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# المنتدى اللبناني للمياه

## Lebanon Water Forum

**Rethinking water service provision in Lebanon**

May 26 - Issam Fares Institute auditorium

### Lebanon Water Forum Report

#### ACKNOWLEDGMENTS

Dr. Ralf Klingbeil

Participants and Speakers

Ministry of Energy and Water Resources

Issam Fares Institute - AUB

Oxfam



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# LIST OF ACRONYMS AND ABBREVIATIONS

<b>BWE</b>	Bekaa Water Establishment
<b>CDR</b>	Council for Development and Reconstruction
<b>CTB</b>	Central Tender Board
<b>IBR</b>	Increasing Block-Rate
<b>IFI</b>	Issam Fares Institute for Public Policy and International Affairs
<b>LRA</b>	Litani River Authority
<b>MOA</b>	Ministry of Agriculture
<b>MOE</b>	Ministry of Environment
<b>MOEW</b>	Ministry of Energy and Water Resources
<b>MOF</b>	Ministry of Finance
<b>MOI</b>	Ministry of Industry
<b>MOIM</b>	Ministry of Interior and Municipalities
<b>MOPH</b>	Ministry of Public Health
<b>RWES</b>	Regional Water Establishments
<b>NRW</b>	Non-Revenue Water
<b>NWE</b>	North Water Establishment
<b>NWSS</b>	National Water Sector Strategy
<b>O&amp;M</b>	Operation and Maintenance
<b>USAID</b>	United States Agency for International Development
<b>WES</b>	Water Establishments

## 1. INTRODUCTION

Under the patronage of the Ministry of Energy and Water Resources (MoEW) and funded by the European Union, the first meeting of the Lebanon Water Forum was held on May 26th 2016, at Issam Fares Institute for Public Policy and International Affairs (IFI), organized by Oxfam Lebanon in collaboration with IFI. It called for 'Rethinking Water Service Provision in Lebanon', bringing together government authorities and their institutions, services providers, academics, experts and practitioners in the field, to reflect on water service provision in Lebanon.

The water sector in Lebanon is currently impeded by both external and internal obstacles, hindering the provision of high quality services to customers. Besides the increasing threat of climate change on water availability, the sector is facing considerable financial, technical and administrative constraints. Consequently, public water services have been operating with annual deficits and low recovery costs. In parallel, water consumers' trust in public services has substantially decreased over the years, as intermittent and limited hours of water supply forced customers to rely on the informal parallel water market (private sector).

In this context, the forum called on the knowledge and expertise of different stakeholders in the field (governmental agents, civil society groups, researchers and others) in order to address the scope and diversity of challenges regarding water service provision in Lebanon. The forum aimed to give space for a dialogue amongst stakeholders, to find a way forward amidst growing water-related constraints. By tackling the major policy gaps and institutional voids, it aimed to provide contextualized recommendations pertaining to improved public services and increased cost recovery for Regional Water Establishments (RWEs).

The forum's agenda was divided into three thematic sessions which tackled the different challenges raised by governmental and non-governmental agents, bringing forward cross-cutting observations and recommendations regarding service provision. The first session engaged the general directors of two Regional Water Establishments (RWEs) in Lebanon, in a series of open-ended questions regarding the challenges they are facing, their strategic planning, and their cost recovery and customer relations experiences. The second and third sessions pertained to discussions focusing on the legal foundations of water service provision, the implementation of tariffs in the water sector in order to enhance WEs' cost recovery, the socio-economic implication of the current water services on water customers and exploring the current accountability mechanisms for contracting infrastructural project and water governance and integrity in Lebanon. The forum wrapped up with a round table discussion, engaging stakeholder dialogue about the main issues and recommendations highlighted throughout the previous sessions.

## 2. BACKGROUND

### Law 221 and NWSS

Various water laws and regulations in Lebanon, date back to the periods of the Ottoman Empire and the French Mandate. Some laws and decrees are still in application within the Lebanese water sector, such as Decree 144 and 320, issued respectively in 1925 and 1926. The former decree defines water as a public good, and the latter decree highlights the necessity of its management. Currently, the water sector in Lebanon is mainly regulated through the overarching Law 221 of 2000 and its amendments (in addition to Laws 228/2000 and 337/2001. Law 228/2000 enacts a national privatization law, encouraging the participation of the private sector. Law 337/2001 formally replaced the name of the Ministry of Hydraulic and Electric Resources with the Ministry of Energy and Water Resources.

