 aims to ensure the availability and sustainable management of water and sanitation for all. This goal focuses on providing universal access to clean water and sanitation, improving water quality, promoting water use efficiency, and addressing water scarcity and pollution. Indicator 6.1.1 measures the proportion of the population using safely managed drinking water services. This indicator tracks progress toward the achievement of universal access to safe drinking water.

12. United Nations Water. (2022). *SDG 6 snapshot: Lebanon.*

13. Improved drinking water sources include piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater, and packaged or delivered water.

relying on informal sources like water tankers and bottled water, which often leads to contamination. Therefore, the public water sector faces financial deficits exacerbated by currency devaluation and ineffective tariff systems.

Households now spend over 6% of their income on water[14], significantly exceeding the 3% global average threshold[15]. Aging infrastructure, climate change, population growth, internal migration, and the large Syrian refugee presence have further increased water demand[16]. Agriculture, which accounts for 60% of water consumption, relies heavily on surface water, exacerbating issues like fecal pollution and antibiotic resistance in rivers such as the Litani.

3 COPING WITHOUT WATER: LESSONS FROM LEBANON AND THE GLOBAL SOUTH

Due to inadequate water policies and the lack of reliable infrastructure, many water-poor communities around the world have developed local coping mechanisms to address water insecurity. These strategies are particularly evident in vulnerable populations, where water scarcity and pollution exacerbate existing hardships. For example, among the Haudenosaunee women, coping mechanisms include rebuilding their relationship with water, leaning on family and community support, and engaging in meticulous planning. Community-driven initiatives, such as the Six Nations Birthing Center, along with the involvement of family members, also play a pivotal role in managing the mental health impacts of water insecurity[17].

Research by Raul Pacheco-Vega highlights how consumer behavior often favors bottled water over public systems, despite the availability of tap water[18].

Indeed, inequitable socioeconomic structures, such as water privatization and globalization, impact health and well-being[19]. For instance, Raul Pacheco-Vega argued that the privatization and commercialization of water through bottled water exacerbate inequities in access to clean water, thus undermining water justice[20]. Ethical concerns are prominent, as bottled water consumption leads to environmental degradation from plastic waste and raises moral questions about profiting from a basic human need. He stressed the need for a rights-based approach to water governance, prioritizing public access to safe and affordable drinking water over commercial interests. The reliance on bottled water weakens public water systems by diverting resources from necessary infrastructure improvements.

In Lesotho, for instance, large-scale dam projects aimed at water export have transformed local water values into national symbols. The Lesotho Highlands Water Project (LHWP), a multibillion-dollar effort to dam and divert water from the mountains of Lesotho to South Africa, serves as an example. This project has been integrated into Lesotho's national iconography, symbolizing national identity, sovereignty, and economic prosperity. However, national elites in Lesotho hoped that the water export would bolster the country's political and economic position, but this optimism was misplaced. In 1998, amid political unrest in Lesotho, a Southern African Development Community (SADC) military mission spearheaded by South Africa secured the LHWP's Katse Dam. This incident demonstrated the dominance of South Africa over its smaller neighbor, highlighting that the commodification of water was not a neutral economic exchange but rather an example of South African geopolitical dominance[21].

14. Choueiri, Y., Lund, J., London, J.K., Spang, E.S. (2022). (Un)Affordability of Informal Water Systems: Disparities in a Comparative Case Study in Beirut, Lebanon.

15. United Nations Development Programme (UNDP). (2006). *Human development report 2006: Beyond scarcity: Power, poverty and the global water crisis*.

16. Ministry of Environment, UNHCR, UNICEF, UNDP. (2020). *Lebanon State of the environment and future outlook: Turning the crisis into Opportunities.*

17. Sultana, A., Wilson, J., Martin-Hill, D., Davis-Hill, L., & Homer, J. (2022). Assessing the Impact of Water Insecurity on Maternal Mental Health at Six Nations of the Grand River. *Frontiers in Water*.

18. Pacheco-Vega, R. (2020). Human right to water and bottled water consumption: Governing at the intersection of water justice, rights, and ethics. In F. Sultana & A. Loftus (Eds.), *Water politics: Governance, justice, and the right to water.*

19. Amber, W., & Beresford, M. (2018). The economic anthropology of water.

20. Pacheco-Vega, R. (2020). Human right to water and bottled water consumption: Governing at the intersection of water justice, rights, and ethics. In F. Sultana & A. Loftus (Eds.), *Water politics: Governance, justice, and the right to water*.

21. Hoag, C. (2019). 'Water Is a Gift that Destroys': Making a National Natural Resource in Lesotho. *Economic Anthropology.*

Similarly, in Lebanon, the majority of households avoid drinking tap water and prefer bottled water. This preference for bottled water is linked to perceptions of safety and convenience, reflecting broader global trends.

Low-income households are disproportionately affected by the costs of limited water availability, which contribute to social inequities.

A study in Mexico City on household adaptations to water scarcity reveals the hidden private costs that households incur in response to limited water availability. These include direct financial costs, such as purchasing water storage systems, purification devices, and bottled water, as well as non-monetary costs like the labor-intensive management of water and the need to adjust daily schedules based on the availability of water[22]. Low-income households, who receive public water less frequently, are disproportionately affected by these costs, which contribute to social inequities and an uneven distribution of water. The intermittent nature of the water supply also increases health risks, particularly in relation to diarrheal diseases.

The concept of informal safety nets, as defined by Devereux[23], refers to coping strategies that rely on support from other households during times of hardship. It is defined as the "subset of coping strategies that involve drawing on support from other households during periods of particular livelihood hardship." This idea has been central to research on coping strategies, with informal safety nets often embedded within the moral economy[24], social capital, and local institutions[25]. These reciprocal relationships, rooted in kinship or geographical proximity, can offer crucial support during crises. However, Beall (1995) noted that such systems among the urban poor in Pakistan can be exploitative and oppressive, showing that not all social networks are harmonious.

For instance, informal water provisioning highlighted the diverse and often overlooked economies of water. Since the 1970s, anthropologists have studied informal income production[26], but there is less research on informal service provision like water delivery. In many communities, informal water vendors and illicit pilfering from municipal water systems are common ways to obtain water.

These methods are crucial for survival and can promote water justice but may also lead to exploitative water cartels[27]. More research is needed to understand how informal water economies can provide safe, just, and reliable water access.

In another example from the literature, in Divina Providencia neighborhood, residents rely on unauthorized connections to the municipal water network, called tomas clandestinas. These connections divert water via a complex system of plastic pipes that carry water to backyard spigots. Despite the clandestine nature, the system is openly visible and organized through a neighborhood water committee that manages access and maintenance. "Rosa and her neighbors rely on an intricate assemblage of unauthorized taps, unpaid labor, and nonmarket transactions to supply water and survive. In the absence of the grid, Rosa and other 'midnight plumbers' build networks and self-organize management of water that municipalities are unable or unwilling to provide."[28]

22. Huberts, A., Palma, D., Bernal García, A. C., Cole, F., & Roberts, E. F. S. (2023). Making scarcity "enough": The hidden household costs of adapting to water scarcity in Mexico City.

23. Devereux, S. (1999). 'Making less last longer': informal safety nets in Malawi.

24. Swift, J. (1989). Why are rural people vulnerable to famine?. *IDS bulletin, 20*(2), 8-15. Adams, J. (1998). Structural adjustment, safety nets, and destitution. *Economic Development and Cultural Change, 46*(2), 403-420.

25. Moser, C. O. (1998). The asset vulnerability framework: reassessing urban poverty reduction strategies. *World development, 26*(1), 1-19.

26. Amber, W., & Beresford, M. (2018). The economic anthropology of water.

27. Amber, W., & Beresford, M. (2018). The economic anthropology of water.

28. Meehan, K. (2013). Disciplining De Facto Development: Water Theft and Hydrosocial Order in Tijuana. *Environment and Planning D: Society and Space.*

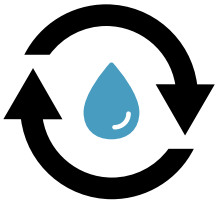
Moreover, studies in South Africa have raised concerns about the decline of the moral economy in many parts of Africa, emphasizing that monetization and commoditization contribute to this trend[29]. Moral economies are characterized by shared beliefs in the right to subsistence and norms of reciprocity. The literature shows that moral economies of water evolve independently across cultures[30].

Moreover, informal water vendors in Latin American cities like Cochabamba, Bolivia, play a key role in water access, often highlighting the failures of formal systems to provide equitable access. These practices can also promote justice by providing access where formal systems fail but can lead to exploitation through water cartels. In many communities, informal water vendors and illicit connections to municipal systems are crucial survival strategies, as observed in the role of water mafias in Bangalore, India, where control over water resources demonstrates urban political and social inequities[31].

As a result, formal safety nets, such as direct transfers and public works, are increasingly necessary to safeguard livelihoods[32].

In Lebanon, diverse coping mechanisms are employed by communities to cope with water scarcity and pollution. However, few studies have examined the specific coping strategies of Lebanese and Palestinian communities compared to Syrian refugees, and even fewer have focused on marginalized groups such as women, children, the elderly, and persons with disabilities. Some of the common strategies adopted by households include water storage, constructing alternative water sources, pooling resources, sharing and borrowing water from social networks, purchasing water from private vendors or truckers, and utilizing water trucking services provided by humanitarian organizations (22% of Syrian refugee households in the Bekaa[33]). Additionally, many households purchase bottled water from branded sources or water refilling kiosks (54% of Lebanese, Palestinian, and migrant households[34], and 7% of Syrian refugee households in the Bekaa)[35]. While drinking piped water is common among 32% of Syrian refugee households[36], 38% of Lebanese, Palestinian, and migrant households manage and reuse water by reducing consumption for non-essential purposes and prioritizing essential water uses.

