PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE

Report No.: PIDA7388

Project Name	Lebanon-Water Supply Augmentation Project (P125184)
Region	MIDDLE EAST AND NORTH AFRICA
Country	Lebanon
Sector(s)	General water, sanitation and flood protection sector (100%)
Theme(s)	Water resource management (80%), Other public sector governance (20%)
Lending Instrument	Specific Investment Loan
Project ID	P125184
Borrower(s)	Lebanese Republic
Implementing Agency	Council for Development and Reconstruction
Environmental Category	A-Full Assessment
Date PID Prepared/Updated	12-Jun-2014
Date PID Approved/Disclosed	13-Jun-2014
Estimated Date of Appraisal Completion	21-Jun-2014
Estimated Date of Board Approval	30-Sep-2014
Decision	

I. Project Context

Country Context

Lebanon is a small, highly urbanized, upper middle-income country with a population of approximately 4.4 million people, 88 percent of whom live in the narrow urban stretch spanning the cities of Tripoli in the north and Saida in the south. Services and industry contribute an average of 73.2 percent and 20.5 percent respectively to the Lebanese Gross Domestic Product (GDP). Agriculture consumes over 60 percent of available water and employs over 20 percent of the labor force but only contributes an average of six percent per year to GDP.

In 2012, Lebanon's average GDP per capita was approximately USD 9,705. The service-based economy remains, however vulnerable to internal security and political challenges as well as external shocks and regional instability. While real GDP growth was eight percent per year from 2007 to 2010, it slowed to three percent in 2011 reflecting spillover of the Arab Spring as well as the ongoing conflict in neighboring Syria.

Lebanon ranks 72 out of 187 countries in the 2013 Human Development Index, an improvement of three points since 2007. While Lebanon has successfully closed its health and survival gap index and claims high educational outcomes among females and males, the 2013 World Economic Forum

ranks Lebanon 123 out of 136 in the Global Gender Gap Index, with a significant gender gap in access to and participation in political and economic spheres in particular.

Lebanon's governance structure reflects its mosaic of 17 different sects and ensures that most public affairs issues are subject to consensus among the major groups of the Government. This is an aspect of governance deeply embedded in the Constitution and has many virtues in the Lebanese context. The downside of this arrangement is that it has paralyzed structural reforms in the absence of full consensus and has challenged the Government's ability to take decisive actions to address key economic and social needs, including those related to capital investments in large infrastructure. Coupled with recurring security events, the creation of an enabling environment for sustainable economic and social development has thus been impeded.

Approximately 28 percent of the Lebanese population, equivalent to one million people, live under the upper poverty line of USD 4 per person per day. Eight percent of the population lives in extreme poverty and, at less than USD 2.4 per person per day, are unable to meet their most basic food and non-food needs. Low-income women carry the largest burden of poverty . The poor are further most significantly impacted by the financial burden of expensive and ineffective infrastructure services .

The recent influx of over one million Syrian refugees into Lebanon (equivalent to 24 percent of Lebanon's pre-crisis population) has significantly impacted Lebanon. A joint World Bank – UN study found that in particular, local governments and service utilities across Lebanon are directly impacted by the additional costs of infrastructure, operation and maintenance and the need to coordinate and extend immediate basic services to both refugees and host communities . Already facing acute pre-crisis challenges in the water sector for example, Lebanese systems must now meet an additional estimated water demand of 26.1 million m3/year, equivalent to seven percent of the pre-crisis demand. Between 2012 and 2014 alone, the cumulative fiscal impact in the water sector reached approximately USD 18 million. USD 340-375 million is required for stabilization interventions to reinstate pre-crisis levels of water supply and sanitation service to host and refugee communities.

Averaging 391 persons per square kilometer (km2), Lebanon is ranked as one of the most densely populated countries in the world. Over 2.2 million people (i.e. approximately half of the population) live in the Greater Beirut and Mount Lebanon (GBML) region, which only comprises 20 percent of the country's total land area. The GBML region is a major hub for public sector, private sector and tourist activity and converges a majority of religious and ethnic Lebanese groups. Highly urbanized, the GBML is home to an estimated 506,000 people living below the poverty line (USD 4 per day).

Sectoral and institutional Context

Despite its relatively abundant water resources, Lebanon is significantly water-stressed with water availability falling short of international standards by over 150 m3 per person every year. Groundwater is over-extracted by an average of 200 million cubic meters (MCM) every year. Lebanon further only stores 6 percent of its total water resources, rendering it the country with the lowest dam capacity across the MENA region .