Law 221 was issued on May 29th 2000, and completely restructured the water sector in the country. Prior to this law, water was governed under the responsibility of 21 Water Authorities and over 200 Water Committees which had largely overlapping duties and unregulated structures. Since its implementation, Law 221 has consolidated pre-existing water authorities under the regulation of four RWEs (Beirut-Mount Lebanon, Bekaa, North and South Lebanon) and the Litani River Authority (LRA), responsible for the management of all rivers in Lebanon. Law 221 exclusively administered the MoEW primary authority over the water sector and the RWEs. However, secondary stakeholders also play a critical role in the governance and management of water resources. These institutions include the Ministry of Agriculture (MoA), Ministry of Environment (MoE), Ministry of Public Health (MoPH), Ministry of Interior and Municipalities (MoIM), the Council for Development and Reconstruction (CDR), Ministry of Industry (MoI) and to some extent the Ministry of Finance (MoF). The table below describes the duties and responsibilities of key stakeholders in the water sector.

Table 1. Roles and responsibilities of governmental stakeholders in water sector (Farajalla et al., 2015)

	Description of responsibilities	MoEW	WEs	MoA	MoE	MoPH	MoIM	LRA	CDR	MoI
Policy-making	<ul style="list-style-type: none"> <li>Definition of sector policy, institutional roles and structures</li> <li>Enactment of legislation and regulation</li> <li>Development of investment and subsidy policy</li> </ul>									
Planning and Implementation	<ul style="list-style-type: none"> <li>Establishment of long-term consolidated planning for water, irrigation and waste water</li> <li>Evaluation of infrastructure and investment requirement</li> <li>Water rationalization</li> <li>Design, construction and operation of major water infrastructures</li> <li>Funding and execution of investment programs</li> </ul>									
Conservation and Resource Management	<ul style="list-style-type: none"> <li>Allocation of resources across regions, e.g., water reuse</li> <li>Identification and promotion of water conservation campaigns</li> </ul>									
Regulation and Enforcement	<ul style="list-style-type: none"> <li>Issuance of regulations</li> <li>Enforcement of regulations and standards for cost recovery, service quality, water quality, and consumer relation</li> </ul>									
Operation and Distribution	<ul style="list-style-type: none"> <li>Billing and collection of tariffs</li> <li>Maintenance and renewal of infrastructure</li> </ul>									
Waste Water Treatment	<ul style="list-style-type: none"> <li>Operate, maintain and renew sanitation infrastructure</li> </ul>									
Control and Monitoring	<ul style="list-style-type: none"> <li>Management of all information including data collection, analysis and reporting</li> <li>Implementation of service quality and contingency planning</li> </ul>									

As per Law 221, the MoEW was granted an overarching role in the water sector, as primary policy maker, regulator and resource manager, including strategic and master planning. In parallel reforms under Law 221 placed WEs at the center of water services provision, as they became responsible for carrying out studies, O&M, implementation and renewal of projects for drinking and irrigation water, and wastewater. Other duties such as infrastructure maintenance, setting tariffs, collecting bills and ensuring water quality also fall under the responsibility of WEs. In addition, within the perimeters fixed by the present Law 221, WEs are expected to operate with financial and administrative autonomy. However, WEs have not reached such autonomy, as they have been stacking up annual debts and falling short on staffing capacity. In light of such discrepancies, the MoEW has taken several steps to amend the gaps engendered by the implementation of Law 221, notably through the development of the NWSS in 2010. This strategy aimed to fully complete reforms set by Law 221, provide financial initiatives for WEs and initiate policy frameworks to overcome the legal, institutional and organizational gaps and sets investment requirement to achieve water provision targets in the water sector. However, the NWSS has currently fallen short in accomplishing these goals, which were set to be achieved by 2015.

### Water Code

The draft Water Code or 'Code de l'Eau' is another prospective form of regulation in the water sector. This code was drafted in 2005, with the assistance of the French government and primarily promotes Integrated Water Resource Management (IWRM). This Code was partly developed to fill the institutional gaps of Law 221 (USAID, 2013). Other aims of the Water Code include the promotion of the 'user pays' and 'polluter pays' principles and a decentralized approach to water planning and management, through the definition of River Basin Plans. One of the goals of the NWSS was to enact this code; however its drafting has not been completed and is still pending.

The key components of the draft Water Code include the following:

- Appointing Public Authorities as the main entity responsible for overseeing and regulating freshwater quality, providing safe drinking water and wastewater treatment, drought and flood management and the protection of all water resources;
- Developing a National Water Council acting as policy and planning institution for the water sector (including ministry and municipality members and other relevant professionals);
- Developing a National Water Plan and River Basin Plans, in order to identify the qualitative and quantitative needs of the sector and accordingly allocate resources and define areas in need of protection;
- Encouraging private sector participation.