Other measures include illegal connections to public water networks, water harvesting, and fetching water. In the Bekaa, 61% of Lebanese, Palestinian, and migrant households depend on men for fetching water, while 23% rely on any household member, and 16% depend on women. The average time spent fetching water is around 10 minutes. Furthermore, 15% of households that do not use bottled water treat their water to improve its quality, with 83% using water filters. Finally, 22% of Lebanese, Palestinian, and migrant households divert funds from other essential needs to cover water expenses (for instance, for trucks or tanks, etc.), further highlighting the economic burden imposed by water insecurity.



Moral economies are characterized by shared beliefs in the right to subsistence and norms of reciprocity. The literature shows that moral economies of water evolve independently across cultures.

29. Arnall, A., Furtado, J., Ghazoul, J., De Swardt, C. (2024). Perceptions of informal safety nets: A case study from a South African informal settlement.
30. Amber, W., & Beresford, M. (2018). The economic anthropology of water.
31. Ranganathan, M. (2014). Mafias in the waterscape: Urban informality and everyday public authority in Bangalore. *Water Alternatives*.
32. Devereux, S. (1999). 'Making less last longer': informal safety nets in Malawi.
33. United Nations High Commissioner for Refugees (UNHCR). (2023). Vulnerability assessment of Syrian refugees in Lebanon (VASYR) 2023.
34. REACH Initiative, & United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA). (2024). *Multi-Sectoral Needs Assessment: Lebanese households in Lebanon.*
35. VASYR 2023.
36. VASYR 2023.

THE LIVED EXPERIENCE OF THE WATER-POOR COMMUNITIES IN BAR ELIAS

Households and individuals in Bar Elias face a complex array of economic, social, and physical challenges that deeply affect their daily lives, well-being, and social interactions. Water shortages and pollution are major issues that impact various groups, but the resilience and mutual support within these communities often enable them to manage these difficulties.

Although interviewees found it difficult to fully express the impact of water insecurity, their non-verbal cues and personal narratives provided invaluable insights into their experiences. Water insecurity intersects with other hardships, further intensifying existing inequities, particularly among marginalized groups.

Frustration with water scarcity emerged as a common theme, leading to emotional exhaustion, strained family dynamics, and a pervasive sense of hopelessness. These pressures have the potential to trigger stress and mental health disturbances, compounding the physical challenges posed by inadequate water supply.

While these findings are specific to Bar Elias, they reflect broader challenges faced by many regions across Lebanon. The water supply systems and issues identified in Bar Elias are similar to those in other parts of the country, albeit with varying levels of severity. The coping mechanisms and sources of support observed in Bar Elias are likely to be found in other communities struggling with similar water-related challenges.

1 STRUCTURAL CHALLENGES: HOUSING AND LIVING CONDITIONS

The public water supply network, installed fifteen years ago, does not provide equal access to all neighborhoods in Bar Elias, such as Al-Mekawi, Al-Nahriye Street, and Al-Saade. Aging infrastructure, including old water pipes, leads to significant leakages and contamination, creating disparities where some households receive clean water, while others are exposed to polluted water. Low water pressure further exacerbates these issues, particularly for households located in higher areas, where water is not distributed evenly.

The findings confirm that the Intermittent Water Supply (IWS) system, which is widespread throughout Lebanon, is also prevalent in Bar Elias, delivering water only for a few hours each week. This situation results from rationing water distribution across certain areas, inconsistent water pressure, or an inadequate water grid that fails to reach all neighborhoods uniformly. Additionally, favoritism and corruption may affect the distribution of water, with more affluent households, such as those near summer resorts or those with connections, receiving better access. Georges, a father of a low-income family of eleven living near the Litani River, shared, "We haven't seen water on this street for fifteen years, since the installation of the new water supply network."

The quality of the water that reaches households varies significantly, depending on the age and condition of the infrastructure. This variability leads to differing levels of leakage and contamination, especially when public water, well water, and trucked water are stored together in rooftop tanks. Even clean water can become polluted if stored in an unclean tank. As a result, access to clean and safe water is influenced by numerous external and internal factors. The inconsistency in water quality has led to a general mistrust of the public water supply, causing some households to rely on bottled water, which is perceived as safer. This situation highlights how privatization and the commodification of water exacerbate social inequities, with wealthier households able to afford clean water, while lower-income households are left with poor-quality water from unclean tanks and water points.

Research has shown that IWS not only damages the water grid but also deteriorates water quality both within the grid and in households[37]. Furthermore, studies have linked IWS to an increased incidence of diarrheal diseases, further complicating the achievement of consistently available and uncontaminated water[38]. Water tanks, often placed on rooftops, are difficult to access due to poorly maintained stairs, especially for those with limited mobility. The location of water valves on the ground floor, while residents live upstairs, creates additional inconvenience. In non-residential, temporary housing, there is no connection to the public water supply, leaving residents without access to clean water.

37. Huberts, A., Palma, D., Bernal García, A. C., Cole, F., & Roberts, E. F. S. (2023). Making scarcity "enough": The hidden household costs of adapting to water scarcity in Mexico City.

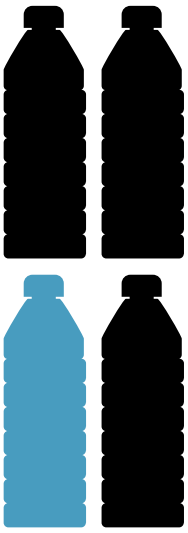
38. Bivins, A. W., Sumner, T., Kumpel, E., Howard, G., Cumming, O., Ross, I., Nelson, K., & Brown, J. (2017). Estimating infection risks and the global burden of diarrheal disease attributable to intermittent water supply using QMRA.

Wealthier households often benefit from better water access through private treatment and filtration systems that lower-income households cannot afford. Additionally, roads are not designed to accommodate persons with disabilities, limiting mobility for people with wheelchairs, particularly when attempting to purchase water from shops. The use of more powerful pumps in some areas further restricts access for households located after these buildings. Furthermore, few water points are available, and those that exist are often unclean. The proximity of UNRWA and public schools to the polluted Litani River negatively impacts the health of children. Finally, untreated septic tank waste from informal tented settlements (ITSs) is discharged into Bar Elias's wastewater network, eventually reaching the Litani River.

2
MOBILITY CONSTRAINTS AND INTERSECTIONAL CHALLENGES

The fieldwork highlights how the limited physical mobility of persons with disabilities (PWDs), the elderly, the sick, and pregnant women significantly hinders their ability to manage household water responsibilities. Tasks that many take for granted, such as checking the quality of trucked water, operating water pumps, carrying water gallons, and transporting laundry, become particularly difficult for these groups. Additionally, the lack of adapted toilet facilities—such as high bathtubs or special handles—further restricts their ability to perform daily functions. For individuals with weak health or those requiring chronic treatments, their reduced energy and independence further complicate their ability to effectively manage water-related tasks.

For most female respondents with disabilities, their sense of independence remained strong, as they continued to manage personal hygiene, cleaning, and the purchase of bottled water. However, they also reported social isolation and limited activities, largely due to the high cost of living—including the rising costs of water and electricity—and their diminishing purchasing power. This economic strain exacerbated their feelings of unfairness and marginalization. In response, these women expressed a desire for greater inclusion, hoping to be invited to participate in local organizations and social activities that were once accessible to them before the economic crisis. Despite their limited mobility, these respondents viewed outings to purchase water, even while using wheelchairs, as a pleasant and empowering experience. These efforts exemplify social innovation and Adversity-Activated Development (AAD), where individuals and families find transformative and positive ways to respond to adversity[39].



For most female respondents with disabilities, their sense of independence remained strong, as they continued to manage personal hygiene, cleaning, and the purchase of bottled water.

Interestingly, stakeholders often perceive PWDs as using the same water sources as other household members, without recognizing the specific access challenges they face. However, one organization that specializes in working with disabled persons indicated that female PWDs are at a heightened risk of gender-based violence (GBV) and that individuals with disabilities are frequently marginalized in Bar Elias, facing invisibility and a lack of access to vital information and resources, similarly to other areas in Lebanon. The same respondent also shared that there have been incidents of injuries and even deaths among individuals with limited mobility attempting to fill water tanks, further underscoring the urgent need for more tailored support and attention to this vulnerable group.

39. Papadopoulos, R. (2006). *Psychosocial support after adversity: A systemic approach*. International Organization for Migration (IOM).

3 WATER COMMODIFICATION AND ECONOMIC BARRIERS

The household interviews revealed a dramatic and concerning increase in water costs, which have placed a heavy financial burden on families in Bar Elias. In June 2024, the cost of 1,000 liters of trucked water surged to LBP 500,000, a staggering 244 percent increase compared to the price of LBP 145,000 recorded by UNICEF in April 2022[40]. Similarly, the cost of 10 liters of filtered bottled water has risen to LBP 50,000 (previously 1,000 LBP), reflecting a 50-fold increase, while the price of 1.5 liters of branded bottled water for households with newborns has soared to 300,000 LBP—an expense that many families can only afford when absolutely necessary. Moreover, the cost of electricity required to pump low-pressure public water and well water has increased significantly, making up almost 43 percent of the water-related costs—$30 out of a total water bill of $70. This sharp increase in expenses far exceeds the global 3% threshold for household water expenditure[41], placing a severe strain on already financially stretched households.

Additionally, most households reported that they had not paid the annual water flat fee, which amounts to 10,000,000 LBP, due to the absence of a BWE (Bekaa Water Establishment) collector and as a response to the fact that they were not receiving consistent water service. Surprisingly, none of the households mentioned the cost related to this oversight, suggesting that water has become such a limited resource that the annual fee no longer feels relevant when basic water access is not being provided.

