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Report No: PAD2853

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT PAPER

ON A

PROPOSED ADDITIONAL LOAN

IN THE AMOUNT OF
US$ 90 MILLION

TO THE

LEBANESE REPUBLIC

FOR A

THE GREATER BEIRUT WATER SUPPLY PROJECT

MAY 24, 2018

Water Global Practice
Middle East And North Africa Region

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CURRENCY EQUIVALENTS

Exchange Rate Effective April 19, 2018

Currency Unit =	Lebanese Pound (LBP)
LBP 1513 =	US$1

FISCAL YEAR
January 1 - December 31

Regional Vice President:	Hafez M. H. Ghanem
Country Director:	Saroj Kumar Jha
Senior Global Practice Director:	Guang Zhe Chen
Practice Manager:	Carmen Nonay
Task Team Leader(s):	Amal Talbi, Sally Zgheib, Nishtha Mehta

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
BMLWE	Beirut Mount Lebanon Water Establishment
CDR	Council for Development and Reconstruction
cum	Cubic Meters
DA	Designated Account
DMA	District Metered Areas
DO	Development Objective
EA	Economic Analysis
EIRR	Economic Internal Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FM	Financial Management
GBML	Greater Beirut and Mount Lebanon
GDP	Gross Domestic Product
GIS	Geographic Information System
GoL	Government of Lebanon
GRS	Grievance Redress Service
IFR	Interim Financial Report
IP	Implementation Progress
ISR	Implementation Status and Results Report
MoEW	Ministry of Energy and Water
MoF	Ministry of Finance
NPV	Net Present Value
OHS	Occupational Health and Safety
PBC	Performance-based Contract
PDO	Project Development Objective
PFS	Project Financial Statement
PMU	Project Management Unit
RAP	Resettlement Action Plan
RBF	Results-based Financing
SCADA	Supervisory Control and Data Acquisition
SORT	Systematic Operations Risk-rating Tool
STEP	Systematic Tracking and Exchanges in Procurement
TA	Technical Assistance
WASH	Water, Sanitation, and Hygiene
WTP	Water Treatment Plant

BASIC INFORMATION – PARENT (LB- GREATER BEIRUT WATER SUPPLY - P103063)

Country	Product Line	Team Leader(s)		
Lebanon	IBRD/IDA	Amal Talbi		
Project ID	**Financing Instrument**	**Resp CC**	**Req CC**	**Practice Area (Lead)**
P103063	Investment Project Financing	GWA05 (9395)	MNC02 (399)	Water

Implementing Agency: Council for Development & Reconstruction

Is this a regionally tagged project?	
No	

Bank/IFC Collaboration

No

Approval Date	Closing Date		Original Environmental Assessment Category	Current EA Category
16-Dec-2010	30-Jun-2019		Full Assessment (A)	Full Assessment (A)

[ ] Situations of Urgent Need or Capacity Constraints	[ ] Financial Intermediaries (FI)
[ ] Series of Projects (SOP)	[ ] Project-Based Guarantees

Development Objective(s)

The project development objective is to increase the provision of potable water to the residents in the project area within the Greater Beirut region, including those in the low-income neighborhoods of Southern Beirut, and to strengthen the capacity of the BeirutMount Lebanon Water Establishment in utility operations.

Ratings (from Parent ISR)

	Implementation					Latest ISR
	06-May-2016	14-Nov-2016	19-May-2017	07-Jun-2017	14-Nov-2017	14-May-2018
Progress towards achievement of PDO	MS	MS	MS	MU	MS	MS
Overall Implementation Progress (IP)	MS	MS	MS	MS	MS	MS
Overall Safeguards Rating	S	S	S	S	MS	MS
Overall Risk	H	H	H	H	H	H

BASIC INFORMATION – ADDITIONAL FINANCING (Additional Financing for the Greater Beirut Water Supply Project - P165711)

Project ID	Project Name	Additional Financing Type	Urgent Need or Capacity Constraints
P165711	Additional Financing for the Greater Beirut Water Supply Project	Restructuring, Scale Up	No
Financing instrument	Product line	Approval Date	
Investment Project Financing	IBRD/IDA	15-Jun-2018	
Projected Date of Full Disbursement	Bank/IFC Collaboration		
30-Mar-2021	No		
Is this a regionally tagged project?			
No			
[ ] Situations of Urgent Need or Capacity Constraints		[ ] Financial Intermediaries (FI)	
[ ] Series of Projects (SOP)		[ ] Project-Based Guarantees	
[ ] Disbursement-linked Indicators (DLIs)		[ ] Contingent Emergency Response Component	

	(CERC)
[ ] Alternative Procurement Arrangements (APA)	

Disbursement Summary (from Parent ISR)

Source of Funds	Net Commitments	Total Disbursed	Remaining Balance	Disbursed
IBRD	200.00	122.03	77.97	61 %
IDA				%
Grants				%

PROJECT FINANCING DATA – ADDITIONAL FINANCING (Additional Financing for the Greater Beirut Water Supply Project - P165711)

FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	90.00
Total Financing	90.00
of which IBRD/IDA	90.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD) International Bank for Reconstruction and Development (IBRD) International Bank for Reconstruction and Development (IBRD) International Bank for Reconstruction and Development (IBRD)	90.00

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any other Policy waiver(s)?

[ ] Yes [✓] No

INSTITUTIONAL DATA

Practice Area (Lead)

Water

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Amal Talbi	Team Leader (ADM Responsible)		GWA05
Nishtha Mehta	Team Leader		GWA09
Sally Zgheib	Team Leader		GWA05
Sepehr Fotovat Ahmadi	Procurement Specialist (ADM Responsible)		GGOPM
Rima Abdul-Amir Koteiche	Financial Management Specialist		GGOMN
Amal Gerges Chaoul	Team Member		MNCLB
Chaogang Wang	Social Safeguards Specialist		GSU05
George Joseph	Team Member		GWAGP
Jocelyne Jabbour	Team Member		GGOPM
Joel Evan Kolker	Peer Reviewer		GWAGP
Maiada Mahmoud Abdel Fattah Kassem	Team Member		WFACS
Mohammad Farouk Ibrahim Kandeel	Environmental Safeguards Specialist		GEN05
Nada Abou-Rizk	Team Member		MNCLB
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Philippe Marin	Team Member		GWA03
Rock Jabbour	Team Member		GGOMN
Sharon D. C. Faulkner	Team Member		GWA05
Stephane Raphael Dahan	Peer Reviewer		GWA02

Extended Team

Name	Title	Organization	Location
Adrian Iurkiewicz	Groundwater Expert		
Bakhtiar Sohag	Economist		
Bambos Charalambous	Non Revenue Water Expert		

Ezio Todini	Urban Hydrology Expert
Jan Hoffer	Institutional Expert
Jayati sethi	Gender Specialist
Kevin Bender	Commercial Finance Expert
Rado Russev	PPP Expert

LEBANON

ADDITIONAL FINANCING FOR THE GREATER BEIRUT WATER SUPPLY PROJECT

TABLE OF CONTENTS

I. BACKGROUND

A. INTRODUCTION

1. **This Project Paper seeks the approval of the Executive Directors to provide an additional loan in the amount of US$90 million to the Lebanese Republic for the Greater Beirut Water Supply Project (P103063).** The proposed Additional Financing (AF) will meet a financing gap under the parent project and help finance the costs associated with scaling up of investments, and achieving expected results of the project. Specifically, the AF will cover the scale up of: (i) volume of three regional reservoirs that were planned under the project and support supervision and contingency costs associated with the reservoirs; and (ii) utility-strengthening activities, including supporting one performance-based contract (PBC) to monitor pressure meters, identify leakages, and repair pipes as needed in Achrafieh, and one output-based contract for leakage reduction activities, including establishing district metered areas (DMAs) and installing customer meters in parts of North Beirut and Southwest Beirut. The AF will cover the financing gap for: (i) the optional part of the contract for pipelines; and (ii) expropriation costs for two regional reservoirs.