The next section of this report will entail in the description of the main areas of concern, pertaining to Law 221 and cost recovery in the water sector, according to the experience of the general directors of WEs.



### 3. AREAS OF CONCERN: EXPERIENCE OF WATER ESTABLISHMENTS

The first session of the forum engaged the general directors of two WEs (North Lebanon and Bekaa) in a series of open-ended questions that allowed them to identify the major obstacles hindering their work as water establishments, and pertaining to cost recovery as well as future aspirations and plans. Following are the open-ended questions that were asked to the general directors:

1. Considering the 16 years since the enactment of Law 221 of 2000 and the establishment of the four regional WEs. What do you retroactively see as the obstacle(s) for the implementation of Law 221 that were not foreseen when the Law was initially developed and agreed to in year 2000? Where are today's options to improve or correct this?
2. Do your WEs have a water strategy or master plan for your region? Does it include demand management? Is the NWSS in line with your WEs goals?
3. Cost recovery for water utilities is often considered a major cornerstone for efficient and sustainable water supply. With the current tariff system in place, are your costs covered? What financial capabilities do you need to improve your services? How can a different tariff system contribute to an improved overall cost recovery?
4. What are your views about your subscribers and their ability and willingness to pay for water and respective services?
5. Does your Water Establishment have plans to reduce water losses in distribution systems and encourage water conservation? How on the long run, can the tariff system financially contribute to these?

Three main areas of obstacles were identified as a result of the discussion with the Director Generals of WEs:

#### **Weak legislative infrastructure and lack of monitoring mechanisms**

There are large discrepancies pertaining to the implementation of Law 221, which have impeded the functioning of WEs. The most prominent obstacle has been the distinct overlap of duties and responsibilities amongst and within institutions in the water sector. Indeed, responsibilities such as service provision, project planning and implementation and capital expenditures are scattered amongst various entities, without the proper coordination amongst authorities, hindering efficient performance. Some reforms have been initiated to overcome this overlap of duties; however they have not been completed, urging the need to provide a distinct description of the roles of all stakeholders in the water sector. On another note, there is a lack of a regulatory entity responsible for the enforcement and follow-up of violations. Indeed, WEs have no proper enforcement mechanisms to deal with the corruption and lack of compliance across their regions. All these discrepancies clearly warrant legislative restructuring, to ensure the WEs' efficient performance and autonomous functioning.

#### **Lack of financial and administrative autonomy**

Inconsistencies between legal and de facto responsibilities of all water authorities have been singled out as major obstacles in the water sector. Indeed, operating as autonomous entities on the financial and managerial level is one of the legal responsibilities set by Law 221. However, WEs are currently

suffering from a significant shortage in staff, specifically in managerial positions such as the heads of the wastewater and irrigation units. Instead, WEs largely rely on contractor-based staff, which consist of workers performing O&M duties (MoEW, 2010). This is due to budget shortages, which forced WEs to hire 50% of their staff as contractors. On the other hand, a majority of the WEs' permanent staff are nearing retirement age, and lack strong technical expertise. Thus WEs do not have the proper resource to manage their establishments independently. In addition, the BWE and NWE have been operating with yearly financial deficits, often failing to fully cover O&M costs. Although external institutions have had some financial contributions to the WEs, their annual budget is strictly reviewed by relevant ministries for approval, and usually result in the provision of low financial resources. In addition, unpaid customer bills and illegal access to water services have further aggravated these financial deficits. This lack of financial sustainability has rendered WEs unable to perform some of their responsibilities, such as rehabilitating and restoring water networks in designated areas. Currently distribution networks in Lebanon are facing severe losses (between 20-40% according to the latest reports), which also reflects financial losses for the establishments as it increases the level of their non-revenue water. Although NWSS goals have aspired to financially promote WEs, these goals have yet to be put into action.

### **Illegal connections and lack of compliance**

In the areas of Bekaa and North Lebanon, the rate of unpaid bills has been reported to be very high (reaching almost 40% in some cases). In addition, only 60% of the inhabitants in those areas are actually connected to the water network, most of them relying on external means for acquiring water services. Some of these external means include illegal connections and permitting, and over-abstraction. Although the MoEW is in charge of issuing well permits, it does not hold the authority to shut down an unlicensed well as it is the duty of the MoIM. In addition, WEs do not have the authority to ensure customer compliance, and do not operate a process which documents financial remittance of bills. These discrepancies hinder WEs to monitor illegal connections and properly collect customer bills.