The cumulative effect of rising water costs—along with other increasing expenses—has led many households to rely heavily on cheaper alternatives such as tap water or well water, or the most affordable filtered water available. This reliance on lower-quality water options has negative implications on their health, independence, and daily responsibilities. The situation also raises critical questions about how households are managing these high expenses, particularly when compared to their limited income. For many, it appears that their income is derived from remittances and social networks, as many respondents mentioned relying on these sources to cover essential costs.

This scenario is not unique to Bar Elias but mirrors the broader situation across Lebanon, where the rising costs of basic services—coupled with the sharp devaluation of the Lebanese pound—have worsened the financial strain on lower and middle-class households. These families, already facing the diminished real value of their wages and a loss of purchasing power, are now unable to cope with the exorbitant costs of vital services, including water, further exacerbating their daily struggles.

4 LACK OF AUTONOMY AND THE QUEST FOR AGENCY

The compounded effects of economic and social challenges have resulted in a profound sense of diminished autonomy among respondents, causing significant stress. While water shortages and pollution are undeniably serious issues, many respondents view them as secondary to the broader hardships stemming from the deteriorating economic situation, the solid waste crisis, and other overlapping struggles. Faced with these adversities, households have adjusted through various coping mechanisms, such as relocating seasonally to extended family homes with better water access, purchasing trucked or potable water, fetching water themselves, and cutting down on consumption. However, these adjustments are not solutions but rather concessions to a reality in which there are no viable alternatives. Over time, these methods have become the new norm, reflecting an acceptance of limited options and further reinforcing a sense of disempowerment. As a result, respondents

40. UNICEF (2022). UNICEF report: Lebanon's water infrastructure struggles on, but remains on the brink.

41. United Nations Development Programme (UNDP). (2006). *Human development report 2006: Beyond scarcity: Power, poverty and the global water crisis.*

frequently expressed feelings of stress, exhaustion, and emotional fatigue caused by their inability to regain control over their circumstances.

This lack of autonomy is particularly acute for individuals with disabilities, who experience compounded challenges due to economic discrimination and social isolation. Samira, a Palestinian woman with a disability, remarked, "I can't move my legs, but I can move my arms, and I can see and do a job while being seated." Despite her willingness and ability to work, she faces societal perceptions that deem her incapable. High transportation costs and the economic crisis further isolate individuals like Samira, forcing them to prioritize urgent household expenses, such as water, energy, and medicine, at the expense of their independence and participation in society. The erosion of purchasing power has increased dependency, causing frustration and deepening the overall sense of disempowerment.

Despite these barriers, many individuals with disabilities remain determined to assert their independence. Farha, a Lebanese woman with a disability, expressed her pride in being self-reliant, saying, "I don't like to count on anyone; I like to do everything by myself. If I have to, I ask for support from my cousin, whom I asked to find me a job, but he said, 'You don't have to.' He doesn't understand my need to work." Farha's words highlight the resilience of those striving to reclaim their autonomy in a context that continually undermines it.

5
TENSIONS OVER SCARCE RESOURCES: WATER, INEQUALITY, AND SOCIAL CONFLICTS

Leaving the management of scarce water supplies to communities without clear organization fosters significant inequality and rising tensions. Marginalized and low-income households, who often lack the financial and physical resources to pump water, are disproportionately affected. Households located at the beginning of streets typically use pumps to extract all the low-pressure water, leaving others further down without access. This creates localized conflicts that are exacerbated by growing water scarcity and population pressure. Such dynamics highlight how unequal access to essential resources can ignite and intensify social tensions, particularly among vulnerable groups.

The issue is further complicated by recent developments. Stakeholders pointed out that new wells in Ein Al-Bayda and Jbeily, intended to increase water provision for Bar Elias and nearby villages, have been contaminated by sewage. The solar panels installed on these wells to improve efficiency have instead been perceived by many as emblematic of corruption. Furthermore, a proposed wastewater treatment plant in Kafr Zabad has been stalled due to political and sectarian disagreements. Only a handful of stakeholders mentioned an alternative plan that is still awaiting approval, leaving the situation unresolved.

The unequal access to essential resources can ignite and intensify social tensions.

Additional sources of tension arise from the diversion of treated water from the Zahle Wastewater Treatment Plant for Zahle's irrigation needs, leaving Bar Elias farmers with inadequate water for agricultural purposes. This has contributed to stagnation and health risks in the Litani River and deepened a sense of unfairness within the Bar Elias community. Concerns about reduced funding for Water, Sanitation, and Hygiene (WaSH) services for Informal Tented Settlements (ITSs) also pose significant risks. Such cuts could lead to severe environmental and health hazards while triggering both intra- and inter-community tensions, particularly between Syrian refugees and Lebanese residents. Bar Elias, which hosts a large number of ITSs, is particularly vulnerable to these tensions. The ten water points equipped with reverse osmosis (RO) and solar systems near ITSs, initially established to mitigate water access challenges, remain non-operational. If

42. WaSH sector Lebanon. WaSH Sector Alert as of April 30, 2024.

activated, they risk becoming a flashpoint for competition and conflict between impoverished Lebanese households and Syrian refugees.

Competition for jobs and access to water between Syrians and Lebanese was a recurring theme in interviews. Many Lebanese respondents expressed the belief that Syrian refugees worsen water pollution, untreated sewage, and solid waste issues, while also exacerbating safety concerns. Some Lebanese respondents perceived refugees as having better access to water due to illegal connections or aid-supported water trucking services. Others, however, acknowledged the economic contributions of Syrian tenants, such as bolstering commercial activity. Municipal and local authorities were frequently cited as playing a critical role in resolving such water disputes.

The use of contaminated water for irrigation was also highlighted as a significant conflict point, as farmers compete for already limited water resources. Similar to other regions in Lebanon, many Lebanese perceive refugees as contributors to environmental degradation, including water pollution, further fueling prejudices and reluctance to address the shared challenges collaboratively. This widespread perception creates a vicious cycle of tension, deepening divisions and competition over scarce resources.

6 ENVIRONMENTAL CHALLENGES

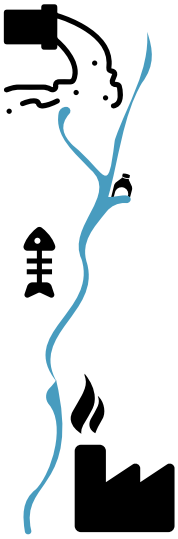
Weather conditions in Bar Elias—heatwaves, heavy rain, and flooding—compound the community's daily struggles. Winter floods and road blockages disrupt the local economy, hinder mobility, and force school closures for safety reasons. The town's basin-like geographic layout exacerbates these issues by allowing rainwater and sewage to mix, leading to severe groundwater contamination.

Once a cherished communal space for relaxation and socializing, the Litani River has transformed over decades into a severe environmental and public health hazard. This shift highlights the principles of environmental justice and equity, as the burdens of pollution disproportionately affect marginalized communities like Bar Elias. Vulnerable populations bear the brunt of this environmental degradation, which erodes public health and well-being.

For instance, Samira, a woman with disabilities, reflects on how the polluted river has robbed her of a nearby natural retreat. She recalls how access to a clean Litani could have provided her with solace and connection to nature. Her inability to afford transportation to Taanayel Lake underscores the compounded effects of economic and environmental challenges on marginalized individuals.

Residents universally attribute the Litani River's degradation to untreated sewage from the Zahle Wastewater Treatment Plant, industrial runoff, agricultural chemicals, and solid waste. Health impacts include respiratory problems, headaches, and increased cancer cases—such as Widad, a cancer survivor who endures the river's odors and pollutants. The community has resorted to survival mechanisms: closing windows, planting fragrant flowers like jasmine to mask the stench, or sleeping on floors during sweltering summer nights without air conditioning.

Many residents express despair over their inability to effect change. Georges poignantly remarked, "Nothing affects us anymore... Our system has gotten used to Litani pollution... We've developed a thick skin for everything." Despite their grievances, families refuse to abandon their homes, fearing the social and economic repercussions of displacement. Yet, there is a deep sense of regret, particularly among parents like Ahmad, who lament passing down polluted land as an inheritance to their children.



Residents universally attribute the Litani River's degradation to untreated sewage from the Zahle Wastewater Treatment Plant, industrial runoff, agricultural chemicals, and solid waste.

The situation has fostered a profound sense of hopelessness and mistrust in authorities. Georges confessed, "I decided to stop talking... Nobody cares about us." Allegations of bribery and corruption plague local authorities, including the municipality, which has failed to address the crisis. The President of the Municipality himself reportedly closes his windows and uses air conditioning rather than addressing the issue. Illegal construction projects by influential individuals further exacerbate inequalities, intensifying feelings of anger and helplessness among residents.

Male respondents, in particular, expressed strong resentment and, at times, aggressive behavior stemming from a sense of injustice. "In the presence of favoritism and absence of equal rule of law, there is no hope in this country," Georges declared. "We are living in a Mafia Country."

While the government has prohibited the use of the Litani River for irrigation, some farmers continue to rely on it, creating conflicts over scarce water resources. Despite protests and movements like "Mabade Litani Yeetelne" ("I don't want the Litani to kill me"), the absence of political will and pervasive corruption have stalled meaningful progress. The Litani Follow-up Committee has attempted to address pollution, but its efforts have achieved limited success, leaving the community feeling abandoned and voiceless.

7
HEATH CONCERNS AND CHALLENGES

Respondents unanimously identified pollution of the Litani River as the primary driver of the alarming increase in cancer cases in Bar Elias. Additionally, households with young children reported health concerns such as diarrhea, skin rashes, and kidney problems. While these conditions could stem from water contamination, weather, food quality, or overall living conditions, they impose significant emotional and financial burdens on families. Rising healthcare costs and deteriorating quality of life deepen these challenges, further straining vulnerable households.

