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WATER (IN)SECURITY IN THE BEKAA: INTRODUCING AN INTEGRATIVE LENS TO THE LEBANESE WATER SECTOR

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Summary

This Policy Brief is based on the ongoing research on 'Water Security for Regional Water Establishments (RWEs) and the Litani River Authority (LRA)', as part of the USAID funded Lebanon Water Project. The study aims to assist stakeholders governing the water sector in improving decision-making, service provision and overall water resource management. Water security means that "every person has access to enough safe water, at an affordable cost, to lead a clean, healthy and productive life, while ensuring that the natural environment is protected and enhanced".
Water security is also about mitigating water-related risks, such as floods and droughts, addressing conflicts that arise from disputes over shared water resources, and resolving tensions among stakeholders competing for a limited resource (Van Beek and Arriens, 2014).

KEY RECOMMENDATIONS

A HOLISTIC STRATEGY SHOULD BE PURSUED WHICH FOCUSES ON AREAS OF CONCERN IN THE WATER SECTOR, MOST IMPORTANTLY WATER GOVERNANCE AND WASH ALONG WITH ENVIRONMENTAL ISSUES, WATER-RELATED HAZARDS AND RISKS, AND WATER INFRASTRUCTURE.

- Modify and implement policy measures – such as Law 221/2000 – to enable stakeholders, primarily RWEs and LRA, to engage in policy making, law enforcement, and improved water governance.
- Invest in improved infrastructure and ensure its sustainable operation and management. This includes water and sewage networks and most importantly wastewater treatment plants.
- Install metering systems to manage and decrease losses, withdrawals and consumption at the household and establishment level.
- Design and implement drought and flood management plans, to ensure the protection of communities and economic sectors from these water-related disasters.

Background and Problem Statement

Water insecure societies face numerous and severe challenges such as water and food shortages; increasing water-related disasters; pervasive pollution of water bodies; and water conflicts; all of which will be magnified with climate change (OECD, 2013). More importantly, water insecurity impacts the poorest and most marginalized communities (Zeitoun et al., 2016). With access to only 1.4% of the world's freshwater, the Middle East and North Africa region is a prime example of an area with a high water security threat, and Lebanon is no different (Siddiqi and Anadon, 2011). In order to address such issues, effective water-related policies and strategies should be framed in the context of water security.
In Lebanon, solutions to many of the numerous and increasing water challenges have lacked sustainability and failed to simultaneously address the multiple stressors which impact the water sector. Thus there is a considerable need to create solutions which are aligned with a well-informed policy, engage stakeholders, and are holistic and sustainable.

Currently the Lebanese Water Sector is governed primarily by Law 221/2000 which restructured the management of the sector under the umbrella of the four autonomous RWEs (Bekaa, North, South and Beirut and Mount Lebanon), and the oversight of the Ministry of Energy and Water (MoEW) (MoEW, 2010). Law 221 however, does not clearly delineate the roles and responsibilities of the various stakeholders.

More importantly it precludes RWEs from engaging in policy-making (Farajalla et al., 2015), which significantly hinders their ability to manage the water sector. In this context, the study on which this policy brief is based offers a new approach to assess water challenges in the Bekaa, one which is specifically tailored towards informing strategic decisions and facilitating the integration of science in policy-making.

Conceptual Framework

A water security index was developed based on indicators populated with data pertaining to the Bekaa. Indicators were then translated into numerical terms, evaluated according to international benchmarks, and scored from 1 to 5, where 1 is very poor and 5 is optimal. These indicators were aggregated into specific dimensions of water security, which reflect the following contextualized aspects of the water sector: (i) household, (ii) environment, (iii) economic, (iv) hazard and risk assessment, (v) water infrastructure, and (vi) water governance dimensions. Based on these scores, stakeholders in the region are enabled to identify areas of concerns, prioritize actions and investments, monitor their progress, and frame their strategic decisions.

Main Findings

The scores achieved for the six dimensions reflect the main problems facing the water sector in the Bekaa. Overall the water sector in the Bekaa is in a poor condition with governance clearly the most problematic dimension (score of 1.25) and the household water security (score of 1.5) very closely behind. The economic dimension received a good score (4.1), revealing a generally productive use of water across economic sectors in the region. Figure 1 illustrates all dimensions of water security and their performance in the Bekaa, scored on a scale from 1 to 5.