These three areas of concern have been singled out by WEs, as major obstacles in the water sector. The second session of the forum focuses on one particular challenge faced by WEs, which is the lack of cost recovery within the sector, the socio-economic impacts of water service provision, the tendering process in the sector, and water integrity and governance.



## 4. COST RECOVERY IN THE WATER SECTOR

The second and third sessions of the forum focused on the cost recovery process within water establishments in Lebanon. Specific attention was drawn to the current tariff system and its repercussions on the WEs' financial recovery. Experts in the field were called to discuss their relevant experiences and executed pilot projects, on cost recovery in the water sector. During these sessions, the different challenges pertaining to cost recovery and tariff systems were brought forward by three keynote speakers: Dr. Roger Milki, Mr. Salah Saliba and Mr. Michele Pierpaoli, whose discussions are summarized below:

### Current Challenges to Cost Recovery

#### Current Tariff System

As required by law, the implementation of a tariff system usually falls under the responsibility of WEs. The current system in Lebanon relies on annual flat tariff subscriptions and is in no way related to the actual per capita consumption. The main parts of the water bill are composed of fixed charges, pertaining to the volume of water supplied to consumers, which is fixed at 1m<sup>3</sup>/household/day and the other part is contingent upon connection charges. The tariff structures in the regions of BWE and NEW are respectively the following: \$118/ year and \$140/ year (MoEW, 2010). Although this lump sum tariff is relatively affordable, it is highly inefficient as it impedes consumers' incentives for water conservation and WEs' commercial incentive for efficient production and cost recovery. Indeed should there be a leakage in customers' households, they would not have any financial motive to fix it, hindering efficient consumption. As previously mentioned, WEs are already facing significant financial deficits, not allowing them to meet their O&M costs, and with their high amount of non-revenue water (NRW) they are far from achieving cost recovery. Over-abstraction, illegal connections and irregular updates of customer registration further contribute to low cost recovery.

Another obstacle mentioned in the forum has been the incongruence between the actual consumption and design. Indeed, the water supplied to each household is set at 1 m<sup>3</sup>/day which corresponds to approximately 220 L/capita/day<sup>1</sup> whereas design criteria as per NWSS are 165-180 L/capita/day (MoEW, 2010). A pilot study revealed that the average water consumption in rural settings was calculated at 127 L/capita/day (Pierpaoli, 2016). Thus it is necessary to set the adequate per capita consumption in Lebanon, which might appear to be way less than the provided 1 m<sup>3</sup>/day.

Besides the poor customer compliance with billing, unsystematic and low collection rates of bills have further aggravated the cost recovery of WEs. Bill collection occurs only on a yearly basis, with a lack of monitoring of customer compliance.

#### Absence of Water Metering Systems

A necessary component of a volumetric tariff system is the installation of water meters. Currently there is no actual relational link between cost, consumption and prices since neither the water utilities nor the consumers have the ability to measure volumes of water effectively used or paid for. Indeed, only 10% of the connections in Lebanon are currently metered, none of which are operating on a volumetric tariff, and rather rely on the normal lump sum tariff. Moreover, bulk water meters are also lacking at the production level, as most connections are not being metered, impeding WEs to evaluate their production rate and network losses.

<sup>1</sup> Per capita consumption is calculated based on average number of individuals in a given household (HH). In this case the average used was the following  $4.5 \text{ ind}/\text{HH} = 220 \text{ L/capita/day}$  (MoEW, 2010).

## Absence of Data

Currently, WEs are using inconsistent and imprecise data regarding the volumes produced, distributed, sold and their associated costs. Inconsistent data is not a result of the lack of water metering, but also of the overall data confidentiality in the country. Indeed, due to geopolitical conflicts and national security issues, water data is considered confidential in Lebanon. Customer databases are largely lacking throughout all WEs, making it hard to monitor illegal connections. All these discrepancies in the system do not allow for demand management in the water sector, and the only way WEs are achieving this is through rationing and water supply scheduling. In this context, establishments are not achieving cost recovery, and customers are not relying on public services anymore, paying over five times the actual tariff amount, through informal water supplies (Chahine, 2016).



