

WATER CRISIS AND WATER MANAGEMENT STRATEGIES IN THE SYRIAN REFUGEE SETTLEMENTS IN LEBANON

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Abstract

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Water scarcity is an urgent issue in the Middle East, and rapid population growth caused by the refugee crisis impose further demand on the water supply in the country. This research was carried out in order to portray the water crisis in Lebanon analyzing the water governance policies that have been implemented by the Lebanese government, especially after the Syrian refugee crisis. The aim of this case study is to describe the main reasons behind the water scarcity in Lebanon nowadays, besides analyzing the water governance strategies implemented by the Lebanese government and other international organizations to address this crisis within the context of the Syrian refugee crisis in Lebanon. Findings indicate that several actions must be done to minimize water stress in Lebanon if a political settlement in Syria is established and refugees begin to return to Syria. However, even if Syrian refugees return home and Lebanon's population declines, water scarcity will remain an issue that must be addressed. These long-term plans include agricultural water-use reform and, eventually, government water-sector reform.

INTRODUCTION

Based on the United Nations Department of Economic and Social Affairs (UNDESA), an area is experiencing water stress when annual water supplies drop below 1,700 m³ per person. When annual water supplies drop below 1,000 m³ per person, the population faces water scarcity (UNDESA 2015). After the Lebanese civil war, which is a multifaceted armed conflict that took place in Lebanon from 1975 till 1990, and due to the lack of adequate water policies by the Lebanese government, Lebanon had transformed from a water-secure country (2,500 m³/capita in the 1960s) to a water-deficit country (less than 1,000 m³/capita in 2010) just before the massive influx of Syrian refugees to Lebanon due to the Syrian conflict (FAOSTAT 2017). After the end of the civil war in 1990, the population in Lebanon has grown, reaching approximately 4 million Lebanese in 2002 based on the Central Administration of Statistics (2017). Since the beginning of the Syrian conflict in 2011, there has been an unexpected increase in the number of refugees in Lebanon, which was the 28 most water-stressed country in the world just before the Syrian conflict (Gassert et al. 2013).

Due to the Syrian civil war that has been raging since 11 March 2011, millions of Syrian civilians are seeking refuge in safer countries such as Lebanon, that is a small Mediterranean country (10 425 km²) with 82% of its borders shared with Syria to the north and east. Before the Syrian crisis,

the population in Lebanon was estimated at 4.6 million, most of which are considered to be urban (88%), the World Bank estimates the population as of 2016 to be 6.01 million (World Bank 2016). Worldwide, Lebanon hosts the largest number of refugees per capita with more than 1.5 million Syrian refugees. By the end of 2016, there were 29,000 tents inhabited by the Syrian refugees just in the Bekaa region in Lebanon, distributed over 2650 informal settlements. Informal settlements are shelters defined as tents or other handmade structures. The impact of refugee crises has been studied previously in different countries such as Tanzania (Paskett 1998), and Sudan (World Bank 2010), and the Iraqi refugee influx to Jordan in 2003 (Sassoon 2008). Many studies from different parts of the world have shown how refugee crises have imposed stresses on water resources in host countries (Black 1994; Hoerz 1995; Jacobsen 1997). A remote sensing-based study conducted on the Syrian portion of the Orontes basin showed a severe drop in irrigated agricultural production (Jaafar et al. 2015), indicating a lower usage of both surface and groundwater in the Syrian parts (war-affected country) of the basin in contrast to the Lebanese part (host country) where water use had been reported to increase (Jaafar et al. 2016; King and Jaafar 2015).

The presence of the Syrian refugees exposed the inadequacies of the Lebanese infrastructural capacity. While hostility is directed at

the Syrian refugees for using the Lebanese water and at the governments for mismanaging the water resources, generating the potential for domestic conflict and a crisis of state allegiance. At least 70% of the Lebanese population are facing critical water shortages, based on Al Jazeera and news agency reports in 2021. Lebanon's water supply system is on the verge of collapse and unless an urgent action is taken, more than 4 million people across Lebanon would face critical water shortages or would be completely cut off from the safe water supply within the year of 2021 (UN 2021).