Extreme weather events are already common and fluctuate between winter floods and summer droughts, both a result of insufficient infrastructure and inefficient water management practices.

Water deficits across Lebanon are currently estimated at 373 million cubic meters (MCM) and are expected to increase by 30 percent to 482 MCM by 2035.

Lebanon's climatic and geographic characteristics cause significant variations in water availability, with floods common in the winter, followed by droughts in the summer. Groundwater aquifers prevalent across Lebanon have historically played an important role in buffering the natural water cycle, and also provide the principal source of water supply. Effectively, up to the early 1970's, Lebanon had ample water supply, provided continuous water services to users and was able to rely primarily on its aquifers as both a source of water supply and de facto storage capacity. The construction of the large Qaroun Dam and Litani Hydroelectric Project as well as promulgation of Decree 14522 on inter-basin transfers of major Lebanese rivers, are further examples of milestone water management actions taken by the Government in an effort to optimize water resources management during this period.

The sixteen-year civil war, which ended in 1991, had a devastating effect on the Lebanese water sector. In addition to the near total destruction of infrastructure, the war led to rapid urbanization of Beirut and its neighboring cities. Combined, these factors led to a significant reduction in per capita water availability, and pollution of local aquifers, as a result of untreated discharge of large volumes of wastewater.

Government embarked on a widespread development post-war program to rebuild the country's infrastructure including the water sector. The program was however implemented largely in the absence of an integrated strategy for overall improved water resources management and service delivery. Longstanding political deadlocks on the prioritization of national infrastructure investments further impeded the Government from making the much needed investments in surface water storage.

The institutional reform program set in motion by Law 221 in 2000 were also designed to increase accountability for results at two levels within the water sector. First, the respective obligations and rights of public agencies for the delivery of water services would be clarified. The newly created Regional Water Establishments (RWE's) were to be empowered by the local governance structure and financial and managerial autonomy that would allow them to raise the efficiency of expenditures and services, human resource effectiveness and benchmarking to deliver quality water services. Government would provide investment resources, supervision and support. Second, the reforms were designed to create a reciprocal accountability between customers and the RWEs.

Significant delays and weaknesses impeded the full implementation of Law 221, namely: (i) the institutional and legal framework envisaged was not effectively implemented; (ii) poor coordination within government entities led to continued fragmentation of responsibilities for investment planning and execution; and (iii) partial implementation of a delegated model of service provision was not complemented by a parallel effort to strengthen central government oversight over the water sector.

2012 National Water Sector Strategy

Following a major revival of the Ministry of Energy and Water (MOEW) in 2006, and recognizing the need for urgent action, GoL developed the National Water Sector Strategy (NWSS), with the objective of developing a comprehensive, multi-sectoral plan for improved water resources

management across Lebanon. The Government-led NWSS was developed by a team of qualified local experts, widely consulted and disseminated.

The NWSS was approved by Parliament in 2012, thereby reaching critical national consensus on priorities in water sector investment projects. To date, several key components of the NWSS have been implemented including:

- Transformational infrastructure investments including: (i) the Canal 800 Irrigation Extension project, which will significantly improve the livelihoods of rural and farming communities in the south of Lebanon and (ii) the Greater Beirut Water Supply Project (GBWSP), which will meet the GBML's immediate needs for water supply;
- Rehabilitation and replacement of over 500 kilometers of water distribution networks across major Lebanese cities;
- Implementation of a national water savings subsidy program to encourage the use of water-efficient devices and water conservation;
- Pilot sanitation tariff and investment in wastewater collection and treatment networks across Lebanon; and
- Public Private Partnership Water Law for increased private sector participation in the water sector.

Water in the Greater Beirut and Mount Lebanon region

As one of the most densely populated regions in Lebanon, the GBML is directly and significantly impacted by existing water deficits. During the six month summer period spanning May – October, the GBML region enters into water crisis, wherein the majority of its 2.2 million residents receive less than three hours of potable water per day on average, and rely instead on over 20,000 private wells to supply their water needs. This in turn puts significant pressure on the coastal aquifer underlying Beirut, which, as a result, is exploited at unsustainable levels.