## 5. SOCIO-ECONOMIC IMPACTS OF WATER SERVICE PROVISION

In cooperation with Oxfam, the Edessa group conducted an environmental and social impact assessment study in Chtaura, in order to upgrade and rehabilitate the water distribution network. The study was presented during the forum by Mr. Jacques Chahine. As part of this study, a detailed socio-economic survey was conducted, to assess the cost of water services to consumers. The surveys covered 16.5% of the households and focused on the Lebanese and Syrian populations. Chtaura gets its water from the Jdita wells, where water is quite abundant, however due to the technical losses not a lot of water is reaching the households. With time, water shortages will become more critical, as demand will increase coupled with significant network losses. The water at the source appears to be clean, however the water at various points across the distribution networks was tested and was revealed to be of poor quality due to the cross contamination with the sewer network. The water distribution network is in poor condition and its supply is intermittent, leading to a lower pressure inside the pipes, and thus increasing the risk of contamination.

The study assessed the income and expenses of the population, the number of households connected to the network, their distribution according to income, the proportion of customers who pay their bills, the perception of public services and finally, the cost of the parallel informal market. The study considered the official water distribution amount set at 1m<sup>3</sup>/household, to compare the amount of water purchased on the parallel market, and the volume of water used through public services. The study revealed the following:

- The average income in the town of Chtaura was calculated at \$800, and more than \$433 of this income is usually spent on food and beverages;
- Only 65% of the households are actually connected to the network. Other households either have private wells or rely on the parallel market, and many of them do not have networks available in their area;
- The distribution of network connections was evaluated in relation to income, and a high proportion of high income households were not connected to the networks. Financial reasons do not appear to drive the lack of connection to the networks. Instead financial stability appears to drive households to rely on the private sector, for more reliable services;
- Of the 65% of the households connected to the network, 48% of them pay their bills. Thus 73% of the people connected are paying their bills, considering that the prices are fair;
- 48% of the users rely on the water provided by public services for drinking purposes, rating it as good quality water;
- However public water service provision is not always provided, as 60% of households are also relying on water trucks as one of the source of water provision. Drinking water is usually provided in the form of water gallons and bottles, or through the water provided by public services;
- The annual subscription fees to the public water services in the BWE are set at 237,500 LL, and is supposed to corresponds to a total of 25,187 L (according to the official water distribution volume of 1m<sup>3</sup>/household/day). Due to the intermittent water supply, customers are instead paying over



1,171,308 LL per year, for only 4,813 L/month, which represents only 16% of the monthly water needs. The parallel market is therefore 5 times more expensive than the price of public water services. Cost is never an issue for public service; it's just the unavailability of water which pushes consumers to pay such high prices.

To sum up, households are generally willing to subscribe to the public water supply, and would pay much less, if water was readily available, however this is not the case. The responsibility lies in the hands of WEs, to provide the required level services. The rehabilitation of the water network could reduce the cost to water establishment, through reduced number of pumping hours, and fewer losses and maintenance, while also providing savings on the consumers' end. Drinking water is mostly acquired from the private sector, through the purchasing of water gallons and water. It will take more time for the population to trust and accept to rely on public water for drinking purposes. In parallel WEs will need to provide drinking water of proper quality, and which meets national standards.



## 6. WATER GOVERNANCE, INTEGRITY AND ACCOUNTABILITY

This section discusses integrity, governance and accountability in the water sector. The first presentation discusses the modernization of the public procurement system, to enhance water integrity, presented by the central tender board (Samneh & Deeb, 2016). In Lebanon the CTB (Central of Tender Board) has to review all the bidding documents of tenders which are above the threshold of 100 million LL. All ministries have to send their bidding documents to the CTB for reviewing, in order to see if there are any clauses and statements that might hinder the tendering process such as limiting competition or inadequate specifications.

In January 2016 20 water projects were awarded by the CTB such as well drilling, dam maintenance, water distribution networks and lines, stream protection walls, sewer lines and irrigation canals, with a total cost of almost \$16 million. Currently, there legal reforms are being initiated, as a draft law for public procurement is being drafted, which shift CTB's role towards a more regulatory one. The aim of this law is to promote fairness accountability, and transparency, by ensuring the implementation of certain standards which are not enforceable by law (such as LIBNOR standards). The CTB's role would be to ensure that every bidding document they receive includes the term which enforces them to abide by those standards. However this law is still not completely drafted. In parallel, the CTB is enhancing its internal practices through the development of an internal management system, and the development of a database of the bidding documents for better monitoring. The CTB also aims to enhance transparency through the development of a new website, containing reporting information, statistics, archives guidelines and regulatory information, which will be accessible in the public, explaining the decision-making process in the water sector.