The story of Fatme, a Syrian pregnant woman and mother of five, illustrates the acute risks faced by marginalized groups. Living in a non-residential shelter, Fatme is compelled to fetch water daily—an arduous three-hour task—even during her pregnancy. She and her family must rely on sandy, polluted water from a nearby water point due to their inability to afford potable alternatives. This exposes her, her unborn child, and her young children to severe health risks, perpetuating their vulnerability.
Fatme shared her fears: "I am worried every time my kids drink this unclean water. My daughter and I have kidney problems, and I know it's from the water, but we don't have another option." This situation underscores how socio-economic inequities disproportionately burden women, particularly pregnant and chronically ill individuals, with unsafe water management responsibilities, amplifying physical and mental stress.

Elderly individuals in Bar Elias, despite appearing independent, face significant physical limitations that restrict their ability to manage water needs. Tasks such as carrying water or operating pumps often become insurmountable, forcing reliance on family members and neighbors. This dependence not only creates stress and arguments over water distribution but also exacerbates health risks for elderly individuals with chronic conditions.

For example, Abou Imad, a 77-year-old man with heart disease and high blood pressure, shared the toll of such challenges: "I can't handle stress, especially since I have heart disease and high blood pressure. When I argue, my heart starts beating fast, and I am out of breath." These physical limitations and rising tensions within households highlight the compounded effects of inadequate infrastructure and scarce resources on vulnerable populations.
Finally, the challenges faced by women, children, and the elderly reflect broader systemic inequities that violate the fundamental human right to water. Economic discrimination against individuals with disabilities, geographic disparities in housing, and insufficient infrastructure perpetuate cycles of vulnerability and dependence. These inequities are further compounded by environmental injustices, such as the severe pollution of the Litani River, which disproportionately affects low-income and marginalized communities.

COPING STRATEGIES: INDIVIDUAL AND HOUSEHOLD COPING SYSTEMS

Amid the compounded challenges of water scarcity, economic hardship, and environmental degradation, households and individuals in Bar Elias have devised various coping strategies to navigate their daily struggles. These coping mechanisms, rooted in resourcefulness and resilience, reflect the community's ability to adapt despite limited resources. From managing water at the household level to relying on community and family support, as well as drawing on personal strength, these strategies highlight both the creativity and the inequities inherent in their responses to adversity.

→ The primary coping mechanisms identified among respondents encompass three key strategies:

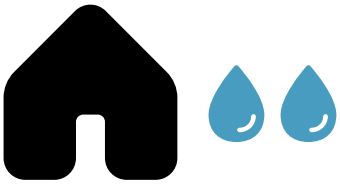
RESOURCE MANAGEMENT

COMMUNITY AND FAMILY SUPPORT

PERSONAL STRENGTH AND RESILIENCE

1 RESOURCE MANAGEMENT

Based on the findings of this study, household resource management can be categorized into two main components:



→ (a) Household provision of alternative water sources, which involves external management efforts to access water, and

→ (b) Household domestic water management, which refers to how households manage the water once it has been accessed.

In contrast to the human-rights approach to water, which mandates that water should be readily accessible and safe for all, families in this context bear the responsibility of sourcing and managing water in diverse ways.

BOX 1
SAFE WATER AS A BASIC HUMAN RIGHT

The human right to water encompasses universal access to an adequate supply of water and sanitation that is safe, acceptable, physically accessible, and financially affordable for all. This right is explicitly and implicitly recognized in conventions such as the Convention on the Elimination of All Forms of Discrimination Against Women, the Convention on the Rights of the Child, the Convention on the Rights of Persons with Disabilities, as well as various regional human rights and environmental treaties. It is encompassed within the right to an adequate standard of living and the right to health outlined in the International Covenant on Economic, Social and Cultural Rights. States, under UN human rights treaties, are obligated to report periodically on their implementation of this right. It also encompasses access to information on water and sanitation issues and hygiene education, without discrimination based on gender. This right is interconnected with other human rights, such as the right to food, life, health, education, adequate housing, and civil and political rights. The Lebanon Water Law No. 192/2020 recognized the right to water under Article 2: All humans have the fundamental right to access their necessary water corresponding to their needs and to the basic requirements for a dignified life. This justifies requiring beneficiaries to pay subscription fees for their use of water. Sanitation, understood as the evacuation and treatment of wastewater, is an element of the right to water. However, full implementation is pending bylaws.

Amid the compounded challenges of water scarcity, economic hardship, and environmental degradation, households and individuals in Bar Elias have devised various coping strategies to navigate their daily struggles. These coping mechanisms, rooted in resourcefulness and resilience, reflect the community's ability to adapt despite limited resources. From managing water at the household level to relying on community and family support, as well as drawing on personal strength, these strategies highlight both the creativity and the inequities inherent in their responses to adversity

(a)
HOUSEHOLD PROVISION OF ALTERNATIVE WATER SOURCES

To address the challenges posed by the inconsistent public water supply, most respondents rely heavily on private informal water sources such as private wells and water trucks, using tap water sparingly for cleaning and hygiene purposes. The public water supply is often intermittent, varying from three days a week to every two days, with some households experiencing month-long disruptions.

For drinking and cooking, the majority purchase bottled water.

For drinking and cooking, the majority of respondents purchase bottled water from local filtering or grocery shops located within a 10-minute walking distance. Despite not having official test results for bottled water, some respondents, like Samira, place their trust in the "consciousness" of local filtering shops. However, some respondents, especially those who cannot afford bottled water, continue to drink tap water, assessing its quality by taste or by the illnesses it causes, as Abou Imad shared. Newborns are often given branded bottled water, while some Syrian refugee families rely on unclean, rusted water trucks offered for free or public water points.

Most respondents expressed concerns over the fluctuating quality of tap water, with it varying from clean to contaminated, sometimes with a noticeable chlorine taste. In contrast, well water is consistently described as unclean, with a sandy, salty, or smelly quality. While tap water is considered the cleanest option, followed by trucked water, well water is seen as the least hygienic.

Despite concerns over the cleanliness and legitimacy of trucked water and filtering shops, many households continue to rely on these sources due to a lack of alternatives. Respondents like Mohamad and Widad shared their experiences of finding contaminants, such as fish in the water reservoir, and their awareness of water being sourced from Chamsin spring without proper permits or quality control. The emergence of new filtering shops since the economic crisis has led some to perceive these businesses as corrupt.

For a few respondents, such as those in Informal Tented Settlements (ITSs), trucked water provided by aid organizations is regarded as potable, tested, and regularly available. This water is seen as the only consistent source of safe drinking water for these communities.

Several households also rely on public water from main house valves or neighbors' taps, while others have water reservoirs connected to neighbors' or landlords' wells. However, most households store tap, well, and trucked water in the same rooftop reservoir, which leads to contamination and complicates the management of clean water. This practice incurs physical, time, and financial costs, with only a few households lacking a water reservoir altogether, particularly those in non-residential shelters or tents in ITSs.

(b)
HOUSEHOLD DOMESTIC WATER MANAGEMENT

Water management within households can be divided into several areas, notably water treatment, adaptive water use, and hygiene practices. Accordingly, respondents employ various strategies to cope with water scarcity and poor water quality.

Water treatment:

Households employ a variety of water treatment methods to address the challenges of accessing safe drinking water. During the winter, some households boil water on a gas stove for showering, cooking, and drinking, depending on their ability to afford gas. In the summer, to reduce gas costs, solar purification methods are utilized. To clean vegetables, salt is commonly used, while laundry is treated with softeners to manage unpleasant odors in the water. Aid organizations also provide chlorine tablets for water purification, and plastic bottles are cleaned and reused for water storage.

However, many respondents express concern about the effectiveness of these methods, particularly due to the uncertainty surrounding the quality of the water. There is also a lack of knowledge about proper water treatment practices, leading to confusion and doubt about whether these methods are sufficient to ensure water safety. Yasma, the daughter and caregiver of Saadiya, a 72-year-old Syrian refugee with chronic health issues and

mobility constraints, shared her uncertainty, asking, "I put water in plastic bottles in the sun for three days, and it turns yellow. What do you think? Is it drinkable?" This highlights the challenges that many households face in trying to purify water without clear guidance or reliable resources.

Adaptive water use:

Households have developed various adaptive water use strategies to cope with the challenges of water scarcity and inconsistent supply. One common approach is scheduling household tasks during periods when tap water is available, with some respondents staying up late at night or waking early in the morning to pump water. When access to a water reservoir is not possible, designated containers are used for personal water storage. To conserve water, households often reduce the amount used for various tasks, such as cleaning with just one bucket of water or cutting back on the frequency of house cleaning and laundry.

In the absence of water, some households fill gallons with tap water during supply periods to store for later use. Despite limited options, certain households continue to use rusted washing machines due to the lack of alternatives. Individuals with disabilities have also adjusted cleaning methods to suit their specific needs. For children's recess, a "bucket of water for showering" is sometimes used as an alternative to a swimming pool. To save on trucked water costs, some families relocate to other homes in the summer to access well water for seasonal laundry tasks, such as washing winter sheets, curtains, and carpets. Additionally, some families live together with their married adult children to share expenses and manage their water needs more effectively, helping them survive the financial strain caused by the ongoing economic crisis.