2. **The level two restructuring of the project comprises:** (i) adjustment to the Results Framework (ii) addition of a component (Land Acquisition and Resettlement Compensation); (iii) reallocation of funds from disbursement Category 4 to Category 3; and (iv) an extension of the closing date from June 30, 2019 to November 30, 2020.

3. **The AF is consistent with the Government of Lebanon's (GoL) overall objective** to reconcile economic development with environmental and social sustainability, through better public services for all, especially the poor. The parent project and the AF are also in line with the GoL's recently approved Capital Investment Program, which includes water as one of the priority sectors. The project is also aligned with the World Bank Group's Country Partnership Framework FY17–22 (as discussed by the Board of Executive Directors on July 14, 2016; Report 94768-LB) focus areas of: (i) expanding access to and quality of service delivery; and (ii) expanding economic opportunities and increasing human capital, particularly improving the environment for private sector investment.

4. **The AF is aligned with the World Bank's Middle East and North Africa Strategy.** It contributes towards renewing the social contract, improving resilience to refugee and internally displaced people shocks and assisting in economic recovery, through increased access to basic services. The AF focuses on building infrastructure and improving service delivery using a performance-based approach to shift from intermittent to continuous water supply in selected areas of Beirut, a city which has seen a demographic shift because of the Syrian crisis. All residents in these areas will have access to continuous supply of water for the first time since the end of the civil war. This improvement marks a major contribution toward renewing the social contract for basic service delivery. The AF interventions, through improving demand management and reducing water losses, are also improving the efficiency of infrastructure and services, and helping build resilience to natural shocks, such as droughts. By providing avenues to engage with the private sector through PBCs, the AF will also help in enabling the environment for maximizing finance for development for the sector. The AF will actively support attracting new financing opportunities subject to due diligence. After the closure of the AF, two PBCs will be partially funded through the private sector. In addition, the project will prepare the utility to start the next phase of PBCs.

5. **The proposed AF contributes to closing the high levels of disparity that exist in the project beneficiary zones, where the lowest income quintile faces extreme infrastructure constraints,** by providing increased access to potable water in the Greater Beirut Mount Lebanon (GBML) region, including to the Southern Beirut neighborhoods where over 460,000 people live on less than US$4 per day. Combined, these factors will directly and positively strengthen Lebanon's ability to contribute to the WBG Strategic goals of ending extreme poverty and boosting shared prosperity in a sustainable manner.

B. PROJECT BACKGROUND

6. **The Greater Beirut Water Supply Project was approved on December 16, 2010, and became effective on December 4, 2012.** It was restructured in June 2015 to extend the closing date from June 30, 2016, to the current closing date of June 30, 2019. The total project amount is US$370 million, of which the IBRD loan amount is US$200 million, and the co-financing from the Beirut Mount Lebanon Water Establishment (BMLWE) and the GoL is US$140 million and US$30 million, respectively. The BMLWE and Council for Development and Reconstruction (CDR) implement the project. The BMLWE is a public entity under the oversight of the Ministry of Energy and Water. It has legal, financial and administrative independence. The CDR is an autonomous institution directly accountable to the Council of Ministers through the Prime Minister.

7. **The project contributes to urban water supply security in Greater Beirut Mount Lebanon (GBML), including for low-income areas.** The Project Development Objective (PDO) is to 'increase the provision of potable water to the residents in the project area within the Greater Beirut region, including those in the low-income neighborhoods of Southern Beirut, and to strengthen the capacity of the BMLWE in utility operations.'

C. PROJECT IMPLEMENTATION STATUS

8. **The project is on track to achieve its development objectives (DOs).** Over US$195 million, or about 97.5 percent of the IBRD loan, is committed under ongoing contracts and, as of May 2, 2018, 60.9 percent of the loan has been disbursed. The project was rated Moderately Satisfactory (MS) for achievement of the Development Objective (DO) and Implementation Progress (IP) until June 7, 2017. At that time, the team assessed that while the PDO remained achievable; it was borderline and risky without advancing the contract for the Wardanieh WTP. The implementing agencies fast-tracked the review process. The contract for the Wardanieh WTP was signed in September 2017 and the order to commence works was issued in November 2017. Based on the progress, the Bank team upgraded the DO for the project in November 2017. The project is currently rated Moderately Satisfactory (MS) on the achievement of the DO and IP. An exception to proceed with the AF despite not being consistently rated MS or better for the previous 12 months was approved by management on April 11, 2018.

9. **The overall safeguards ratings for the project have been Satisfactory or Moderately Satisfactory (MS) for over 12 months.** RAP implementation is progressing well. According to the original design of the Wardanieh Water Treatment Plant, the parent project is expected to physically relocate 33 persons. All relocated persons will be compensated in accordance with the RAP. Grievance Redress Mechanisms are established and are functioning well. The project achieved good progress in implementing the environmental and social management plan (ESMP). All contractors have implemented the required ESMP measures during construction and are closely supervised by the engineering

consultants and the implementing agencies. Quarterly progress reports were prepared showing proper implementation of different measures. All safeguard requirements are adequately met. Management approval for the AF to finance the cost of land acquisition and cash compensation associated with resettlement was provided on May 4, 2018.

10. **There are no outstanding procurement issues.** All contracts under the project have been signed and 97.5 percent of the IBRD loan is committed. There are no outstanding project audits. The project complies with all legal covenants except one outstanding entity audit for FY16. Corrective measures were identified and the implementing agencies have already taken steps to mitigate the risk of delays for future audits. To avoid excessive delays in the hiring of the entity external auditor, it was agreed to establish a three-year duration contract with the entity auditor. The contract will cover the entity audits for the years 2017, 2018, and 2019. The auditor for the 2016 entity audit has been hired from project funds and the report is expected to be submitted by August 31, 2018. An exception to proceed with the AF with an outstanding entity audit was approved by management on April 30, 2018.

11. **Component 1: Bulk Water Supply Infrastructure *(US$187.5 million).*** Activities include construction of: (i) two water tunnel conveyors of 3 km and 21 km; (ii) two transmission twin pipelines of 7.6 km and 2.7 km; (iii) three regional reservoirs of 100,000 cubic meters (cum) total capacity; (iv) design, construction and supervision of a Water Treatment Plant (WTP) of 250,000 cum; and (v) all related equipment including pumps and valves. The results achieved to date are: (i) the excavation progress for the tunnel is 18.3 km (76.25 percent) and the twin pipelines were over 60 percent completed; (ii) the works for regional reservoirs and the Wardanieh WTP are ongoing and expected to be completed by the current project closing date of June 30, 2019.