- The most pressing issue in the region pertains to water governance, the dimension which scored the lowest. The two main authorities (BWE and LRA) tasked with managing the water sector are understaffed, and suffer from severe financial deficiencies, which hinder their efficient performance. Consequently, they are unable to properly collect water bills, and monitor the proliferation of illegal wells; leading to water insecurity.

- Household water security also received a low score, meaning that Water, Sanitation, and Hygiene (WASH) at the household level in the Bekaa is very poor. Waterborne diseases are prevalent in the area, and many households are not connected to water and wastewater networks, compromising the health of people and the environment, as well as the population's livelihood and general wellbeing.

- The environment, hazard and risk assessment, and water infrastructure dimensions scored poorly as well. Results reveal severely stressed groundwater resources, due to unsustainable practices and a lack of resource regulation. Untreated wastewater in the Bekaa is also a prime issue, apparent through the lack of functioning wastewater treatment plants, and the poorly connected sewage network. Similarly, the water network in the region is in a poor condition resulting in excessive leakages. Finally, there is a generally high risk to the impacts of floods and droughts, which is critical given the high dependence of the region on agriculture.

"86% of water in the Bekaa is used for agricultural purposes"

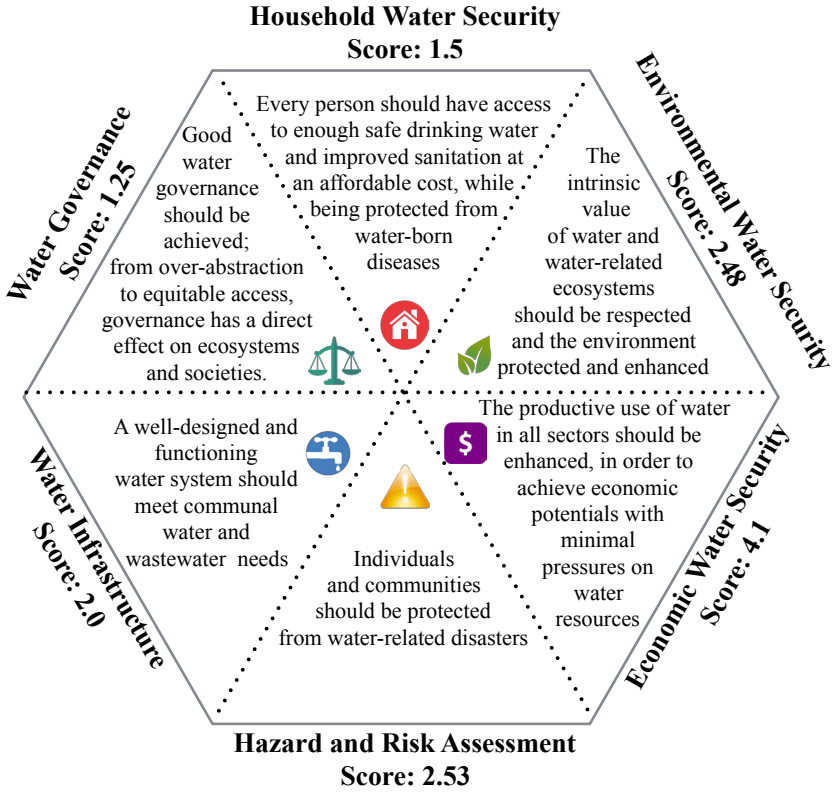

Figure 1. Water security dimensions and scores

Further Recommendations

Further key recommendations were devised throughout the study and should be considered to achieve improved water security in the region.

1. First, a holistic database shared between different institutions and research centers is essential, to facilitate integrated policy making. This database should comprise accurate and timely data, to ensure the validity and reliability of results.

2. Although developing policies is highly needed in Lebanon, there should be an equally important focus on policy implementation. For instance, illegal well-drilling, groundwater exploitation, and illegal discharge of pollutants are prevalent practices not only due to the lack of effective policies, but also due to the incapacity of authorities and the community to implement these policies, and the lack of cooperation between stakeholders.

3. Water security is complex as it relates to many sectors including but not limited to water, food, energy, climate, and biodiversity (Bakker, 2012). It should therefore be addressed based on an integrated water-energy-food security management strategy. In fact, food and energy security are impacted by agricultural practices, carbon strategies, renewable energy and vice versa (Grey et al., 2013). For instance, fossil fuel based energy generation needs water for cooling, and biofuels require a lot of water to grow, therefore reducing the amount available for food production (Mehta and Nagabhatla, 2017).