Hygiene practices:

Hygiene practices in households have become a source of significant adaptation, often relying on unconventional and resourceful methods to cope with water scarcity. Small buckets are used for showering and flushing toilets, while unclean well water is often employed for cleaning and hygiene tasks. For the elderly, the sick, or family members with disabilities, showering is made even more challenging, with personalized adaptations like placing small wooden chairs in the bathtub to assist in getting in and out. As Farha shared, "One time, while showering, I almost fell and broke my shoulder. I can't ask my father to change the bathtub; it will cost him money." Showering is done less frequently, especially when water is limited, and social outings are minimized after showering to avoid the need for an additional wash.

These hygiene practices lack dignity, particularly for individuals with disabilities, and place immense physical and emotional strain on caregivers. The burden of personal hygiene often falls on family members, such as wives or daughters, demanding considerable effort, patience, and commitment. This dynamic can create frustration and strain relationships, affecting various aspects of life, from social to professional to health. The lack of adapted shower and toilet facilities exacerbates the challenges for individuals with limited mobility, contributing to accidents and a loss of independence.

Showering is done less frequently, and social outings are minimized.

For elderly or sick individuals who need to pump water late at night or early in the morning, the physical exhaustion is significant. The reduced amount of water used for cleaning or showering can have a direct impact on hygiene, sometimes leading to stigmatization due to unclean clothes or homes. As Fatme stated, "It's true that I don't have clean water, but I make sure my kids' clothes are clean." These daily responsibilities, in addition to the demands of family life, become overwhelming and inequitable, especially for low-income households and women. The sentiment of resignation is common, with many respondents expressing helplessness and acceptance of their difficult circumstances. Over time, such adaptations become normalized, and water conservation strategies are viewed as an inevitable part of their reality. For many, bottled water becomes the norm, with tap water reserved as a last resort when bottled water is unaffordable. This constant need to economize, while managing limited household income, contributes to continuous stress for both women and men, underscoring the pervasive sense of resignation and disillusionment with the environmental crisis and political system.

2
COMMUNITY AND FAMILY SUPPORT

Support systems in Bar Elias are essential in helping households manage water-related challenges, and these systems primarily rely on neighbors, nuclear and extended families, and friends. Respondents emphasized the critical role of shared resources, particularly during water shortages, with neighbors providing free access to water, operating pumps, offering physical help in transporting water, and providing financial assistance. Family members, especially those abroad, also play a significant role, with many households depending on remittances or financial support from relatives. Ramadan charity donations from local youth clubs and organizations further support those in need. For Palestinian households, financial assistance from UN agencies provides a crucial lifeline, while Lebanese households report minimal assistance from the Ministry of Health or from other state institutions.

However, support systems are not without challenges. Some individuals, particularly those with disabilities, reported dependence on male family members or neighbors for harder tasks and financial support, though a few expressed reluctance to accept external help. This is often due to fears of exploitation or interference, particularly for women. Nidal's experience illustrates how exclusion from support systems can heighten vulnerability to abuse and neglect. "My neighbor wanted more from me—referring to sexual favors—in exchange for his help in providing well water. I refused and learned how to protect myself." Many respondents, especially those with health conditions or disabilities, have refrained from seeking aid from external organizations due to a lack of trust and repeated disappointments, preferring to maintain their dignity and self-sufficiency despite difficult circumstances.

Mohamad states, "We have had enough of the humiliation due to our illness. We do not want to embarrass ourselves more and beg for help anymore." This personal experience echoes the strong role of moral and religious beliefs and social values (cognitive social capital)[43] in the support system.

Religious beliefs and social values are integral to the support network in the community, providing individuals with the strength to accept adverse conditions and motivating them to support others. The informal safety net, based on these values, includes services and goods such as food, clothes, money, and access to water. However, while these networks are vital for survival, they also create dependency and sustainability risks. The informal nature of this support often fails to address the root causes of water scarcity and can lead to exploitation, as demonstrated by the case of female heads of household being asked for sexual favors in exchange for assistance. Despite these risks, the value of informal support systems is significant, with people relying on them out of necessity while remaining silent about their struggles due to a sense of desperation and helplessness.

Ultimately, support systems are deeply embedded in the daily lives of households in Bar Elias, intertwined with water-related tasks and responsibilities. As Abou Imad stated, "My brother has disabilities (hearing, visual, and mental disabilities). Even if he wastes water and is stubborn, I will always help him, by making sure he has pumped water in his reservoir and other daily tasks." This example highlights the often unacknowledged but essential role of social support in coping with water challenges and the profound economic and emotional value these networks hold.

There is an unacknowledged but essential role of social support in coping with water challenges as well as a profound economic and emotional value.

43. Dasgupta, P., & Serageldin, I. (Eds.). (2000). *Social capital: A multifaceted perspective*. Washington, D.C. The World Bank - Uphoff definition of cognitive social capital is based on mental processes and psychology in the domain of ideas and includes particularly norms, values, attitudes, and beliefs.

3
PERSONAL STRENGTH AND RESILIENCE

Despite facing a range of vulnerabilities, such as age, physical conditions, economic challenges, and other adversities, the majority of interviewees show remarkable independence and resilience in managing water-related issues. Two women with disabilities, both using wheelchairs, exemplify this perseverance as they navigate physical barriers to access bottled water, with one finding innovative ways to reach her apartment. Despite living with a chronic illness, Widad continues to carry out her daily responsibilities, although her physical constraints due to treatment prevent her from filling her water tank or carrying heavy water gallons. "I can no longer take the stairs to fill the tank, and I can't carry water gallons because of my surgery and my treatment," she explained. As for Abou Imad, despite his age and heart disease, he manages not only his own water needs but also those of his brother, who has profound disabilities, while also handling disputes with neighbors over water distribution.

Nour, an eight-year-old Syrian refugee orphan, shows exceptional resilience by spending at least three hours each day fetching water from a rusted truck. Despite his physical challenges, such as sore arms and the emotional strain of his situation, he remains committed to his studies, achieving a grade of 70/100, and dreams of a better future. His story highlights the emotional and physical toll of water collection, but also his unyielding determination to improve his circumstances.

The study did not specifically target extreme poverty, but the case of Nidal sheds light on a marginalized group of Lebanese citizens who are excluded from both national social safety nets and refugee aid services. Nidal, a single woman with a disability, finds herself in a particularly vulnerable position, struggling with access to basic rights, including water. Despite the challenges, Nidal remains determined, attending intensive cooking training and fighting for a job with the hope of overcoming her circumstances.

Additionally, individuals with chronic diseases, disabilities, or advanced age face significant physical barriers, unable to carry water, operate pumps, or access water storage areas due to limited mobility. These stories demonstrate not only personal strength and determination but also expose the underlying struggles, injustices, and violations of basic human rights that affect people facing such challenges. The persistence of these individuals in managing water needs highlights both their remarkable resilience and the urgent need for structural change to address the inequities they face.

Individuals with chronic diseases, disabilities, or advanced age face significant physical barriers, unable to carry water, operate pumps, or access water storage areas.

WATER INJUSTICE: A GENDERED AND INTERSECTIONAL LENS ON INEQUALITY

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1 AN INTERSECTIONAL DIMENSION TO WATER INJUSTICE

Ethnographic research has illustrated the significant role that water plays in shaping identities, fostering social relationships, and preserving cultural heritage. For example, studies have demonstrated that water-related rituals in Fijian communities, both within Fiji and among diaspora populations in locations such as New York, serve to reinforce cultural identity and strengthen communal bonds[44]. In several cultures, water is not merely a physical resource but is imbued with personhood, reflecting its profound social and spiritual significance. In Maori culture, for instance, water bodies are viewed as ancestors and living entities[45]. Sikkink's study further highlights the intricate relationship between humans and water, specifically through the yaku cambio ritual in the Bolivian community of San Pedro de Condo. This ritual extends beyond the physical exchange of water and operates as a symbolic representation of communal cohesion and social order. It involves the collection of water from various sources—lakes, springs, and rivers—which is then mixed and redistributed among community members, thereby symbolizing the interconnectedness of the community and their collective responsibility in managing shared resources[46].

A closer examination of water-related challenges within specific groups reveals that women disproportionately bear the burden of water-related hardships due to their traditional roles in household water management and collection. In areas experiencing water scarcity, women often spend significant amounts of time collecting water, which can impede their access to education and employment opportunities[47]. Additionally, water contamination poses serious health risks to women, particularly in relation to menstrual health, pregnancy, and childbirth. Traditional gender roles often restrict women's access to resources and their participation in decision-making processes both within households and communities[48]. Insufficient access to clean water and poor water quality can lead to health complications such as infections, birth defects, and maternal mortality[49], alongside the physical and emotional strain of securing safe water. In Jordan, for example, Syrian refugee women have been found to suffer higher rates of urinary tract infections and other waterborne diseases due to limited access to clean water[50]. Similarly, in Bolivia, women with unstable access to water markets and shared networks experience heightened emotional stress related to water insecurity, illustrating how political and economic inequalities exacerbate their suffering[51].

Children, particularly those under the age of five, are highly vulnerable to waterborne diseases and malnutrition, both of which are worsened by water scarcity and pollution[52]. Research on childhood development underscores that early exposure to poor environmental conditions, including contaminated water, can have lasting impacts on health and cognitive development[53]. Water-related challenges can also impede children's education, as responsibilities such as water collection or illness—such as diarrhea—can limit school attendance[54].

Elderly individuals are similarly at increased risk of health complications due to water pollution, with weakened immune systems and greater susceptibility to diseases. Theories on aging and social

44. Kaplan, M. (2016). Nation and conservation: Postcolonial water narratives in Singapore rituals. *Journal of the Malaysian Branch of the Royal Asiatic Society*.

45. Harmsworth, G., & Awatere, S. (2013). Indigenous Māori Knowledge and Perspectives of Ecosystems. In J. R. Dymond (Ed.), *Ecosystem Services in New Zealand: Conditions and Trends* (pp. 274-286). Manaaki Whenua Press.