12. **Component 2: Supply Reservoirs, Distribution Network and Metering *(US$2.00 million).*** Activities under this component include: (i) construction of 16 supply reservoirs of storage capacities varying between 500 and 1,000 cum each; (ii) the design, construction and construction supervision of about 187 km of pipeline; (iii) installation of 200,000 household meters in selected areas; and (iv) installation of about 30 bulk water meters at reservoirs and distribution chambers. Results achieved to date are: (i) the construction of the network is completed in all four zones; (ii) the works for the supply reservoirs are advanced and will be completed by June 30, 2018; (iii) the target for the installation of customer meters is being changed to 90,000, of which the contract for 30,000 customer meters is under implementation; and (iv) the bulk water meters are being installed.

13. **Component 3: Project Management, Utility Strengthening and National Studies *(US$10 million).*** The component includes capacity strengthening of the BMLWE and the Ministry of Energy and Water (MoEW). The results achieved to date are: (i) the technical assistance (TA) for design and operation of distribution system to support the transition to continuous water supply has been completed; and (ii) the contracts for establishing the supervisory control and data acquisition and geographic information systems are under implementation.

II. DESCRIPTION AND RATIONALE OF ADDITIONAL FINANCING

A. RATIONALE AND DESCRIPTION OF ADDITIONAL FINANCING

14. **The AF will scale up performance and efficiency of the water service and cover a financing gap.** The AF will improve efficiency of service by facilitating the provision of continuous water supply in parts of Beirut and enhance water saving through reduction of losses. The AF will also allow for increased private sector participation in the sector through the use of innovative tools such as Performance-Based Contracts (PBCs). The financing gap is due to the change in the GoL's financial situation since 2010. At the time of appraisal, the project was expected to cover the entire water supply system – conveyance of water to regional reservoirs, treatment and then distribution through supply reservoirs and a network of pipes. A part of this system was to be financed through the IBRD loan and another part through GoL's own funds. Since 2014, Lebanon has seen over 1.5 million displaced Syrian people move to various parts of the country (that has a population of 4.2 million). The large number of displaced Syrian people has created an unforeseen massive financial burden for the country, which was already struggling to deliver services to local communities after 25 years of civil war. This demographic shock has also placed Lebanon's public finances under severe and rapidly escalating strains. This situation has resulted in a financing gap for project activities including the reservoirs and the optional part of the pipeline contract, and the increase in population requires more water supply through increased storage, demand management, and reduced water losses. Thus, the AF is essential to meet project objectives.

15. **The Syrian conflict has had considerable impact on the Lebanese economy.** In the period between 2011 and 2016, economic growth averaged two percent, compared to the nine percent between 2007 and 2010. Growth for 2017-2018 is expected to reach about 2.7 percent. Because of the slow growth, the standard of living in the country has deteriorated, with the real per capita gross domestic product (GDP) dropping 8.3 percent or US$726 million. Lebanon also continues to face large fiscal deficits, and the Syrian refugee population is straining resources and infrastructure. The direct budget costs of the conflict are estimated at US$400 million per year and the indirect costs exceed US$2.5 billion in terms of the erosion of public services.

16. **From 2012 to 2014, the total budgetary spending by the GoL grew by about US$1.1 billion** because of the Syrian conflict and the associated sharp increase in demand for and consumption of public services due to the increase in population. The cost of reinstating pre-crisis levels of water supply and sanitation services to host and refugee communities is estimated at US$375 million. On the revenue side, spillovers from the conflict in Syria cut an estimated US$1.5 billion in revenue collection over 2012–2014, due to a combination of direct impact on key sectors (for example, tourism) and indirect impacts through weaker economic activity.[1] These shifts affect the project in two ways. First, the water storage requirements have increased to meet the needs of a growing population; and second it is difficult for the Government to meet the funding for the increased storage requirements. The proposed AF will allow the GoL to address this issue. A detailed description of additional activities by component is provided below (see Table 1 for costs by components).

17. **Component 1: Bulk Water Supply Infrastructure *(Additional US$55 million; total US$242.5 million IBRD financing).*** Under the AF, Component 1 will cover the scale-up of three regional reservoirs (US$40 million). The objective of the scaled-up activities is to help the BMLWE meet the additional requirements for storage and potable water in Beirut. Under the project, the total storage capacity of three regional reservoirs in Hadath and Hazmeih is 100,000 cum, while under the AF, the total capacity is proposed to be increased by 20 percent, that is, 120,000 cum. The water from the reservoirs will be transported, in part, through gravity to supply reservoirs. The increase in volume of reservoirs will help increase the overall resilience and efficiency of the system and allow the water distribution system

[1] World Bank. 2013. *Lebanon: Economic and Social Impact of the Syrian Conflict*. Report No. 81098-LB.

to meet the needs of the growing population. The AF Component 1 will also cover financing gaps in the optional part of the contract for the two pipelines (US$10 million) and supervision and contingency costs (US$5 million).

18. **Component 2: Supply Reservoirs, Distribution Network and Metering. *(Additional US$0; total US$2.00 million).*** There will be no changes to the component under the AF.

19. **Component 3: Project Management, Utility Strengthening and National Studies. *(Additional US$20 million; total US$30 million).*** Under the AF, Component 3 is amended to include financing for performance-based and output contracts and their supervision to monitor pressure, identify leakages, repair pipes and minimize water leakage. These activities will allow the BMLWE to prepare the ground to move toward continuous water service for all customers (including displaced people), improve its ability to perform its functions, and partner with the private sector in its operations to deliver better services to its customers. The additional activities will include one PBC to monitor pressure meters, identify leakages, and repair pipes as needed in Achrafieh, and leakage reduction activities including establishing DMAs and installing customer meters in parts of North Beirut and Southwest Beirut. The focus will be on improving urban water management, including resilience (climate change adaptation measures), and sustainability of water use through TA. Activities under the component will also seek to expand job opportunities for female workers in the sector by addressing training gaps in skills acquisition and pathways for career advancement. Ultimately, through this component, the AF will be able to better fulfill the second half of the PDO to 'build capacity for utility operations.'

20. **Component 4: Land Acquisition and Resettlement Compensation *(New Activity; US$15 million).*** This component is added to the Legal Agreement and will include: (i) implementing the resettlement action plan (RAP), including inter alia, providing land acquisitions and resettlement compensation to displaced people; and (ii) monitoring and evaluating the implementation of the RAP. This is a new component under the AF to support expropriation of two regional reservoirs to be built under Component 1. Under the project, GoL was expected to cover all expropriation costs. However, due to the current financial constraints, the cost of expropriation for two regional reservoirs will be covered under the proposed AF. The expropriation decree for these reservoirs has already been issued, and no further land acquisition is required. Management approval for the AF to finance the cost of land acquisition and cash compensation associated with resettlement was provided on May 4, 2018.