The other presentation presented by Dr. Nadim Farajalla discussed water governance and integrity in Lebanon. The primary and secondary stakeholders related to water governance in the sector were discussed (detailed in the background section). Integrity was defined as 'the adherence of stakeholders and institutions to governance principles of transparency, accountability and participation in water resources management, based on core values of honesty, equity and professionalism' (Farajalla, 2016). The study aimed to assess the understanding and perception of the concept of integrity and its incorporation in current legislations, the main causes of corruption, the challenges to achieving water integrity and the way forward, through interviews with over 60 primary and secondary stakeholders. The study revealed the following:

- The main causes for corruption were revealed to be the following: lack of awareness of corruption and its consequences, absence of anti-corruption agencies, weak legal framework and lack of monitoring, and the post-war structure of Lebanon which led to the competition for state resources. This has placed Lebanon at the bottom of the list of National Integrity Processes (#127 out of 177);
- Existing water initiatives that include integrity components are only limited to the NWSS, Law 444/2002 and the ENPI (European Neighborhood and Partnership Instrument) Report (Towards a Shared Environmental System);
- Lebanon's fragmented legislation and weak enforcement mechanisms are major challenges to achieving water integrity. This has been apparent through to the lack of operational decrees for the existing laws, the poor coordination between relevant ministries, the weak legal prosecution, the

political deadlock, the long processes or delays in the ratifications of laws by the Parliament and the cabinet, the lack of accountability mechanisms and the corruption within monitoring agencies and others;

- Issues pertaining to the resource itself have further aggravated the corruption within the water sector, due to uncontrolled access to groundwater, illegal connections and over- abstraction. These issues have been caused partly due to the lack of monitoring and enforcement mechanisms;
- The lack of water data and information has also been a challenge to achieving water integrity, due to information hoarding by institutes and the lack of collaboration between academic institutions, policy-makers and other relevant stakeholders;
- Absence of budgeting (mentioned in section 3 of the report) and human resources issues (discrimination, nepotism, payments for promotion etc.) also were identified obstacles;
- Finally other obstacles were identified to be the public procurement services (lacking transparency), the inequitable distribution of resources (political favoritism) and the parallel water market.

The study's recommendations proposed the development of a national anti-corruption strategy through the revival of the existing draft law. This strategy tackles four main areas:

- Political corruption (developing an online portal for whistleblowers and reviewing and updating corruption related laws);
- Petty and bureaucratic corruption (minimizing the bureaucratic procedures through the development of online procedures and platforms, while ensuring public access to relevant information);
- Grand corruption (ensuring transparency in procurement and public works, through an online public tracking system and the development of a monitoring committee);
- Human aspect (which targets an improved salary of employees in the public sector).

The final session is presented below and addresses a summary of the overarching recommendations proposed throughout the forum. Most of the recommendations were presented during the roundtable discussion, including cross-cutting recommendations from individual presentations.

## 7. SYNTHESIS OF ROUNDTABLE DISCUSSION AND AUTHORS' RECOMMENDATIONS

### 1. Implementation of a new Tariff Strategy

In light of the mentioned challenges, the suggested overarching solution is to introduce and implement a new tariff system for all sectors (drinking water, irrigation and wastewater) which promotes volumetric charges. Given the focus of the forum, solutions pertained to drinking water only. Based on prevailing socio-economic conditions, the water tariff strategy should take into consideration the following principles (Melki, 2016):

- Economic efficiency: water resources should be used at the lowest social cost, from a financial, resource and environmental perspective;
- Cost-recovery: revenues should be sufficient to meet the comprehensive financial needs of WEs;
- Fairness: tariffs should treat all consumers equally; cross subsidization should be used as a last resort;
- Financial stability: risks should be minimized in the face of unexpected fluctuations.

The new water tariff strategy should be driven by demand management; its main components should be metering, billing and collecting. One of the first conditions of introducing a consumption based tariff is knowing how much is being produced, distributed and consumed. This would be primarily achieved through the installation of water meters, which have been proved to increase profit, decrease NRW, increase water conservation and improve efficiency of the WEs' performance, globally. Furthermore, according to recent pilot projects, the installation of water meters would not increase water fees for customers; the average consumer would pay the same annual consumption fee (in some cases lower fees) and only a small proportion of consumers will be paying higher fees. The billing and collecting components are equally essential, in order to properly enforce and monitor the new water tariff strategy. In this context, a smooth transition towards water meter installations could be achieved through the implementation of an enterprise resource planning system. This system would enable WEs to adequately manage water meter data, while also ensuring the provision of an adequate service and monitoring customer satisfaction. WEs will also be required to develop a customer database (preferably a computerized database), to properly document customer compliance and collection of bills. Private sector participation could also facilitate this process, and improve customer service relations through the development of money-transfer services and online payments.