Taken together, this indicates that the Syrian refugee settlements in Lebanon have poor access to clean water and sanitation. This crisis has suddenly triggered waves of refugees to neighboring countries, and many studies have been done focusing on the socio-economic impacts of the Syrian refugees on the host countries rather than focusing on the environmental and biophysical components of these impacts (El-Khatib et al. 2013; Achiume 2015; Wall et al. 2017). The aim of this case study is to portray the impact of the Syrian refugee crisis on the situation of the water scarcity in Lebanon, focusing on the government management strategies of the water sector and response to this crisis.

THEORETICAL BASIS

Water governance in Lebanon

Based on the website of The Ministry of Energy and Water (MOEW, 2015), MOEW and other departments of the Directorate of Hydraulic and Electrical Resources, and the Directorate of Exploitation are responsible for managing the water resources in Lebanon. Where the Directorate of Exploitation is taking over the responsibilities for the regional water establishments, that includes water supply, wastewater management and irrigation all over the Lebanese government. In addition to these, there is the Litani River Authority which manages the water supply at the largest river in the country with its extended authority. The municipalities in each region, which are parts of the Ministry of the Interior, are responsible for the local urban wastewater networks. There are also some units that are responsible for the water governance, being housed by the Lebanese governmental institutions. For example, there is a unity responsible for the water tariffing system housed by the Ministry of Agriculture. Another unit responsible for the water quality standards in the potable water on the market. As for the water management infrastructures' restoration, there are two main councils that might be involved: the Council for Development and Reconstruction, and the Council of the South and the Central Fund for the Displaced. Table 1 below reflects some international literatures

on water resources and energy demand, and their relation to the economy of the country.

The Ministry of Energy and Water undertakes the affairs of water, electricity, oil, minerals, mines and quarries, according to the following powers and tasks for the water sector:

- Monitoring and control of an agent, statistics and studies of water resources and estimation of water needs and areas of use in all regions.
- Monitoring the quality of surface and ground water and determining its standards.
- Develop a general design project for allocating and distributing water resources for drinking and irrigation across the country, and draft a general master plan for water and sanitation, constantly updating it and submitting it by the minister to the Council of Ministers.
- Designing, studying and implementing major water facilities such as dams, mountain lakes, tunnels, straightening river courses, water networks, and others, and putting them into investment.
- Conducting artificial feeding of groundwater reservoirs, when necessary, and monitoring the investment of the quantities extracted from them.
- Work to protect water resources from waste and pollution by setting up texts and taking the necessary measures and procedures to prevent pollution and return them to their natural quality.
- Granting licenses and licenses to explore for water and use public water and river public properties, and conduct all related transactions and grant them in accordance with the laws and regulations in force.
- Conducting water, geological and hydrological studies and research, collecting technical data in the water field, drawing up technical maps for them and updating them regularly.
- Exercising supervision and guardianship over public institutions and all other bodies operating in the water field in accordance with the provisions of this law and the texts and provisions relating to each of them.
- Enhancing the performance of public water investment institutions, and monitoring this performance on the basis of the indicators mentioned in the duly certified business program.
- Setting standards to be adopted in the studies of public investment institutions and the

implementation of their works, as well as investment conditions and regulations for surface and ground water, sewage water, and standard systems for water quality and control.

- Completing the acquisition transactions belonging to the Ministry and the public water investment institutions under its tutelage in accordance with the laws and regulations in force.
- Express an opinion on licenses for mines and quarries in terms of their impact on water resources.
- Securing public relations with citizens and informing them of everything that concerns them in water affairs and rationalizing its use.

RESEARCH METHODOLOGY

Case Study

Although there are many research studies that address the situation of the water stress in Lebanon as a host country in the light of the Syrian refugees influx, most of these studies are outdated and no recent academic research has been done on portraying the situation of the water stress in the Syrian refugee settlements focusing on the water management strategies by the Lebanese government in these settlements. Therefore, qualitative research is deemed appropriate in this context, where Morse (1991) stated that a qualitative research problem is used when a need exists to explore and describe the phenomena.

This research is a case study and it is descriptive and exploratory in nature. Case studies are a design of inquiry found in many fields in which the researcher develops an in-depth analysis of a case, that is bounded by time and activity where researchers collect detailed information using various data collection procedures (Creswell, p.51, 2018). The research is based on an inductive approach since the aim is to explore the general image of the water stress situation in Syrian refugee settlements in Lebanon out of the gathered primary and secondary data, explained below.