Table 1: Cost by Component (US$, millions)

		Project Costs		AF Cost	Total
		IBRD	**Co-Financing**		
A. Component 1: Bulk Water Supply Infrastructure					
	Raw and Treated Water Tunnels	130.00		10.00	140.00
	Water Treatment Plant	2.55	48.45	--	51.00
	Transmission Pipelines and Reservoirs	54.50		42.00	96.50
	Project Management	0.50		0.775	1.275
	Contingencies	*21.5*		2.00	23.5
B. Component 2: Supply Reservoirs, Distribution Network and Metering					
	Distribution and Reservoirs	1.03	39.97	--	41.00

	Metering	1.00	19.00	--	20.00
C. Component 3: Project Management, Utility Strengthening and National Studies					
	Project Management Unit	3.30	1.70	1.00	6.00
	Utility Strengthening and MoEW Capacity for Oversight	3.30	1.70	19.00	24.00
	Studies	3.30	1.70		5.00
D. Component 4: Land Acquisition and Resettlement Compensation					
	Land acquisition of Regional Reservoirs			15.00	15.00
Land Acquisition			30.00		30.00
Taxes			6.00		6.00
Front End Fee		0.500		0.225	0.725
	TOTAL	200.00	170.00	90.00	460.00

21. **All activities are at an advanced stage**. The bidding documents for the regional reservoirs under Component 1 have been completed and submitted to the World Bank team for review, the bidding documents for the PBC under Component 3 have been finalized, and the decree for the expropriation of two regional reservoirs to be completed under Component 4 has already been issued. All activities are expected to be completed by the proposed closing date of November 30, 2020.

22. **Private sector participation**. Under this AF, Component 3 will strengthen the capacity of the BMLWE to build results-based partnerships with the private sector. BMLWE will also pilot the first use of PBCs in Lebanon's water sector, which marks a paradigm shift in contract management. The PBC is a results-based financing (RBF) mechanism, which links payments, rewards and subsidies to the ability of a private operator to meet predetermined performance targets. PBCs are more effective at incentivizing performance and increasing accountability than traditional contracts because part of the payment for services to the private operator is dependent upon achieving performance targets stipulated in the contract between the operator and the public utility. The proposed PBC is a result of a three-year intense TA activity with the BMLWE under the project. This TA has already resulted in establishing 16 DMAs, installing customer meters, and for the last two years, observing customer behaviors (for example, water usage and bill payment behaviors). Under the proposed PBC, BMLWE will contract a private operator to manage the 16 DMAs, and part of the operator's fee will be dependent upon the achievement of water leakage reduction targets in the managed areas. The PBC will improve accountability of public funds and lay a foundation for greater private sector involvement. The operator will train BMLWE staff and transfer all technology on DMA management, maintenance of pressure reducing valves, leak detection scheduling and execution, leak repair management and other activities to the BMLWE. On successful testing of the PBC model, future iterations of PBCs in Beirut will look at requiring private operators to mobilize debt finance for investment in system improvements. The AF addresses institutional and operational aspects through TA to expand and deepen the engagement with the private sector in the medium term.

23. **The AF will also help create an enabling environment to scale up engagement with the private sector in other areas of Beirut, including Southwest Beirut and North Beirut.** The AF will continue the TA to establish DMAs in Southwest Beirut and North Beirut and install meters in these areas, setting the stage for the next generation of PBCs for the utility. The staff of the BMLWE will prepare these two areas for the next generation of PBCs by designing DMAs, installing customers meters, building knowledge on customer behavior, and learning from the Achrafieh example. This expanded scope of the PBC will result in the reduction of water losses and improved efficiency of the BMLWE, thus, providing the foundation to better manage the increase bulk water from the project, the World Bank-funded Water Supply Augmentation Project (P125184), and the on-going infrastructure building activity in Lebanon as per the National Water Sector Strategy. Given the needs of infrastructure in the water sector in Lebanon, the PBC and the resulting improved efficiency, would set the path for the BMLWE to establish credit-worthiness. The BMLWE has already announced to the public the commencement of the customer meter installation program, and will start a customer awareness campaign to improve water use behaviors. In the medium to the longer term, the PBC approach will also enhance BMLWE's ability to access commercial financing to diversify funding sources to operate the water systems in Beirut.

B. OTHER CHANGES

24. **Reallocation of funds.** The level two restructuring of the project includes a reallocation of US$800,000 from disbursement Category 4 to Category 3. As the target for customer meters is being reduced from 200,000 to 90,000, there is a surplus of funds under Category 4, whereas Category 3 has insufficient funds to cover the costs of all included activities. There is no change in the financing of Category 3 and 4 under the project. The reallocation of funds will balance the expenditure category, ensuring that all funds are adequately used under the project.

25. **Addition of a disbursement category.** A disbursement category is being added to reflect the change in financing share for Component 3. Under the project, the World Bank covered 66 percent of Component 3 (for Category 5 only under the project), and counterpart funds covered the remaining 34 percent. Under the AF, 100 percent of the activities in Component 3 (for Category 3 under the AF) will be financed from the IBRD loan.

26. **Results Framework**. The monitoring and evaluation framework has been updated to reflect the extension in closing date and to improve the formulation of some indicators. The following changes have been made (See Table 2).

Table 2: Results Framework Changes

No.	Indicator Name	Type	Change	Reason for Change	Implementing agency
1	New piped household connections for poor households in Southern Beirut	PDO	Revised	To better measure the first part of the PDO that looks at 'increasing the provision of potable water to the residents in the project area within the Greater Beirut region, in particular those in the low-income neighborhoods of Southern Beirut.'	BMLWE
2	Performance-based contract is signed	PDO	New	To better measure the second part of the PDO, 'strengthening the capacity of the BMLWE in utility operations.'	BMLWE
3	Number of piped household water connections that are benefiting from rehabilitation works undertaken by the Project	PDO	Dropped	This is measured under the indicator on number of piped connections resulting from project activities.	BMLWE
4	Number of customers in Greater Beirut Mount Lebanon receiving 24/7 water supply	PDO	Revised	To measure more specifically BMLWE success in providing services, the 'percentage of customers' was changes to 'number of customers'.	BMLWE
5	Grievance redress mechanism established and operational	Intermediate	New	Added to better measure citizen engagement aspects under the AF.	BMLWE CDR
6	Number of leadership and technical trainings conducted for female employees	Intermediate	New	Added to better measure gender aspects under the AF.	BMLWE
7	Female employees satisfied with technical and management skills acquired through trainings	Intermediate	New	Added to better measure gender aspects under the AF.	BMLWE

8	House connections in poor areas	Intermediate	Dropped	This is measured as a part of the PDO-level indicator.	BMLWE
9	PMU staff hired	Intermediate	Dropped	These aspects are managed by the BMLWE and CDR independently and are outside the purview of the Project.	BMLWE CDR
10	Implementation of international accounting standards	Intermediate	Dropped	These aspects are managed by the BMLWE and CDR independently and are outside the purview of the Project.	BMLWE CDR
11	New piped water connections for households	Intermediate	Dropped	Measured as a part of the PBC.	BMLWE
12	Number of studies completed	Intermediate	Dropped	Completed under Government funding and IBRD financing was not required.	BMLWE

III. KEY RISKS

27. **The overall risk of the AF is rated High and the Safeguard Category is 'A' because of the parent project ratings and safeguard category.** On its own, the AF is moderate risk and Category B. These ratings are consistent with the overall project risk at the time of the last Implementation Status and Results Report in February 2018. The Systematic Operations Risk-rating Tool (SORT) is presented in section VII of this document, and the main risks based on implementation experience and associated mitigation measures are described below.

28. **The political and governance risk is High.** The risks include possible delays in Cabinet and Parliament approvals of the proposed AF (Lebanon held national elections in May 2018), as well as security risks due to the geopolitical dynamics in the region. These risks are mitigated by the fact that the Council of Ministers and Parliament now meet regularly and have been following-up on donor-funded projects. The AF is a high priority because it will contribute towards the delivery of water service in GBML, where 40 percent of the country's population lives. The Parliament Joint Committee, which focuses on infrastructure, has expressed its support for investments in the water sector. On February 22, 2018, the committee and the World Bank jointly organized a workshop on the water sector. The committee approved the recommendations of the workshop on how to improve service provision in the country. In terms of the security risks, Lebanon remains a stable country despite some incidents. The AF areas have not witnessed any security incidents or social unrest since project effectiveness.