Before setting the new tariff system, some preliminary actions should be taken into consideration (Melki, 2016; Saliba, 2016):

- Promote awareness about tariff changes, water meters and the socio-economic benefits of this transition;
- Conduct preliminary studies to assess the impact of tariff changes on different types consumption (through the use of the elasticity of demand);
- Once identified, the impact of these tariff changes will be reflected in demand patterns;



- Identify public willingness to pay a consumption fee through customer satisfaction and perception surveys;
- Ensure a transitional phase between the current and future water tariff (introduce semiannual payments);
- Temporarily maintain the current lump-sum tariff for unmetered customers;
- Allocate tariffs equally to all citizens, without resorting to cross-subsidy;
- Any tariff increase should be subject to a cost-benefit analysis, ensuring the coverage of O&M costs.

The impact of the system on the revenue of the establishments was considered central when trying to identify the structure and components of the new tariff system. There was a general consensus during the forum about the division of the water tariff into two components one blocked and one progressive. Various approaches to the development of the volumetric tariff structure were suggested, they included the following components:

- Set a minimal tariff, which should be paid whether water is being consumed or not;
- In the first phase, tariffs should be set to cover only O&M costs, while governmental investment should be set for infrastructural costs and subsidies;
- After having crossed the transitional phase, WEs can move towards proper cost recovery and can cover depreciation costs of existing assets, debt service or financing costs, replacement and expansion costs, profit margins and even include environmental rates;
- Consider increasing block-rate (IBR) tariffs, which are tariff structures in which the rate per unit of water increases as the volume of consumption increases as represented in the figure below;

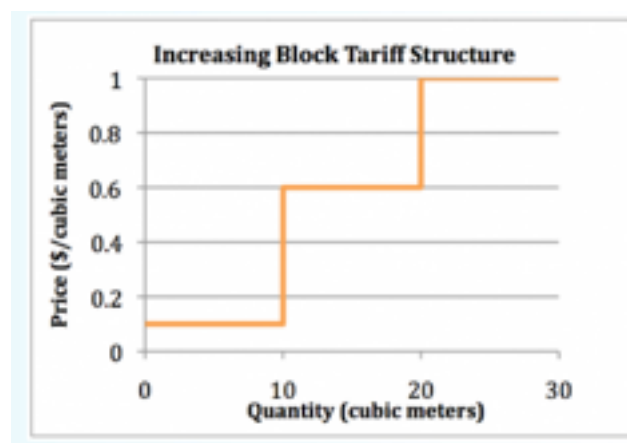


Figure 1. Increasing Block Tariff Structure (WHITTINGTON, 2006)

- Revenues from fixed components should cover fixed costs, such as staff and recurrent maintenance costs, since they are independent of the volume of water supplied to the system, and revenues from variable components should cover variable costs such as energy and chemicals used.

WEs should also develop performance indicators, to evaluate the efficiency of this strategy such as total NRW, cost recovery, service coverage (served population over total population) and hours of supply.

## **2. Legislative reforms in the water sector**

There is an eminent need to update Law 221, in order to overcome the wide discrepancies set by its implementation. Reforms should be directed towards setting a clear delineation of the roles and responsibilities of water authorities and promoting proper coordination amongst them to improve the performance of WEs. Reforms should also address the restructuring of functions of both WEs and the MoEW, in order to enhance their specific duties, in line with NWSS. WEs should benefit from enforced planning and capital spending responsibilities, whereas MoEW should be allocated decisive power for policy-making. Furthermore, the NWSS issued in 2010 does not reflect the current situation in Lebanon (not even accounting for the impact of the Syrian crisis on water resources). Thus there is a need to revise this strategy and update its goals, in light of recent changes. The legislative gaps inherent to Law 221 could also be amended through the implementation of the 'Water Code', which requires finalization.

## **3. Empower WEs towards achieving administrative autonomy**

Providing WEs with the adequate resources to achieve financial and managerial autonomy is highly necessary. This can be achieved through an improved organization for technical and managerial functions of WEs (in which establishments are mostly lacking). The current staff of WEs are mostly hired as contractors for temporary periods, for O&M. Thus it is crucial to improve policies and procedures of human resourcing at these public institutions. The improvement of these functions should then be reflected in the provision of manpower, having adequate capabilities and maintaining such levels through continuous training.

## **4. Introduce a monitoring mechanism**

WEs should enforce a monitoring mechanism, in order to overcome illegal uses of water and unpaid bills. The installment of water meters will facilitate this mechanism, but should also be complemented by the development of a customer database, and an online payment system. These monitoring systems will measure water consumption and subsequently help rationalize its consumption, while also singling out law-breakers. WEs should also disconnect water when bills are not being paid.