The issue that this case study addresses is the water stress and its management in the Syrian refugee settlements in Lebanon. To gather data for analysis, semi-structured interviews were conducted with the key informants who are involved in the water sector, whether in governmental or non-governmental organizations. Those who have in-depth knowledge about the history and the current situation and problems with their vision on the future plans for the water sector in the country. These semi-structured interviews are not designed to generate representative units in a statistical sense, rather it is to enhance the understanding and to portray the full image of the water stress in the

country. The research utilized the data that was gathered at one part of the time and was concerned with the water stress in Lebanon, especially under the light of the Syrian refugee crisis. The researcher hopes through these interviews to be able to portray the situation of the water stress and the water management strategies as discussed in the object of study. The researcher sets open question prompts for discussion, the semi-structured interviews provide the opportunity to explore particular responses in further detail.

Regarding the documents used for the research, the researcher will carry an analysis of the 10-years water master plan in the Bekaa region in Lebanon conducted by the United States Agency for International Development (USAID). In order to determine if the governance plans carried out by the Lebanese government in collaboration with international institutions are in accordance with the water master plan. The aforementioned data will be coded and categories were created to obtain a uniform result that allows the subsequent triangulation and corresponding analysis that answers the questions of the present investigation.

RESULTS AND DISCUSSION

Implementing the Water Master Plan

Lebanon is facing rapid changes that lead to huge water stress. The main changes that lead to water scarcity include: population growth, excessive demand for water for irrigation, climate change that exacerbates drought and increases risks, and water resources mis-management by the Lebanese government.

The issue of water has been continuous with the relevant Parliamentary Committee and the Energy and Water Committee for more than twenty years, and most of the recommendations at that time still exist since 2003, 2005, 2007 and 2009 as if the wheel of time in Lebanon had stopped. The mis-management of the water sector by the Lebanese government and other organizations is one of the main reasons behind the water scarcity in the country, which include:

1. Lack of strictness in protecting water sources from pollution and respecting the areas of springs, and easiness in licensing health facilities in terms of location and specifications.
2. Lack of the implementation of waste water treatment plants, and not encouraging the establishment of small refinery stations by municipalities and others.
3. Poorly securing needs necessary for water establishments to secure the required treatment for the safety of drinking water.
4. Incomplete of the implementation of water networks and their connections.

5. Absence of the vision and mission in the country such as working to secure a regional health laboratory affiliated to the Ministry of Health in each governorate and benefit from the contributions of the World Health Organization to equip these laboratories.

Although Lebanon has a rich natural water wealth, our country faces a water shortage of about 283 million cubic meters annually in 2017, and it is expected to rise to 410 million cubic meters by 2025 if no major measures are taken, according to Nabih Berri, parliament speaker representing the Committee's Chairman. This is the water crisis that Lebanon is experiencing, and it will worsen in the coming years as a result of population growth, uncontrolled urbanization, unsustainable use of water, climate change, and the influx of Syrian refugees. In addition to other factors such as poor wastewater management, and water treatment problems. All of these reasons lead to a decrease in the amount of drinking water.

The World Bank has invested 600 million dollars in the water sector in Lebanon through the establishment of 134 km of water distribution networks, sewage collection and rehabilitation of waterways networks in the Bekaa region in Lebanon, where the influx of Syrian refugees has affected the host communities. Implementation of World Bank investments through the Greater Beirut Water Supply Project (a loan of 200 million dollars) and the project to increase the water supply in Lebanon (474 million dollars), in cooperation with the Islamic Development Bank (128 million dollars) and the Lebanese government (15 million dollars). Furthermore, the European Investment Bank contributed to the wastewater project in Greater Beirut with a subsidized loan of 60 million euros, and the water and wastewater project in Kesrouan with a loan of 150 million euros. The issue of water acquires special importance in Lebanon and the countries of the region, given the limited availability of it for drinking and irrigation, and according to the index that leads to any country in which the average per capita share of water annually is less than 1,000 cubic meters is considered a country suffering from water scarcity. Well, about 13 Arab countries fall into the category of countries with water scarcity, and this scarcity is exacerbated by high population growth rates.