29. **The macroeconomic risk is High.** Lebanon's debt-to-GDP ratio has increased rapidly in the past few years. The AF will contribute to growth by providing better services, more efficiency, and a return on investment with private sector involvement. The AF provides an enabling environment for medium-to long-term mobilizing of private finance, which will reduce fiscal liabilities.

30. **The sector strategies and policies risk is Substantial.** Even though Lebanon has a National Water Sector Strategy, the water law is not fully implemented, which limits the autonomy of the water establishments. This risk will be mitigated through continuing the TA and capacity building of the BMLWE, the largest water provider in the country, and further advancing the on-going sector dialogue with the MoEW and other stakeholders.

31. **The technical design risk is Substantial**. The Wardanieh WTP is the first design-build-operate contract in the water sector and Component 3 under the AF will support the first PBC in the country. These are innovations in the sector, but also new contract types for the BMLWE to manage. To mitigate this risk, the project has already successfully implemented a strong TA program, which will continue under the AF.

32. **Institutional capacity for implementation and sustainability is Substantial.** This rating is due to the need for continued capacity strengthening of the BMLWE to improve efficiency. The mitigation is to continue with the TA under the AF, including for managing and implementing the PBC, which includes a component on transfer of knowledge.

33. **Fiduciary risk is Substantial.** According to the Project Loan Agreement, the BMLWE is required to submit: (i) quarterly interim financial reports (IFRs); (ii) annual audited project financial statements (PFS); and (iii) annual entity audited financial statements. The IFRs were all submitted in a timely manner. The audited PFS for the year 2017 have been submitted and found acceptable with "unqualified" opinion (clean). The entity audits of BMLWE for the years 2015 and 2016 were late due to delays in the process of recruiting an external auditor for a public entity which requires clearance from Ministry of Finance (MoF). The FY15 entity audit report was submitted, and the auditor for the 2016 entity audit has been hired from project funds and the report is expected to be submitted by August 31, 2018. Corrective measures have been identified and the implementing agencies have already taken steps to mitigate the risk of any future delays. It was agreed that a three-year contract with the entity auditor will be established using project (IBRD) funds. This will cover the entity audits for the years 2017, 2018 and 2019. No project audit reports are overdue.

34. **The Environment and Social risk is Substantial.** The AF will include construction works for the bulk reservoirs that include trenching, scaffolding, and working at heights. The leakage reduction activity may include some trenching. Thus, occupational health and safety (OHS) is a substantial risk. The implementing agencies will ensure that adequate OHS measures are followed. Other risks such as waste management and biodiversity are assessed as moderate. The environmental and social impact assessment (ESIA) addendum includes mitigation measures to minimize risks. The risk associated with resettlement is moderate. The expropriation involved under activities financed by the AF is limited to six landowners and the expropriation measures are presented in the RAP addendum.

IV. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

35. A benefit-cost framework using a 'with' and 'without' AF methodology has been used to calculate the economic internal rate of return (EIRR) and the net present value (NPV) of the AF. The AF will primarily facilitate increased reservoir capacity with extended pipelines. The additional water supply would meet the increased water demand in Beirut and Ein el Delbi incurred due to refugee influx; by ensuring uninterrupted water supply in the 'with-project' scenario. The stream of benefits includes the coping cost (capturing the climate co-benefits such as less energy consumption by the households and tanker water costs) that would be saved due to continuous and direct water supply at the consumption points. The economic analysis (EA) comprises capital cost and the operations and maintenance cost across a 25-year horizon using a discount rate of 10 percent; which is the opportunity cost of capital. For purposes of calculating the NPV of the investment of water supply, the stream of financial cost was adjusted for impacts of taxes, subsidies, and externalities to arrive at the economic value, using an estimated standard conversion factor of 0.96.

36. The NPV of cash flow discounted at 10 percent over a 25-year period is positive, with the EIRR at 15.8 percent. The benefit-over-cost ratio for the same period is 3.8, indicating that for every U.S. dollar spent on this investment there will be an estimated US$3.8 benefit to the economy by benefiting the people of Greater Beirut. The sensitivity of the EIRR due to potential risks to these investments was tested by simultaneously increasing costs and decreasing benefits (a 20 percent increase in capital costs, and 20 percent decrease in benefits, and an extreme case where cost increment and benefit reduction happens simultaneously). This scenario still provided significant net benefits and an EIRR at 13.9 percent, 13.1 percent, and 10.4 percent respectively; which is above the cost of capital. Therefore, the EA carried out for the additional financing indicates economic viability of the financing.

37. Upon its establishment, the BMLWE inherited the cash balance previously accumulated by the Beirut and Mount Lebanon Establishment, and held at the Central Bank. Since 2005, the BMLWE has consistently registered annual cash surpluses between US$18 million to US$32 million per year. As a result, at the time of appraisal for the parent project, the BMLWE had more than US$170 million in cash. A financial analysis based on a cash flow simulation of the BMLWE's revenues and expenses was carried out to assess the impact of the parent project. The assessment found that BMLWE's annual cash surplus would decrease because of project investments as operating costs will increase, while tariffs will be retained at current levels in real terms. However, cash flows will remain positive. A similar financial analysis was conducted for the AF. This analysis was based on the assessment that the Non-Revenue Water (NRW) and customer-surveying activities will have the following positive effects: (i) about 10,000 cum of water saved daily; (ii) 15 percent increase in billed revenues in the project area due to new customers and accurate metering of commercial and industrial clients; and (iii) substantial increase in cash collection (about 97 percent of billed revenue).

38. The PBC will allow for distribution of the risk between the private entity and the public utility, that is, an additional method of ensuring efficient capital expenditure. Based on the assumptions indicated above, incremental cash impact for the utility is estimated to be US$1.9 million per year after project completion. This incremental cash will result in a payback period of slightly more than 10 years and a positive net impact on BMLWE of more than US$8.3 million at the end of 2035. The assessment confirms that leakage reduction and PBCs are beneficial for the BMLWE in terms of the company's cash

balance. The PBC will also bring several positive externalities such as improved water balance, introduction of modern operations tools and techniques, and creating a culture of efficient contract management within the utility.

B. Technical

39. The World Bank has reviewed and confirmed that the proposed investments reflect government priorities and are aligned with strategic sector principles addressing key technical issues. The investments (increase in volume of three reservoirs and implementation of PBCs) to be financed under the AF will increase the volume of water available for distribution and will enable significant improvement in water supply coverage, including provision of continuous water supply in parts of Beirut. The technical design is robust and the bidding documents are already prepared.

40. The PBC is a mechanism that falls under the umbrella of RBF, a term for linking payments, rewards and subsidies to the achievement of predetermined performance targets. PBCs are more effective at incentivizing performance and increasing accountability than traditional contracts. With a PBC, remuneration is based, at least partly, on the achievement of pre-determined outputs or outcomes. As such, PBCs are a paradigm shift and innovation in contract design for the water sector. A PBC for leakage reduction will accelerate the BMLWE's program for upscaling to continuous supply in the most cost-effective way. A three-year technical assistance under the project supported this shift within the BMLWE.