46. Sikkink, L. (1997). Water and Exchange: The Ritual of Yaku Cambio as Communal and Competitive Encounter. *American Ethnologist*.

47. Ray, I.(2007), Women, water, and development. *Annual Review of Environment and Resources*.

48.Connell, R. W. (2002), *Gender*. Polity.

49. Schwerdtle, P. N., Bowen, K., & McMichael, C. (2018).The health impacts of climate-related migration.

50. Doocy, S., Lyles, E., Akhu-Zaheya, L., Burton, A., & Burnham, G. (2016). Health service access and utilization among Syrian refugees in Jordan. *International Journal for Equity in Health*.

51. Amber, W., & Beresford, M. (2018). The economic anthropology of water.

52. Prüss-Ustün, A., Wolf, J., Bartram, J., Clasen, T., Cumming, O., Freeman, M. C., & Medlicott, K. (2019). Burden of disease from inadequate water, sanitation, and hygiene for selected adverse health outcomes: An updated analysis with a focus on low- and middle-income countries.

53. Bronfenbrenner, U. (1979).The ecology of human development: Experiments by nature and design.

54. Komarulzaman, A., De Jong, E., Smits, J. (2019). Effects of water and health on primary school enrolment and absenteeism in Indonesia.

roles emphasize how environmental stressors, including water quality issues, can disrupt the social and physical roles of older adults, diminishing their quality of life and social inclusion[55].

Individuals with disabilities face additional barriers in accessing clean water due to mobility challenges and the absence of infrastructure designed to accommodate their needs. According to the social model of disability, disability arises not from individual impairments but from societal barriers and inadequate provisions. These barriers often prevent persons with disabilities from fully participating in water collection, sanitation, and water management activities[56].

The intersectional dimension of water-related challenges becomes apparent when examining how various social categories—such as gender, age, disability, and socio-economic status—interact to exacerbate inequalities in access to clean water and sanitation. Women, for instance, are disproportionately burdened by water scarcity due to their traditional roles in household water collection. In many societies, these roles are not only time-consuming but also limit women's opportunities for education, employment, and overall socio-economic mobility. The intersection of gender with water scarcity becomes even more complex in contexts where women also experience poor water quality, which can have dire health implications, including increased rates of infections, complications during pregnancy and childbirth, and maternal mortality. Moreover, these health risks are often compounded by gendered expectations around caregiving, with women being expected to manage the care of sick family members, further straining their physical and emotional well-being. Similarly, the burden of water-related challenges is intensified for women with disabilities, as they often face additional barriers to accessing clean water, such as inadequate infrastructure and mobility challenges. In these cases, the intersection of gender and disability heightens the difficulty in securing safe water, illustrating how societal barriers and limited provisions disproportionately impact these individuals.

Therefore, a human rights-based approach to water and sanitation should emphasize the rights and responsibilities of both water users and authorities. Water users are entitled to safe, affordable water and sanitation services, access to water sources, protection from disconnection, information on roles and responsibilities, access during emergencies, and social service assistance. In turn, users are responsible for avoiding the pollution or wasting of water, cooperating with water services, holding authorities accountable, paying equitable fees, complying with water usage restrictions during shortages, and ensuring proper sanitation practices. Authorities have the right to regulate water access, ensure adherence to standards, select and oversee operators, prevent substandard water distribution, collect payments, cut off supply for non-compliance, pursue violations, administer subsidies, and set prices based on users' ability to pay. Their duties include prioritizing personal and domestic water uses, safeguarding water quality, creating a legal framework to encourage investment, adopting action plans, securing funding, maintaining infrastructure, identifying and assisting underserved populations, promoting user participation, and overseeing water and sanitation quality.

2
THE POLITICAL DIMENSION TO WATER INJUSTICE

Our fieldwork showed that stakeholders and households perceive the municipality as the primary authority on water, followed by mukhtars, the governor, and lastly, the Bekaa Water Establishment (BWE). This highlights the prominent role municipalities and local authorities play in addressing fundamental needs in Bar Elias and across Lebanon. Although the responsibility for water and sanitation services legally lies with the Regional Water Establishments, municipalities often intervene to cover the gaps left by these weaker institutions. Currently, the dissolution of the Bar Elias municipality has created a considerable gap in daily water management. The BWE's role is mostly tied to billing, rather than managing the water supply, showcasing a lack of responsibility for maintaining the water system. The failure to pay the freshwater fee reflects a lack of engagement and initiative from households toward

55. Silverstein, M., Norella M. Putney, N.M., Gans, D., Bengtson, V. L. (2008). *Handbook of theories of aging*. Second Edition. Springer Publishing Company.

56. Oliver, M. (1990). The politics of disablement. Macmillan Education UK.

the water authorities, which is understandable given the inconsistent water services. This contributes to a significant amount of non-revenue water, which diminishes the effectiveness and capacity of the water authorities in managing and maintaining water resources. While access to water is a fundamental right, it is also the responsibility of users to pay for the services they receive. This mutual accountability is crucial for sustainable water management.

A human rights-based approach to water emphasizes the rights of users to be informed and involved in water management. However, many respondents feel neglected, with Georges saying, "Nobody cares; even if we complain, nothing changes." Some accuse the municipality of favoritism and corruption, which leads to unequal water access. Widad adds, "If you know someone at the municipality, you get better access to water, you do whatever you want." The lack of transparency regarding water quality and services results in confusion and harmful practices. For example, unfounded fears about the cleanliness of tap water lead to unnecessary bottled water purchases. Additionally, insufficient monitoring of water treatment methods used in local filtration shops can pose health risks, as mentioned by several stakeholders. People may also unknowingly use methods that do not effectively purify water, leading to further health concerns. Yasma notes, "I put the water in plastic gallons in the sun for three days. […] I do this to save on gas costs, especially in the summer." The effectiveness of such practices depends on resources like gas for boiling water and chlorine tablets for disinfection. Without these, even basic water purification methods fail, leaving individuals at risk of consuming unsafe water.

The majority of respondents are unaware of water issues, relying on informal networks and neighbors for information. Few respondents recall receiving any official communication, such as a one-time SMS from the municipality about water quality. Men, mukhtars, and neighbors are the main sources of water-related information. Only two stakeholders mentioned occasional town hall meetings in Bar Elias to discuss community concerns regarding water quality. Despite these efforts, ongoing governance challenges and resource allocation issues persist.

Only Widad seemed aware of the BWE and local water projects, reflecting a broader lack of reliable information and weak community participation in water discussions. Fatme expressed regret at losing access to water quality information after moving from an informal tented settlement to non-residential shelters. Water committees and community mobilizers introduced by an international NGO in informal tented settlements were mentioned by one stakeholder.

We see a lack of reliable information and weak community participation in water discussions.

A stakeholder noted the role of religious leaders in raising awareness about water through Friday sermons. The Lebanese Agriculture Research Institute (LARI) in Tel Amara was also highlighted for its work testing tap water quality and advising on food contamination and public health concerns. Despite these initiatives, civil society and households in Bar Elias remain largely uninformed about water issues, rarely engaging in organized water discussions except during major water crises. Small-scale complaints and a local environmental committee (mentioned by only one stakeholder) have failed to lead to significant changes, increasing frustration and a sense of hopelessness within the community.

The assertion by many households that water sold by truck vendors is sourced from the public network or springs like Chamsin raises important questions about the accountability of water authorities. Their role in either ignoring violations or failing to regulate these practices contributes to the persistence of this informal water market, which becomes a normalized and accepted system. This leaves the population dependent on unregulated private vendors. Similar to other regions, Bar Elias demonstrates how communities rely on illegal water extraction and informal vendors to meet their needs. These issues warrant further investigation and regulation beyond the scope of this study, but they directly impact household lives and their right to safe, clean, and affordable water.

3
THE GENDERED BURDEN OF WATER POVERTY

Interviews affirmed that women play a traditional role in managing household water, including tasks like fetching, storing, and purifying water, cooking, cleaning, and maintaining hygiene for family members with limited mobility, such as spouses and children. Women, including mothers, sisters, and sisters-in-law, are primarily responsible for water management, a role that demands significant physical, mental, and emotional endurance. Many of them justify this by noting that men are usually away working throughout the day.

Men typically handle the physically demanding tasks associated with water, such as pumping and managing the supply, along with the financial responsibilities, like purchasing bottled water, paying for water truck services, and settling the annual water bill. They also communicate with water authorities. Male children, across all interviews, are often involved in fetching water. Both women and boys typically spend between one and three hours collecting water, regardless of seasonal conditions, such as summer heat or winter rain. Parents often assign this responsibility to boys, even if they are attending school. The physical strain and time involved vary, with refugee boys frequently sourcing water from unreliable places, while Lebanese and Palestinian boys generally purchase water from filtration shops.

The higher water needs of women, particularly for hygiene due to physical labor and the need for frequent showers, are acknowledged. There is also an opposing view that girls and boys need similar amounts of water, as they shower with comparable frequency. When asked about water-fetching duties, only boys reported that they are responsible for the task, with one Syrian boy noting that it is his duty, though his sister assists, indicating that water-fetching tasks are typically assigned to boys within families.

Both male and female respondents who live alone or with limited mobility often receive help from neighbors and family members to meet their water needs. Women shared instances where men (husbands, fathers, brothers) argued or caused conflict over water issues, while women generally preferred to resolve such matters without creating tension or conflict.

Women with disabilities, chronic illnesses, or pregnancy are expected to continue managing household water and other tasks, even without help. Widad shared, “Nobody feels for you. When I had cancer and was devastated by the chemo treatment, I still had to do all the housekeeping and water management by myself with no help from my family (father and brother).” When husbands are sick, women bear the additional responsibility of managing all household chores, including water-related tasks and childcare. Ibtisam, the wife of Mohamad, remarked, “I do both the man and woman’s roles; water is an additional stress on top of my existing responsibilities.”