The World Bank reports show that the average annual per capita share of renewable water resources in the Arab world will reach 667 cubic meters annually in 2025, down from 3,430 cubic meters in 1950, a decrease of 80%. So, the issue of water has become a candidate to ignite wars in the Middle East and Africa, especially since most Arab countries do not have complete control over their water sources. Ethiopia, Turkey, Guinea, Senegal,

Kenya and Uganda are countries that control about 60% of the water resources of the Arab region, while the enemy remains the Israeli has usurped most of the Arab ring countries' share of the water and always aspires to control more water resources. These results positively correlate with the findings of Jaafar (2020), where Lebanon was considered the 28th most water-stressed nation in the world prior to the Syrian conflict. Water deficit has indeed been worse, but it has yet to be detected at the national and, more crucially, sub-national scales. There have been indications of falling spring flows and underground water in various aquifers in Lebanon, which have also been attributed to the refugee crisis, according to the UNDP.

The problems of the water sector in Lebanon can be summarized as follows:

1. Limited resources and low efficiency in the means of investment, which are matched by increasing demand.
2. Insufficient transmission and distribution networks and in a state of affairs. Wasteful leads to a high percentage of waste and interruption in nutrition.
3. Poor coverage of sewage networks with limited effectiveness of treatment.
4. Slowness and stumbling in the implementation of the water sector reform law and weak coordination between the concerned departments.
5. Useless tariffs for drinking water and irrigation with rates Weak achievement.
6. Limited activities in the field of rationalizing methods of use.

As with regard to the administrative aspect, the summary of the initiatives can be identified as follows: completing the process of reviewing the structure of water institutions and getting rid of the current restrictions, improving the situation model between water institutions and the Ministry of Energy and Water and improving the performance and effectiveness of these institutions, restructuring the ministry in accordance with the requirements of Laws 221 and 247, improving the levels of manpower and capabilities required to operate and maintain facilities, setting a new tariff based on the quantities of water actually consumed, urging the private sector to participate in the water sector, and rationalizing the domestic, industrial and agricultural use of water.

Lebanese communities hosting Syrian refugees face water and sewage pollution, waste management, and other challenges. Health problems resulting from water pollution are a growing concern, officials said, as municipalities hosting refugees need sewage networks and water treatment plants capable of responding to the urgently increased demand. Because of the critical nature of these problems, international organizations working

with refugees have increased their preventive health measures for Syrian refugees in all official and informal camps. However, the underlying problem is the intrusion of sewage into irrigation water and groundwater, which must be addressed, based on the interview with one of the Syrian refugees in Lebanon. This is in accordance with the research study held by Dagher (2021), where poor infrastructure, inadequate sewage and waste disposal systems, and inadequate water quality surveillance programs all contribute to water pollution and its related issues, which include the growth of antibiotic-resistant bacteria. Antibiotic overuse and misuse in both individuals and agriculture have been linked to an increase in antibiotic resistance in Lebanon, according to several publications. Multidrug and highly drug-resistant microorganisms have been found in hospital settings, agricultural animals, and the environment, suggesting that this issue may be ubiquitous. Consequently, Lebanon's water contamination poses a serious threat to both the economy and public health.

CONCLUSION

Water scarcity is an urgent issue in the Middle East, and rapid population growth caused by the refugee crisis impose further demand on the water supply in the country. This research was carried out in order to portray the water crisis in Lebanon analyzing the water governance policies that have been implemented by the Lebanese government, especially after the Syrian refugee crisis. The results show that the main causes behind the water crisis in Lebanon are the: sudden population growth, excessive demand for water for irrigation, climate change, and water resources mis-management by the Lebanese government.

These findings suggest that the influence of refugees and their indirect conflicts on water stress is critical and must not be overlooked; chances exist for the international community to intervene and enhance water supply and network efficiency, which may alleviate the caused stress. The rapid growth in urban water stress needs greater political attention and resources. The refugee situation is a politically delicate issue, and no solution has been established. If the current issue is not addressed, future urban water-use concerns will worsen. Aside from metropolitan regions, rural areas will require special attention in water network building and restoration activities to fulfill rising demand. Rural lives in Lebanon rely heavily on sustaining agricultural output in regions where refugees are concentrated.

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