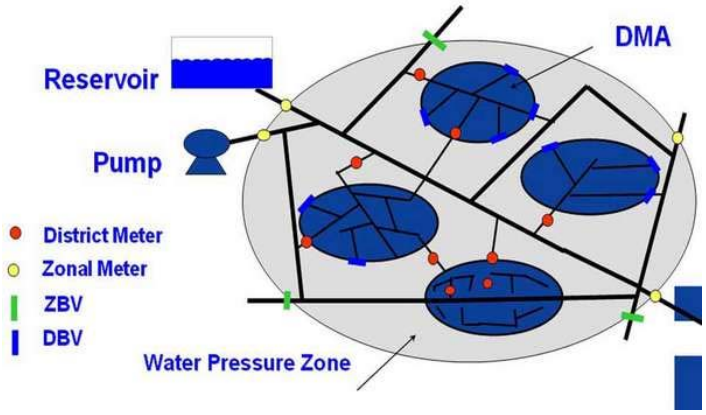
41. During this three-year TA, the BMLWE's ability to reduce leakages and provide service at international standards was enhanced. The TA included pilots to implement continuous water supply using a three-pronged approach. BMLWE is ready to scale up these pilots in areas of Achrafieh, Southwest Beirut and North Beirut. The three-pronged approach consists of: (i) establishing DMAs; (ii) reducing leakages; and (iii) installing flow meters; specifically:

- *Establishing DMAs (discrete hydraulic areas in the distribution network).* The DMAs will enable future installation of customer meters and the transitioning to continuous supply through leakage reduction in an efficient and sustainable way. Figure 1 provides a schematic of DMAs.

- *Reducing leakages.* To reduce leakages in a cost-effective way, the BMLWE needs to provide continuous water supply in DMAs that is monitored for leakage and pressure through flow meters. Training of the BMLWE and transfer of technology will be upscaled through partnerships with the private sector under the PBC.

- *Installing flow meters*. To improve accounting of water and support demand management, the BMLWE will supply, install, and commission customer water meters with a drive-by / walk-by data acquisition metering system for water connections (including, for example, individual households and commercial units) for areas of Southwest and North Beirut. The water meters shall replace the present 'gauges' installed on service connections. The meters will be equipped with a radio transmitter that collects and securely stores consumption data. Each meter location will be geocoded and verified physically to avoid any future billing errors.

Figure 1. Establishing DMAs for Continuous Water Supply[2]



42. **Climate Change.** According to the Think Hazard profile for Lebanon, the Beirut area is at risk for exposure to water scarcity, wildfires, river floods, and high heat. Although precipitation decline for Lebanon is expected to be minor the combination of extensive presence of karstic aquifers, average winter temperature increase and precipitation reduction will heavily affect water resources due to the substantial decrease of the yearly snowpack, which remains the only large reservoir of fresh water made available during the first part of the dry summer months. Some examples of possible climate-related events that have affected the country are: (i) change in the severity and frequency of rainfall storms; (ii) increases in temperature; and (iii) decrease in water availability due to lower than normal precipitation and temperature increase.

43. The BMLWE needs to take a long-term approach to climate change, which requires supply side measures and demand management, which is covered under Component 1 and Component 3 of the proposed AF. Under Component 3, US$19 million will be used for leakage reduction activities, including installing flow meters, pressure monitoring and establishing DMAs. According to Catastrophe Analysis tool (NatCat), Lebanon has incurred US$320 million in natural disaster losses from 2010-2017. Low income populations, such as the 27.4 percent of Lebanese who live below the national poverty line (2014), are particularly vulnerable. Without savings, public services, or early warning systems, they will unable to adapt to climate-induced shocks. As extreme weather disrupts them, they will disrupt social stability. Adapting to these changes requires planning infrastructure to meet future demand, improving water management to address issues of scarcity, particularly in the summer months, and taking steps toward climate-proofing the system by reducing leakage, increasing surface storages and improving the overall performance of the water establishment.

44. The net emissions of the AF are -23,692 tCO_2-eq over the life of the project, while the gross emissions are estimated to be 75,815 tCO_2-eq. On average, the project generates estimated net emissions of -948 tCO_2-eq annually. The reduction of leakages activities under Component 3 are expected to yield net emissions reductions due to energy efficiency gains. The net emissions for the reduction leakages activities break down as follows: -1,857 tCO_2-eq from water conveyance, -12,679 tCO_2-eq from potable water treatment, and -9,157 tCO_2-eq from potable water distribution.

[2] NIUA. 2015. Compendium of Global Good Practices – Urban Water Supply. *http://pearl.niua.org/sites/default/files/books/GP-GL5_WATER.pdf*

C. Financial Management

45. The proposed AF will use the same financial management (FM) arrangements in place for the project. The CDR and BMLWE staff responsible for FM under the project will continue to carry out FM arrangement under the AF. These two agencies will each open and manage separate Designated Accounts (DA) to make payments to finance AF activities. BMLWE will manage one DA (DA-E) for the AF. The CDR will manage two DAs for the AF: a separate DA (DA-D) will be dedicated to the resettlement of the expropriation for displaced people, and another DA (DA-C) will be for all other activities implemented by CDR. All three DAs will be opened in US Dollars at the Central Bank of Lebanon. The implementing agencies will send withdrawal applications to the World Bank to claim advances, replenishments, direct payments, and special commitments.

46. For component 4 "Land Acquisition and Resettlement Compensation", payment to beneficiaries will be done through transfer from the DA-A[3] to a separate operation bank account opened only to reserve the amounts for beneficiary settlements (DA-D). Payment from the operation bank account will be done when beneficiaries can produce official identification documents (refer to the paragraph on expropriation below). CDR will prepare quarterly reports to document all payments made to beneficiaries and pending payments as part of the IFRs. CDR will maintain the reserved funds in the operational bank account after the project's closure for affected people who did not show up during project implementation. Nevertheless, the CDR should submit a request to the Bank for consideration for that purpose. CDR will also need to keep updating the list on an annual basis until final settlement of all beneficiaries is completed, even after project closure. In case the amount exceeds the threshold as set in the project disbursement letter, a direct payment can be made to the beneficiary.

47. This project includes resettlement for displaced people for property expropriated. Additional mitigating measures need to be taken to ensure that settlement is conducted properly and transparently. For the component on expropriation resettlement, CDR will follow the process below:

i. A commission composed of a nominated Judge, evaluation expert, and engineer will be created. This commission will call for hearings in the presence of CDR and beneficiaries related to the land and properties for expropriation. The committee will be responsible for the evaluation of land and property settlement values.
ii. Decision settlement will be issued by the commission.
iii. Based on the Decision settlement, the CDR board issues a decision to reserve funds for the respective beneficiaries for immediate settlement. In case the beneficiary is absent, communication of settlement will be done through publication in newspapers and this is considered official.
iv. A "*main mise*" decision is issued by the CDR to reflect the expropriation of land/property.
v. Upon formal communication of the "*main mise*" decision, the land and property need to be evacuated within 15 days and 30 days, respectively.
vi. The beneficiary is paid upon showing the required identification documents to CDR. The beneficiaries can object to the decision settlement by raising an appeal, and in all cases, the

[3] The designated accounts for the project and the AF are: (i) DA A - Segregate - for CDR (original financing Component 1); DA B - Segregate - for BMLWE (original financing Component 2 and 3); DA C - Segregate - for CDR (additional Financing Component 1); DA D - Segregate - CDR (additional Financing Component 4); DA E - Segregate - for BMLWE (additional financing Component 3)

beneficiary will be paid what has been decided in the decision settlement until the outcome of the appeal is issued, the difference of which, if any, will also be paid.

vii. The affected people using the land or property of a beneficiary can claim settlement through obtaining an attestation from the municipality, and by submitting it to the commission for ruling. Any proceeds decided by the commission to those affected people will be deducted from the beneficiary settlement amount.