4. Climate change impacts include altered rainfall and temperature patterns, and an increased rate of water-related risk, leading to water insecurity. The uncertainty of climate projections for Lebanon makes it difficult to provide specific recommendations for climate resilience. However, innovative aspects of this water security assessment include a focus on vulnerability, risk, resilience, and adaptive management given limited predictability. The Bekaa is considered to be one of the most vulnerable areas to climate change in Lebanon (MoE et al., 2016). Therefore, a focus on climate resilience and adaptive management is essential to enable the region to face the threats emanating from climate change (AMCOW, 2012). As such elements of a climate resilient strategy, centered on natural-based solutions for the Bekaa is illustrated in Figure 2.

"Only 11% of wastewater generated in the Bekaa is treated"

"All evaluated wells in the Bekaa manifest dropping water levels ranging from 2 to 41 meters"

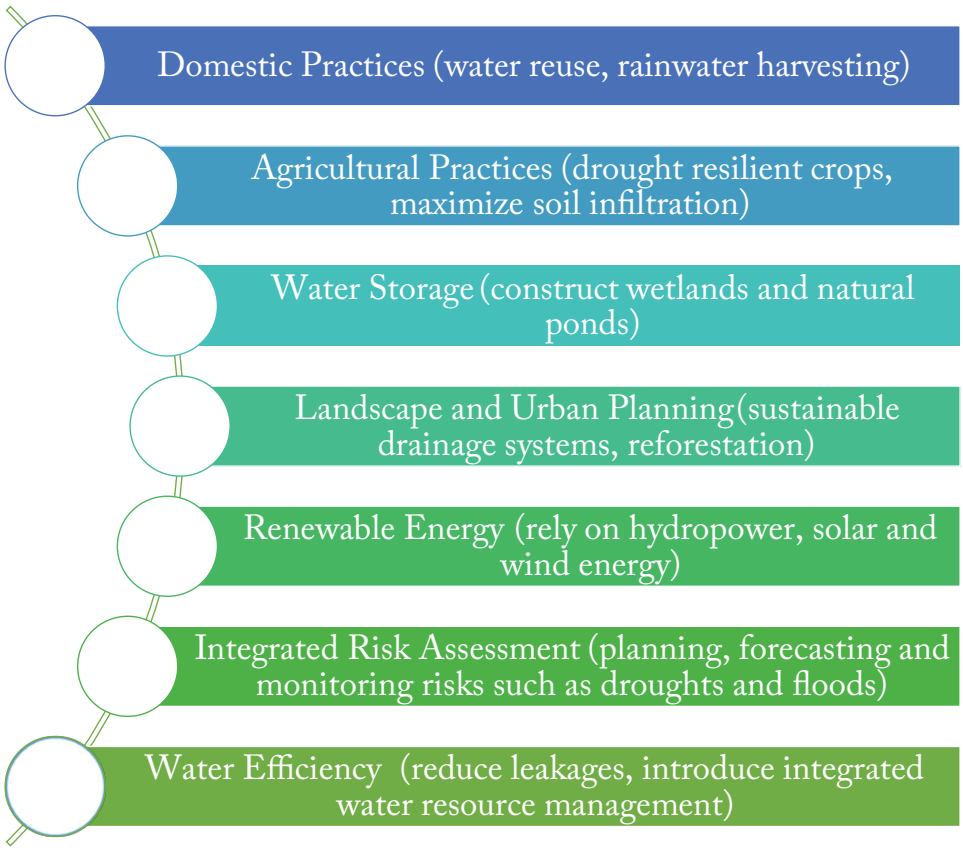

Figure 2. Climate resilient strategy for the Bekaa

List of Acronyms

BWE	Bekaa Water Establishment
LRA	Litani River Authority
MENA	Middle East and North Africa
MoEW	Ministry of Energy and Water
RWEs	Regional Water Establishments
USAID	United States Agency for International Development
WASH	Water Sanitation and Hygiene

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Climate Change and Environment Program

The Climate Change and Environment program, at the Issam Fares Institute for Public Policy and International Affairs at AUB, was originally launched in 2008 as "The Research and Policy Forum on Climate Change and Environment in the Arab World". The program aims to use academics' technical expertise to answer socially driven questions on climate change and environment in order to fill policy gaps in Lebanon and the Arab World. Topics are tackled in a multidisciplinary approach using both Social and Applied Sciences perspectives to answer the same hypotheses.

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