Women with disabilities, chronic illnesses, or pregnancy are expected to continue managing household water and other tasks.

Women also play a significant role in water conservation efforts. Many women are conscious of their water usage, turning off taps to ensure equitable access for the community. Widad explained that her awareness of previous water shortages taught her to be more mindful of her water consumption, a lesson she learned from her grandmother, who encouraged thoughtful water sharing. However, there are disparities, as some respondents mentioned women who waste water, exacerbating scarcity issues, especially during shortages, which negatively affects the whole community.

This gendered division of labor, deeply entrenched in cultural norms and patriarchal systems, places a heavy burden on women, affecting their health, well-being, and economic opportunities. While none of the interviewed women have jobs, the study did not find evidence of the impact of labor-intensive, time-consuming coping strategies on household economic conditions. At the same time, all the women with disabilities expressed their desire to work but faced obstacles due to employers' perceptions of reduced capacity, leading to economic discrimination.

The non-monetary costs of these water management tasks, including the time, physical labor, and stress involved, are significant and often overlooked. The "invisible labor" of women in managing household water is crucial for family survival, yet it remains unrecognized and unsupported by societal structures[57].

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57. Daniels, A. K. (1987). Invisible work. *Social Problems.*

CONCLUSION AND RECOMMEN-DATIONS

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In conclusion, the findings of this study highlight the complex and multifaceted nature of water issues, which intersect with a variety of other critical factors such as health, the environment, social dynamics, economic conditions, political influences, and more. It is evident that water-related challenges cannot be fully understood or addressed in isolation, as households and individuals facing water scarcity are also grappling with numerous other persistent and systemic issues that impact their everyday lives.

People often struggle to articulate the specific impacts of water scarcity because they have grown accustomed to these hardships; their coping mechanisms have become ingrained as a "normal" way of life. This normalization of adversity calls for a deeper interpretation that goes beyond surface-level descriptions, allowing for a better understanding of the underlying challenges that households face in managing their water supply.

The challenges and coping strategies related to water are intricately linked.

The study underscores that the challenges and coping strategies related to water are intricately linked. Households must navigate numerous barriers, from accessing and storing water to dealing with the added difficulties of their coping mechanisms. These water-related struggles are further intensified by individual and collective challenges, such as physical health problems, economic stress, and social dynamics.

Addressing the lived experiences of households facing water issues requires a comprehensive, multidimensional approach, with interventions at micro, meso, and macro levels. Solutions must encompass the entire water management cycle, from treatment and storage to distribution, in addition to enforcing regulations that govern water use and safeguard against environmental degradation.

Additionally, any efforts to improve water management in Lebanon must consider the needs of the entire population that relies on shared water resources. It is impossible to effectively address water issues for one segment of the population without understanding the broader context in which these resources are used. Similarly, isolated efforts to treat wastewater in one village or regulate a single industry will fall short if neighboring regions continue to contribute to pollution unchecked.

Ultimately, a coordinated, comprehensive, and integrated approach is essential, involving all relevant ministries and stakeholders. Addressing water issues in Lebanon requires not only improvements in water quality, quantity, and distribution, but also robust systems for billing, information dissemination, public participation, environmental protection, and law enforcement. Only through such a holistic, systemic, and collaborative effort can sustainable solutions be found to address the complex water challenges faced by households and communities. Therefore, at the national level, to improve water management and ensure equitable access, it is crucial to implement Water Law No. 192/2020 by developing bylaws that recognize water as a national resource and public good. Private water suppliers should be regulated to prevent monopolies, ensure water quality, and protect citizens from excessive costs. The National Water Authority must be activated to improve the country's water resource management, adding key stakeholders such as the Ministry of Social Affairs and civil society groups focused on women and disabilities, to ensure inclusive decision-making. The National Water Sector Strategy (NWSS) should be revised from a human rights perspective to ensure social equity and the financial sustainability of water services. This is vital to addressing geographical disparities, promoting fairness in water distribution, and ensuring affordable access to basic water needs for low-income and vulnerable households through a tiered pricing system.

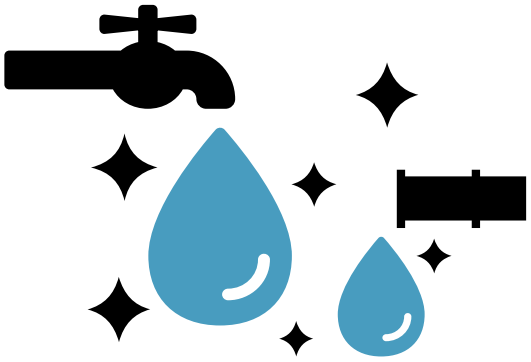
The National Authority of the Litani River (LRA) should transparently report on the progress and challenges of de-pollution efforts and provide updated information on pollution sources. Legal action against water and environmental crimes must be enforced.

Investing in alternative water sources and gender-sensitive policies is essential, alongside integrating healthcare initiatives to address waterborne diseases and ensure access to clean water for vulnerable populations. Special programs should support the elderly, people with disabilities, and children, including providing access to water, education, and socio-economic resources.

In addition to implementing Law 220/2000 and the National Social Protection Strategy to protect the rights of persons with disabilities and vulnerable groups, there should be a focus on fostering inclusion and economic opportunities to promote greater independence.

At the regional level, Regional Water Establishments (RWEs) should prioritize equitable water distribution and quality monitoring across all neighborhoods, upgrading infrastructure to meet local needs. Local water distribution systems should be organized to protect vulnerable groups, and water sources should be safeguarded from pollution through rigorous enforcement of laws. Efforts to prevent conflicts or health crises arising from water scarcity or access should be prioritized, with the environmental impact of water extraction, social dynamics, and non-residential housing conditions thoroughly examined. Clear, regular, and reliable communication about water issues, including management roles, water quality, and quantity, must be accessible to all, including those with disabilities. An inclusive, bottom-up approach to community participation should be implemented. Capacity-building and coaching for solid advocacy campaigns on water pollution and challenges should empower communities to assert their basic human rights.

Finally, additional specific recommendations focus on immediate actions as well as long-term strategies aimed at improving water access, quality, and governance.



Investing in alternative water sources and gender-sensitive policies is essential, alongside integrating healthcare initiatives to address waterborne diseases and ensure access to clean water for vulnerable populations.

RECOMMENDATIONS FOR NGOS AND CIVIL SOCIETY ORGANIZATIONS

→ **Strengthening community awareness and advocacy**

NGOs could launch community-driven education campaigns to raise awareness about water quality, treatment methods, the importance of sustainable water use, and effective water purification techniques.

→ **Facilitate community water committees**

NGOs could assist in forming or strengthening local water committees that empower communities to take ownership of water-related issues. These committees can serve as a platform for coordinating water distribution, addressing complaints, and advocating for their rights to water services.

→ **Promote gender-sensitive local water management**

A gender-responsive approach should be integrated into water management programs, ensuring that women's traditional roles in water collection, purification, and distribution are recognized, supported and more equally distributed within the domestic economy.

→ **Conduct water quality monitoring**

Partner with local authorities to establish community-driven water quality monitoring systems, allowing residents to report and track issues related to contamination or irregular water supply.

→ **Lobby for the enforcement of water laws**
Advocate for the enforcement of existing water-related laws and regulations, particularly regarding the illegal extraction of water and the unregulated sale of trucked water. NGOs can play a key role in pushing for the inclusion of local populations in decision-making processes related to water governance.

RECOMMENDATIONS FOR THE STATE AND PUBLIC ENTITIES

→ **Reinstate municipal functions**

Given the dissolution of the Bar Elias municipality, efforts should be made to quickly reestablish municipal services following a new municipal election, especially water management, to ensure that the community has local representation and accountability for water provision.

→ **Enforce accountability for regional water establishments**

Regional Water Establishments (RWEs) should be held accountable for their role in water and wastewater management. This includes improving their response time, ensuring that water services are equitable, and addressing any infrastructure issues that lead to water shortages. The Bekaa Water Establishment (BWE) should expand its responsibilities beyond bill collection to include proactive water management, such as establishing regular communication and interaction with communities, maintaining existing infrastructure, and ensuring efficient distribution. This could be achieved by improving the BWE's internal capacity, as well as enforcing regulations on water extraction and distribution.

→ **Regulate water trucking**

The state should impose stricter regulations on private water vendors to prevent the extraction of water from public sources without proper permits. Additionally, it should ensure that the quality of water sold by these vendors is monitored to prevent contamination and unsafe drinking water.

→ **Increase transparency in water governance**

Local authorities and water providers should ensure that information about water supply, quality, and pricing is readily available to the public. This includes regular communication about water issues, as well as clear channels for residents to report concerns and participate in decision-making processes related to water governance.