## **5. Private sector participation**

Enabling private sector participation on various levels could support the reinforcement of certain functions at WEs in terms of customer relations, customer database management, communication, and water meters reading. Other forms of private sector participation such as leases, concessions or divestiture arrangements could be considered. The private sector could greatly help WEs in overcoming financial deficiencies.

## **6. Water data and information**

Enhance accessibility and availability of data and information through the formation of a national water projects' database through a coordination amongst WEs MoEW, and other stakeholders in the water sector. To enable better access to information, this database should be backed up by the passage of a law to enable data access and availability.

## **7. Public Awareness**

Public awareness is clearly warranted, in both rural and urban areas regarding water conservation, the importance of cost recovery, the benefits of water metering and the entitled civil duties and responsibilities of the public.

## 8. CONCLUSION

In conclusion, the Lebanon Water Forum has been a success, in bringing together diverse water set of stakeholder from governmental authorities and their institutions, service providers, academics, experts and practitioners to discuss pertinent water related issues and provide cross-cutting recommendation to WEs, which were capitalized on from field experience. In this context, a major emphasis was placed on the need to implement a new tariff system, which would help them overcome financial deficits and achieve greater levels of cost recovery.

Although the agricultural sector is the major consumer of water resources, little attention was drawn to water used for irrigation, mainly because WEs have been facing internal issues which they need to overcome, in order to extend their services to the other sectors of irrigation water and wastewater service provision. Thus other types of water consumption (wastewater and irrigation) need to be incorporated in future forum meetings. Furthermore, discussions pertaining to the management of the informal sector were also lacking in the forum. Although there is a general consensus that water metering and enhanced monitoring mechanisms would decrease illegal provision and uses of water resources, there is no guarantee that the informal sector will not compete against the public sector, once the new tariff system has been implemented. Thus there is a need to consider the issue of the informal sector in future meetings.



# REFERENCES

- Chahine, J. (2016). Real Cost of Water Services to Consumers, A Detailed Socio-Economic Study Conducted in Chtaura, Bekaa. Retrieved from: <https://www.youtube.com/watch?v=kmNlOlTdUqw>
- Farajalla, N. (2016). Water Governance and Integrity in Lebanon. Retrieved from: <https://www.youtube.com/watch?v=kmNlOlTdUqw>
- Farajalla, N., Kerkezian, S., Farhat, Z., El Hajj, R., & Matta, M. (2015). The Way Forward to Safeguard Water in Lebanon: National Water Integrity Risk Assessment. Retrieved from: [https://www.aub.edu.lb/ifi/publications/Documents/research\\_reports/20150429\\_CC\\_Water\\_Summary.pdf](https://www.aub.edu.lb/ifi/publications/Documents/research_reports/20150429_CC_Water_Summary.pdf)
- Melki, R. (2016). Water Tariffs and Cost Recovery Mechanisms in Lebanon. Retrieved from: <https://www.youtube.com/watch?v=N1WaBMt7alo>
- Ministry of Energy and Water (MoEW). (2010). National Water Sector Strategy. Retrieved from: <http://www.databank.com.lb/docs/National%20Water%20Sector%20Strategy%202010-2020.pdf>
- Perpaoli, M. (2016). Survey: The Introduction of Water Demand Management Measures in Rural Areas in Lebanon. Retrieved from: <https://www.youtube.com/watch?v=N1WaBMt7alo>
- Saliba, S. (2016). Water Balance Case Studies of Lebanese Water Utilities – Challenges and Opportunities. Retrieved from: <https://www.youtube.com/watch?v=N1WaBMt7alo>
- Samneh, B., & Deeb, H. (2016). Modernizing the Public Procurement System to Enhance Water Integrity in Lebanon. Retrieved from: <https://www.youtube.com/watch?v=kmNlOlTdUqw>
- United States Agency for International Development (USAID). (2013). Litani River Basin Management Support Program- Establishment of a water federation of municipalities. Retrieved from: <http://www.litani.gov.lb/wp/wp-content/uploads/LRBMS/017-LRBMS-ESTABLISHMENT%20OF%20A%20WATER%20FEDERATION%20OF%20MUNICIPALITIES.pdf>
- WHITTINGTON, D. (2006): Pricing Water and Sanitation Services. Human Development Report 2006. Human development office-occasional paper. New York: UNDP. Retrieved from: <http://hdr.undp.org/sites/default/files/whittington.pdf>



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