The Beirut Mount Lebanon Water Establishment (BMLWE) is the RWE responsible for the GBML area and serves a population of 2.2 million, including approximately 112,000 low-income households. Established in 2000 through Law 221, the BMLWE operates as a commercial entity, and is headed by a Director General who also chairs the Board. BMLWE currently employs 600 people against authorized staff strength of 1120. The water utility is thus considerably understaffed, mainly due to a longstanding hiring freeze in the Government and natural attrition.

The BMLWE's service areas can be divided into three principal categories namely: (i) the northern GBML; (ii) the southern GBML and (iii) Administrative Beirut. The southern GBML further comprises four distribution zones (Zones A, B, C and D), housing an estimated 1.6 million people. Water sources to the BMLWE currently include 30 springs, 157 public wells and the Shabrouh dam. During the six-month winter period spanning November - April, the BMLWE's springs and wells are recharged by snowmelt, precipitation and spring river discharge. Accordingly, the BMLWE delivers an average of 8 hours of water per day to the GBML region. During the six month summer period however, as the water levels in the springs and wells sharply decrease, the BMLWE is only able to provide an average of 3 hours of water per day to its users.

The BMLWE charges users for water per a flat yearly fee of approximately 170 USD/year for 1 m3/day of water. Despite the low levels of service delivery, BMLWE collections averaged 90 percent in 2013.

Wastewater collection and treatment remain largely decentralized to local municipalities until such time that the three large wastewater treatment plants currently under construction are operational and a cost recovery mechanism for sanitation is agreed. Over 90 percent of GBML residents are connected to a wastewater collection network, which are designed to the national design standard of water consumption of 180 liters/person/day .
GBML water users perceive the quality of water provided to be poor. Thus, in addition to constructing and managing the wells to supplement water supply (a large majority of which are unlicensed and unregulated and produce water of irregular quality), water users must also purchase expensive bottled and tanker water for potable use, at significant additional cost to the average household. Buoyed by a vibrant Lebanese press, several non-government organizations (NGO's) have actively articulated the general public's high levels of dissatisfaction with the level of public water service and environmental degradation.

Faced with these challenges, and following the approval of the 2010- 2014 BMLWE Business Plan (developed with technical assistance from USAID), and the subsequent approval of the National Water Sector Strategy (NWSS), BMLWE embarked on an extensive program of investment to (i) expand its water storage capacity; (ii) reduce non revenue water (NRW) by rehabilitating/replacing distribution networks and (iii) modernize operations.

Recent accomplishments include the implementation of 2010 – 2014 BMLWE Business Plan including: (i) reviewing the integrated waster masterplan for the northern and southern regions of the GBML; (ii) significant investment in critical infrastructure and enabling of private sector participation; and (iii) implementation of a sanitation tariff and metering pilot.

Major investments have included Shabrouh Dam and the GBWSP, on which the BMLWE is contributing 140 million USD in parallel funds (in addition to those of the Bank loan and GoL contributions). BMLWE is thus currently in the midst of a significant investment phase as a means to the sustainable improvement in service delivery in the long term.

BMLWE has also implemented a GIS, SCADA and Customer Information System and continues to move to enterprise accounting, as required by Law 221. The 2015 - 2020 BMLWE Business Plan is currently under development and outlines the institutional strategy for water services in the GBML, reduction in service gaps and improvements to financial sustainability.

A key component of the draft BMLWE Business Plan is the continued increase of storage capacity through the construction of dams and hill lakes.

Alternative Analysis for Water Supply Augmentation

The NWSS identifies three dams (Bisri, Janna and Damour dams) capable of securing water supply to the GBML in the long term . As detailed in the GoL Surface Water Storage Strategy (a sub-component of the NWSS), these three sites were selected following a comprehensive review of the technical, social, economic and environmental factors. While the Janna dam would supply the northern GBML, the Bisri and Damour dams would supply the southern GBML.

Given the significant financial, environmental and social implications of the construction of large dams, an independent review of the Surface Storage Strategy findings was commissioned. A

detailed analysis of alternatives (AA) for water supply augmentation to the GBML was thus undertaken by the Council for Development and Reconstruction (CDR), the GoL agency traditionally responsible for the implementation of large and complex infrastructure.

The AA examined the technical, economic, social and environmental tradeoffs of dams at Bisri, Janna, Damour East and Damour West to augment the volume and stability of water provided to the GBML. The AA also examined five non-dam options namely desalination, groundwater recharge, rainwater harvesting, network leak reduction and wastewater reuse.