REFERENCE LIST

- Adams, J. (1998). Structural adjustment, safety nets, and destitution. *Economic Development and Cultural Change*, 46(2), 403-420.
- Amber, W., & Beresford, M. (2018). The economic anthropology of water. *Economic Anthropology*, 5(2), 168-182. https://doi.org/10.1002/sea2.12153
- Arnall, A., Furtado, J., Ghazoul, J., & De Swardt, C. (2024). Perceptions of informal safety nets: A case study from a South African informal settlement. https://www.researchgate.net/publication/227610923_Perceptions_of_informal_safety_nets_A_case_study_from_a_South_African_informal_settlement
- Bivins, A. W., Sumner, T., Kumpel, E., Howard, G., Cumming, O., Ross, I., Nelson, K., & Brown, J. (2017). Estimating infection risks and the global burden of diarrheal disease attributable to intermittent water supply using QMRA. https://pubmed.ncbi.nlm.nih.gov/28582618/
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press. https://www.hup.harvard.edu/books/9780674224575
- Central Administration of Statistics (CAS) of Lebanon & International Labour Organization (ILO). (2022). *Lebanon follow-up Labour Force Survey January 2022*. https://www.ilo.org/publications/lebanon-follow-labour-force-survey-january-2022
- Choueiri, Y., Lund, J., London, J. K., & Spang, E. S. (2022). (Un)affordability of informal water systems: Disparities in a comparative case study in Beirut, Lebanon. *Water, 14*(17), 2713. https://www.mdpi.com/2073-4441/14/17/2713
- Connell, R. W. (2002). *Gender*. Polity. https://openlibrary.org/books/OL15505869M/Gender
- Daniels, A. K. (1987). Invisible work. *Social Problems, 34*(5), 403-415. https://doi.org/10.2307/800538
- Dasgupta, P., & Serageldin, I. (Eds.). (2000). *Social capital: A multifaceted perspective*. World Bank. http://documents.worldbank.org/curated/en/663341468174869302/Social-capital-a-multifaceted-perspective
- Devereux, S. (1999). 'Making less last longer': Informal safety nets in Malawi.
- Doocy, S., Lyles, E., Akhu-Zaheya, L., Burton, A., & Burnham, G. (2016). Health service access and utilization among Syrian refugees in Jordan. *International Journal for Equity in Health, 15*(1), 1-12. https://doi.org/10.1186/s12939-016-0399-4
- Dubreuil, C. (2006). *The right to water: From concept to implementation*. World Water Council. https://www.worldwatercouncil.org/en/publications/right-water-concept-implementation
- Government of Lebanon. (2018). *Lebanon Water Law: Part 2, Chapter 1, Article 14; Part 3, Chapter 1, Articles 31-32*. Beirut: Government of Lebanon.
- Harmsworth, G., & Awatere, S. (2013). Indigenous Māori knowledge and perspectives of ecosystems. In J. R. Dymond (Ed.), *Ecosystem services in New Zealand: Conditions and trends* (pp. 274-286). Manaaki Whenua Press. https://www.landcareresearch.co.nz/assets/Discover-Our-Research/Environment/Sustainable-society-policy/VMO/Indigenous_Maori_knowledge_perspectives_ecosystems.pdf

– Hoag, C. (2019). Water is a gift that destroys: Making a national natural resource in Lesotho. *Economic Anthropology, 6*(2), 183-194. https://ideas.repec.org/a/bla/ecanth/v6y2019i2p183-194.html

– Huberts, A., Palma, D., Bernal García, A. C., Cole, F., & Roberts, E. F. S. (2023). Making scarcity "enough": The hidden household costs of adapting to water scarcity in Mexico City. *PLOS Water*. https://sites.lsa.umich.edu/mexican-exposures-spanish/wp-content/uploads/sites/555/2023/03/EnoughWater.pdf

– Kaplan, M. (2016). Nation and conservation: Postcolonial water narratives in Singapore rituals. *Journal of the Malaysian Branch of the Royal Asiatic Society, 89*(1), 21-40. https://www.researchgate.net/publication/311578450_Nation_and_Conservation_Postcolonial_Water_Narratives_in_Singapore_Rituals

– Komarulzaman, A., De Jong, E., & Smits, J. (2019). Effects of water and health on primary school enrolment and absenteeism in Indonesia. *J Water Health, 17*(4), 633-646. https://doi.org/10.2166/wh.2019.044

– Meehan, K. (2013). Disciplining de facto development: Water theft and hydrosocial order in Tijuana. *Environment and Planning D: Society and Space, 31*(2), 319-336. https://www.academia.edu/15333603/Disciplining_de_facto_development_water_theft_and_hydrosocial_order_in_Tijuana

– Ministry of Environment, UNHCR, UNICEF, UNDP. (2020). *State of the environment and future outlook: Turning the crisis into opportunities*. Lebanon. https://www.unicef.org/lebanon/media/7161/file/SOER_Report_EN.pdf

– Moser, C. O. (1998). The asset vulnerability framework: Reassessing urban poverty reduction strategies. *World Development, 26*(1), 1-19.

– Oliver, M. (1990). *The politics of disablement*. Macmillan Education UK. https://books.google.es/books/about/The_Politics_of_Disablement.html?id=S8BIAAAAYAAJ&redir_esc=y

– Pacheco-Vega, R. (2020). Human right to water and bottled water consumption: Governing at the intersection of water justice, rights, and ethics. In F. Sultana & A. Loftus (Eds.), *Water politics: Governance, justice, and the right to water* (pp. 113-128). Routledge. https://www.researchgate.net/publication/337064155_Pacheco-Vega_Raul_2020_Human_Right_to_Water_and_Bottled_Water_Consumption_Governing_at_the_Intersection_of_Water_Justice_Rights_and_Ethics_In_Farhana_Sultana_and_Alex_Loftus_Eds_Water_Politics_Governa

– Papadopoulos, R. (2006). *Psychosocial support after adversity: A systemic approach*. International Organization for Migration (IOM). https://www.iom.int/sites/g/files/tmzbdl486/files/mhpss/annex/iommhpssannex3_20200512.pdf

– Prüss-Ustün, A., Wolf, J., Bartram, J., Clasen, T., Cumming, O., Freeman, M. C., ... & Medlicott, K. (2019). Burden of disease from inadequate water, sanitation, and hygiene for selected adverse health outcomes: An updated analysis with a focus on low- and middle-income countries. I*nternational Journal of Hygiene and Environmental Health, 222*(5), 765-777. https://doi.org/10.1016/j.ijheh.2019.05.004

– Ranganathan, M. (2014). Mafias in the waterscape: Urban informality and everyday public authority in Bangalore. *Water Alternatives, 7*(1), 89-105. https://www.researchgate.net/publication/263652518_'Mafias'_in_the_Waterscape_Urban_Informality_and_Everyday_Public_Authority_in_Bangalore

– Ray, I. (2007). Women, water, and development. *Annual Review of Environment and Resources, 32*, 421-449. https://doi.org/10.1146/annurev.energy.32.041806.143704

– REACH Initiative, & United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA). (2024). *Multi-sectoral needs assessment: Lebanese households in Lebanon*. https://www.unocha.org/publications/report/lebanon/multi-sectoral-needs-assessment-lebanese-households-lebanon-march-2024

– Schwerdtle, P., Bowen, K., & McMichael, C. (2018). The health impacts of climate-related migration. *BMC Medicine, 16*, 1. https://doi.org/10.1186/s12916-017-0981-7

– Sikkink, L. (1997). Water and exchange: The ritual of Yaku Cambio as communal and competitive encounter. *American Ethnologist, 24*(2), 289-310. https://www.jstor.org/stable/646571

– Silverstein, M., Putney, N. M., Gans, D., & Bengtson, V. L. (2008). *Handbook of theories of aging* (2nd ed.). Springer Publishing Company. https://books.google.es/books/about/Handbook_of_Theories_of_Aging_Second_Edi.html?id=lQv7-xPm_jsC&redir_esc=y

– Sultana, A., Wilson, J., Martin-Hill, D., Davis-Hill, L., & Homer, J. (2022). Assessing the impact of water insecurity on maternal mental health at Six Nations of the Grand River. *Frontiers in Water, 4*, Article 789123. https://doi.org/10.3389/frwa.2022.834080

– Swift, J. (1989). Why are rural people vulnerable to famine? *IDS Bulletin, 20*(2), 8-15.

– Transparency International. (2021). *Corruption perceptions index*. Transparency International. https://reliefweb.int/report/world/corruption-perceptions-index-2021-enarru?gad_source=1&gclid=CjwKCAjwuMC-2BhA7EiwAmJKRrOIE5hwVpSOjY8SnSHBhNr1WQ307RALtf0wmlualsn-dLPhQVPXxCxoC3MYQAvD_BwE

– United Nations Children's Fund (UNICEF). (2022). *Lebanon humanitarian situation report*. https://www.unicef.org/documents/lebanon-humanitarian-situation-report-mid-year-2022

– United Nations Children's Fund (UNICEF). (2022). *UNICEF report: Lebanon's water infrastructure struggles on, but remains on the brink.* https://www.unicef.org/lebanon/press-releases/unicef-report-lebanons-water-infrastructure-struggles-remains-brink

– United Nations Development Programme (UNDP). (2006). *Human development report 2006: Beyond scarcity: Power, poverty and the global water crisis*. https://reliefweb.int/report/world/human-development-report-2006-beyond-scarcity-power-poverty-and-global-water-crisis?gad_source=1&gclid=CjwKCAjwuMC-2BhA7EiwAmJKRrDyyYZedP5bLTB8qPkzdJAmSlVw9gAEjQv_KGH1EzLig3xV5DNmydBoCEBkQAvD_BwE

– United Nations Development Programme (UNDP). (2022). *Lebanon Crisis Response Plan 2021-2022*. https://www.undp.org/lebanon/publications/2022-lebanon-crisis-response-plan-lcrp

– United Nations High Commissioner for Refugees (UNHCR). (2022). *Syria Refugee Response Lebanon: Bekaa & Baalbek-El Hermel Governorate - Distribution of the Registered Syrian Refugees at the Cadastral Leve*l. https://reliefweb.int/map/lebanon/syria-refugee-response-lebanon-bekaa-baalbek-el-hermel-governorate-distribution-registered-syrian-refugees-cadastral-level-31-december-2022

– UN News. (2021). *Lebanon: Public water system on the verge of collapse, UNICEF warns.* https://news.un.org/en/story/2021/07/1096312