48. Under the AF, the retroactive financing of up to US$15 million will be allowed for eligible expenditures under the new Component 4 (Land Acquisition and Resettlement Compensation) that is category 5 of land and involuntary resettlement payments made up to 12 months prior to the date of Loan Agreement signing. Payments for items procured must be in accordance with applicable World Bank procurement procedures. Since project effectiveness, the IFRs and the audited PFSs have all been submitted and found acceptable. As of today, there are no overdue IFRs or overdue audited PFSs.

49. BMLWE will prepare and furnish to the Bank combined unaudited financial reports (IFR) covering both BMLWE and CDR on a quarterly basis. The IFRs will cover the original and the AF loans and will be submitted to the Bank no later than 45 days after the end of each quarter. Each project audit of the Financial Statements, consolidated for both original and additional financing loans, will cover a period of one fiscal year of the Borrower. The PFS will cover both CDR and BMLWE and will be furnished to the Bank no later than six months after the end of each fiscal year. An annual entity audited financial statement related to BMLWE is also required for submission to the Bank no later than nine months after the end of each fiscal year. The disbursement table for the project and the AF is provided below.

Table 3: Expected disbursements

Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Annual (Project & AF)	0	0	0.6	1.62	0.69	46.87	32.7	40	45.71	67.41	**54.4**
Annual Project	0	0	0.6	1.62	0.69	46.87	32.7	40	15.71	42.41	**19.4**
Annual AF	0	0	0	0	0	0	0	0	30.00	25.00	**35.00**
Cumulative	**0**	**0**	**0.6**	**2.22**	**2.91**	**49.77**	**82.48**	**122.48**	**168.19**	**235.6**	**290**

50. The entity audit for the year 2015, which was due on September 30, 2016, was received on April 4, 2018 with a "qualified" audit opinion. BMLWE has agreed with the Bank on a time bound action plan to address the above-mentioned reasons for audit qualifications including: (i) hiring of an accounting firm/consultant to confirm, reconcile, and adjust as necessary the accounting records subject to the qualifications; (ii) hiring of an experienced financial management expert within the Project Management Unit (PMU) to support in strengthening the FM capacity of the entity; and (iii) hiring of an internal auditor to carry out that function for BMLWE.

51. The entity audit for year 2016, which was due by September 30, 2017 is still outstanding. To expedite the hiring of the auditor, it was agreed with BMLWE to have an auditor procured/financed from project funds. The contract was signed on April 25, 2018, and the entity audit report for the year 2016 is expected to be submitted by no later than August 31, 2018. To avoid future delays, it was agreed to establish a three-year contract with the entity auditor (rather than on an annual basis). The contract will cover the entity audits for the years 2017, 2018, and 2019. Exceptions to proceed with project preparation with an outstanding entity audit was sought and approved by management on April 30, 2018.

D. Procurement

52. All new contracts under the AF will follow the World Bank's new Procurement Framework which took effect on July 01, 2016. In accordance with paragraph 5.9 of the 'World Bank Procurement Regulations for IPF Borrowers '(Procurement Regulations) the World Bank's Systematic Tracking and Exchanges in Procurement (STEP) system will be used to prepare, clear, and update procurement plans and conduct all procurement transactions for the project. As such the ongoing contracts, awarded under old procurement Guidelines will not be affected and the new contracts under the AF will be procured using the new regulations. The review thresholds of the new regulations as defined in Procedures are already being applied to the project. The Borrower and the Project Implementing Entities shall ensure that the Project is carried out in accordance with the provisions of the "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006 and revised in January 2011 and as of July 1, 2016 ("Anti-Corruption Guidelines").The PMU has received a preliminary training on the new procurement framework and have experience using the new standard for request for proposals under other projects. Further trainings will be provided. The World Bank team will work closely with CDR and BMLWE to ensure that the implementing agencies are able to transition to the new system and any confusion between the two procurement frameworks is prevented.

53. Major procurement risks are not anticipated. Mitigation measures for any potential risks include close coordination with the CDR, targeted training and capacity building of BMLWE staff, and close supervision. The CDR has handled the procurement of several World Bank Projects, including the parent project, and as such is experienced with World Bank Procurement Guidelines. The BMLWE has dedicated procurement staff managing small contracts. As there are no large contracts under the AF project, the BMLWE is well placed to handle the procurement. The implementing agencies have prepared the Procurement Plan for the AF, which is acceptable to the World Bank. The implementation support for the Project will be further strengthened for the AF by adding a public private partnership expert and a commercial financing expert in the World Bank supervision team.

E. Social (including safeguards)

54. Consistent with the geographical scale of the project and the diversity of its components, and the need for land expropriation, the project was classified as 'Category A', triggering the safeguard policy to prepare a full Environmental and Social Impact Assessment (ESIA) with public consultation. At appraisal, the World Bank's Operational Policy on Involuntary Land Acquisition and Resettlement (OP/BP 4.12) was triggered and will also apply to the AF. The client adopted a Resettlement Action Plan (RAP) (cleared by the World Bank and disclosed to the public) to deal with resettlement issues that might be faced during implementation of the civil works. Public consultations on the ESIA were held on April 12, 2018. The RAP and ESIA addenda prepared for the AF were disclosed both in country and at the World Bank external website on May 2, 2018.

55. A socio-economic survey of the impact of the project was carried out at appraisal and an ESIA was completed. The implementing agencies consulted key stakeholders during project preparation, social screening, and preparation of the RAP for the project. The RAP covered the land expropriation involved in the tunnels, including the access roads, WTP, three regional reservoirs, local water supply reservoirs, pumping stations, and the distribution network. The land expropriation has been completed by following the approved RAP for most project activities except for the Hadath90 and Hazmeih90 regional reservoirs. The BMLWE and CDR have implemented the project ESIA and RAP adequately. The

implementing agencies have also established an adequate Grievance Redress Mechanism (GRM) in accordance with the parent project RAP. Both agencies are addressing the complaints as per the GRM process and procedures. The implementing agencies have prepared an addendum to the ESIA and the RAP. During the preparation of the RAP addendum, all landowners were consulted and the updated inventory has been verified with all the landowners.

56. The overall social impact of the AF is positive as it will improve the water supply services within the Greater Beirut area, including in the low-income neighborhoods in Southern Beirut. The AF will also support the provision of continuous water supply to parts of Beirut and ensure efficient use of the water provided through the tunnel. The expropriation decree for the Hadathe90 reservoir was issued on June 11, 2012, and for Hazmeih90 reservoir on August 28, 2014. The overall activities under the AF remain unchanged. The volume of the reservoirs will be increased through an increase in height, thus there is no need to expand the anticipated expropriation areas. The location, size of land to be expropriated for Hadath90, number of plots, and affected landowners remain the same as in the RAP. The size of land to be expropriated from the same owner for Hazmeih90 is reduced from 7,306 m^2 to 5,646 m^2. The detailed impacts are included in the project RAP and further discussed in the RAP addendum. The ESIA and RAP addenda for the AF have been cleared on April 6, 2018, and disclosed on May 2, 2018. The capacity of the CDR and BMLWE remains adequate to implement the RAP addendum. Additional justification to use AF project proceeds for land expropriation was provided. This was approved by management on May 4, 2018.