The AA was reviewed by the Bank, namely through two independent review teams and a subsequent peer review process that examined the technical, social, environmental and economic aspects of each project, including through several site visits and meetings with GoL officials, technical consultants and NGO's.
Following a series of six public consultations on draft findings , the AA recommended that GBML's long-term water sustainability depends on the implementation of a program of coordinated investments and reforms. Construction of a dam at Bisri was recommended as the immediate next step for water supply augmentation to the GBML due to: (i) the significantly larger volume of water able to be stored there, (ii) the direct impact on water users in the southern regions of the GBML, where a large majority of lower-income groups reside; (iii) the relatively lower environmental and social impacts; (iv) the advanced level of detailed design which would enhance the rate of outcome delivery and (vi) existing financing commitments by select Arab donor funds.

As Governor of Arab Funds in Lebanon, CDR subsequently partnered with the Ministry of Finance (MOF), MOEW and BMLWE to request joint co-financing of the Bisri project from the World Bank and Islamic Development Bank (IDB).

The project will thus finance: (i) the costs of expropriation and resettlement associated with construction of the Bisri dam and reservoir; (ii) construction of the Bisri water supply dam and associated infrastructure and (iii) technical assistance to CDR, MOEW, BMLWE on the operation, maintenance and safety of dams. The project will also finance the continued engagement of the independent Dam Safety, Environment and Social Panels of Experts, Supervision of the Environmental and Social Management Plan (ESMP) and a Project Management Unit (PMU) within CDR.

Reducing Poverty and Boosting Shared Prosperity in the project area

The project will directly benefit the BMLWE, which, upon successful project implementation, will store 116 additional million cubic meters (MCM) of water per year. CDR, BMLWE and MOEW will also directly benefit from technical assistance on sustainable and safe dam operations and urban water service delivery.

The project will deliver benefits to 1.3 million residents across the GBML, located within the BMLWE areas of service provision that are geographically divided into four zones and 21 municipalities. Of the 506,000 people across the GBML that live below USD 4 per day, 460,000 of these are located in the project area.

In order to update information on households which would allow determination of the degree to which the proposed project area covers poor households in GBML, and to determine any specific

needs of poor households to benefit from the project, a specific household survey was undertaken as part of project preparation.

The survey indicates that poverty in the project area is at least as high in GBML as a whole. Half the project survey respondents reported per capita incomes of less than LBP 600,000 LBP (USD 400) per month, or less than the USD 4 per day national poverty line established based on the results of the 2005 survey.

The project survey also indicates that access to water services is correlated to household income. The median hours of access tends to increase with income, suggesting that poorer households experience lower rates of service provision within the sample. Survey results also suggested that households with access to the water service network have a higher average per capita income than those without.

Follow-up focus groups were organized with households in the poorer municipalities in order to determine impediments to benefiting from the planned BMLWE water services. The main request from households was to allow monthly payments against the annual, flat tariff – something which BMLWE is pursuing through adjustment of their billing system. Other measures will be developed as further reforms – including volumetric tariffs are introduced. The geographic identification of poorer households will continue to be used in the context of the GBWSP and Bank and other donor support to BMLWE to ensure that specific needs of the poor are identified to ensure their benefit from service expansion.

II. Proposed Development Objectives

The project development objective is to increase the volume of water available to the Greater Beirut and Mount Lebanon area.

III. Project Description

Component Name

Component 1: Construction and construction supervision of Bisri dam and associated infrastructure

Comments (optional)

Component 1 will finance: (i) the construction and construction supervision of a water supply dam on the Bisri river and twin conveyor pipelines to the existing Joun reservoir; (ii) construction and construction supervision of two hydropower plants, generating 0.2 MW and 10 MW respectively and (iii) expansion of the Ouardaniyeh water treatment plant. The dam works contract will be co-financed by the Islamic Development Bank

Component Name

Component 2: Technical assistance for sustainability of service delivery

Comments (optional)

Component 2 will finance priority activities, complementary to construction of Bisri dam, to ensure the long term sustainability of water service delivery across the GBML. Component 2 will finance: (i) technical assistance to the BMLWE, CDR and MOEW on the operation and maintenance of dams; (ii) technical assistance on management of BMLWE water resources; (iii) development of awareness raising program to prepare for eventual volumetric metering of water supply with particular focus on engaging with and supporting the poor.

Component Name

Component 3: Project Management and Quality Assurance

Comments (optional)

Component 3 will finance: (i) core Project Management Unit (PMU) within CDR to oversee project implementation; (ii) continued engagement of the DSP as per Bank policy requirements; (iii) independent environment and social Panel of Experts and (iv) ESMP Implementation Supervision

Component Name

Component 4: Expropriation and Resettlement Compensation

Comments (optional)

Total project resettlement costs are estimated at 170 MUSD and include: (i) approximately 150 MUSD million for compensation of land acquisition and other assets related to implementation of the Resettlement Action Plan (RAP); (ii) approximately 5 MUSD in assistance for livelihood rehabilitation and monitoring of implementation of the RAP and (iii) approximately 16 MUSD in contingency funds. Component 4 will finance the costs of compensation of land acquisition as well as the cost of assistance for livelihood rehabilitation and monitoring of the RAP implementation

IV. Financing *(in USD Million)*

Total Project Cost:	564.00	Total Bank Financing:	377.00
Financing Gap:	0.00		

For Loans/Credits/Others	**Amount**
Borrower	52.00
International Bank for Reconstruction and Development	377.00
Islamic Development Bank	135.00
Total	564.00

V. Implementation

The project will be implemented by CDR, which has extensive experience with the World Bank's financial, procurement and safeguards requirements on infrastructure projects and, as Governor of Arab Funds in Lebanon, is delegated to implement all projects with co-financing Arab funds, including the Islamic Development Bank (IDB).

A Project Management Unit (PMU) will be established at CDR to manage project implementation. Core PMU members (namely the Project Coordinator, Dam Engineer, Procurement Specialist, Financial Management Specialist, Environmental Specialist and Social Specialist) will be recruited prior to the start of project implementation and will be financed through retroactive financing arrangements, and this to ensure swift and effective start to project implementation after Loan effectiveness.

Given the complexities of the project, both on a technical and institutional level, and the need for sustained coordination for optimized decision making and planning, a project Steering Committee will be established to ensure effective coordination among all stakeholders involved in project preparation and implementation efforts. Project stakeholders will include CDR, MOEW, BMLWE, the Litani River Authority (LRA), Ministry of Environment (MOE) and Ministry of Finance.

Post construction of the dam, the BMLWE will own, operate and maintain the infrastructure, and will liaise closely with the LRA in this regard. This arrangement will ensure that concurrent focus is

provided on the need to balance (i) water security and guaranteed access to water supply for distribution to the Greater Beirut Region and (ii) the technical complexity of operating large dams and hydropower schemes and ensuring the safety of their operations.

The PMU will be responsible for the overall management and implementation of the project monitoring mechanisms and reporting under Components 1, 2,3 and 4. Monitoring tools to be used for the project will include progress reports compiled by the works construction supervision (Component 1), the ESMP Supervision consultant, the PMU (Component 3) and the independent RAP monitoring (Component 4).

The Dam Safety Panel of Experts will carry out periodic supervision of hydrology, seismic assessments, and geotechnical issues related to dam construction and safety. These reports will be used for periodic technical audits of environmental and social safeguard measures. The Dam Safety Panel of Experts will remain on contract to GoL under the first filling of the reservoir, as per OP 4.37 requirements.

An independent Environmental and Social Panel of Experts will also oversee the implementation of the ESMP and will submit its reports to GoL and the PMU.
Monitoring and evaluation of outcomes and results during implementation will follow standard Bank practice. The PMU will collect and present data and reports for bi-annual review by the Project Steering Committee in conjunction with World Bank supervision missions. Discussions during supervision missions related to institutional capacity building, financial viability, technical reviews and site visits would also provide effective means of monitoring progress. The progress reports will be published and will be accessible to managers and decision makers.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	×	
Natural Habitats OP/BP 4.04	×	
Forests OP/BP 4.36		×
Pest Management OP 4.09		×
Physical Cultural Resources OP/BP 4.11	×	
Indigenous Peoples OP/BP 4.10		×
Involuntary Resettlement OP/BP 4.12	×	
Safety of Dams OP/BP 4.37	×	
Projects on International Waterways OP/BP 7.50		×
Projects in Disputed Areas OP/BP 7.60		×

Comments (optional)

VII. Contact point

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