57. **Gender.** The AF also has gender-related benefits. In Lebanon, women's educational attainment is at par with that of men. However, more women tend to choose humanities and social science fields and there remains a low pipeline of technically-skilled female workers.[4] Only 29 percent of women opt to study in the fields of engineering, manufacturing, and construction compared to 71 percent of men.[5] Female enrolment in vocational training is lower compared to that of men. In 2009-2010, five percent women were enrolled in the Certificat d'Aptitude Professionelle compared to 95 percent men and 32 percent women enrolled in Brevet Professionnel compared to 68 percent men.[6] In the BMLWE, women make up 20 percent of the total employees and 8 percent of managerial positions. These numbers indicate that there is room to improve women's participation in the sector and in the water establishments. Thus, systematic opportunities for professional development are needed to increase participation and enhance skills. The AF, through targeted training and capacity building activities for women, will improve skills that will help female employees at the water utility take on more technical and management roles.

[4] In addition to low female labor force participation, which stands at 23 percent compared to 71 percent for men, Lebanese women are also under-represented in corporate and manager level positions both in the private and public sectors (European Union 2015). Lebanon's National Action Plan for Women 2017-2019 prioritizes increasing access to skills and leadership development with the objective of enabling women's rise to senior management and decision-making positions across sectors. This priority is also aligned to the World Bank Group Country Partnership Framework, which focuses on addressing gender gaps in human capital development and economic opportunities in Lebanon (World Bank Group 2016).

[5] Central Administration of Statistics. 2012. *Education in Lebanon.* Statistics in Focus (SIF), Central Administration of Statistics, Lebanon, Issue number 3, April 2012.

[6] Ibid.

58. The transition to continuous water supply and new piped household connections supported by the AF is expected to bring a wide range of social benefits to the residents of Beirut. Positive impacts resulting from reduction in time spent accessing water and increased reliability of water supply will accrue in substantial measure to women, who manage the day-to-day water consumption and use in the household. A 2016 survey of gender equality finds that the burden of labour-intensive domestic water use in Lebanon falls primarily on women; 96 percent of women wash clothes compared to 26 percent of men, 93 percent of women clean the bathroom or toilet compared to just 12 percent of men, and 97 percent of women prepare food for the family compared to 64 percent of men.[7]

59. The problem of poor water quality is more severe in urban settings compared to rural areas of Lebanon, where bacteriological contamination can be as high as 90 percent.[8] In certain areas contamination levels from some chemicals are reportedly 10 times higher than World Health Organization's recommended safety benchmarks.[9] The AF's contribution to improvements in water quality will promote the well-being of the general population, and will be particularly favorable to pregnant and lactating women, and young children, who are the most vulnerable to health risks resulting from poor water quality.

60. The AF will support the expansion of technical, operational, and management capacity of the utility, contractors, and other key stakeholders to effectively implement the shift to continuous water supply and promote efficient service delivery. As a part of capacity building activities, the AF will include sub-activities dedicated to expanding opportunities for professional growth and development to female workers in the water sector and will support the utility management to develop a capacity building plan that is tailored to the needs of female workers. Targeted trainings for female employees will seek to build both technical competencies and other skills, such as public speaking and management to facilitate women's increased participation in senior operational, management, and leadership roles in the sector. Thematic areas covered in the trainings will be determined in consultation with utility management and will be tailored based on feedback from female trainees to ensure that the most relevant areas for skills development are addressed. Post-training surveys will collect qualitative data to monitor effectiveness and capture participant feedback, which will then be incorporated in subsequent trainings. Two intermediate results indicators have been included in the project result framework to monitor these actions and track their progress in successfully meeting the identified capacity needs of female employees. Three trainings will be provided over the course of the AF to ensure that a consultative process for both identifying and responding to skills development needs of participants is followed. Through these activities the project aims to build a skilled female workforce that is better prepared to take advantage of new employment opportunities expected with the expansion of the utility's operations. The AF will set the path for female skill development in utilities and improve access to employment opportunities in the long term.

61. **Citizen Engagement.** Public consultations were carried out as part of the preparation of the ESIA addendum. During project implementation, the AF will strengthen citizen engagement aspects by operationalizing an effective and responsive GRM. The GRM will enable a two-way engagement between the BMLWE and the community by facilitating better communication on project activities,

[7] Promundo and UN Women. 2017. *Understanding Masculinities: Results from the International Men and Gender Equality Survey (Images) – Middle East and North Africa 2017*

[8] Inter Agency Water, Sanitation and Hygiene (WASH) Working Group-Lebanon, WASH Strategy, February 2014.

[9] Ministry of Environment, European Union, and United Nations Development Programme, Lebanon Environmental Assessment of the Syrian Conflict and Priority Interventions 2014.

capturing community feedback, and enabling service providers to respond to concerns raised by stakeholders. The AF will also explore the possibility of cross-fertilizing knowledge and experiences between Lebanon's regional water establishments, identifying additional mechanisms to enhance the accountability of water service delivery, and develop citizen engagement processes that can be sustained beyond the scope of the project.

F. Environment (including Safeguards)

62. The overall activities under the AF remain unchanged. The volume of the reservoirs will be increased, without the need to expand the anticipated expropriation areas. As there will be no change in the footprint of the reservoir, no additional environment impacts are expected or triggered. The activities for the leakage reduction will be similar to those executed under the project. The impact is at a smaller scale as excavation works will be limited to the areas where leaks are detected; therefore, no new impacts are envisaged. The project's Environmental and Social Management Plan (ESMP) will also apply to the AF. The implementing agencies, CDR and BMLWE, have applied all the mitigation measures indicated in the ESMP adequately. They have submitted quarterly progress reports regularly. These reports adequately reflect the measures taken to address environmental and social issues in the ESMP. The project's supervision missions found that the Occupational Health and Safety (OHS) measures could be improved. The implementing agencies added the adequate OHS risk mitigation measures to the AF ESIA. The overall environmental safeguards performance is moderately satisfactory as the contractor's Environmental and Social Management Plan progress report for the tunnel was delayed. The report has been submitted and included required updates on environmental management aspects.

63. The implementing agencies prepared an addendum to the project's ESIA. Consultations with stakeholders to inform the ESIA addendum took place on April 12, 2018. Additional consultations will also take place during implementation of the AF. The consultations will be through prior notification through visible signs advising residents of the dates/times of the works. The implementing agencies will communicate the mitigation measures taken by the contractors and encourage residents to share their concerns and suggestions through established platforms. The implementing agencies will document all concerns and suggestions in progress reports.

V. WORLD BANK GRIEVANCE REDRESS

Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit *http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service*. For information on how to submit complaints to the World Bank Inspection Panel, please visit *www.inspectionpanel.org.*

VI. SUMMARY TABLE OF CHANGES

	Changed	Not Changed
Change in Results Framework	✓	
Change in Components and Cost	✓	
Change in Loan Closing Date(s)	✓	
Reallocation between Disbursement Categories	✓	
Change in Disbursements Arrangements	✓	
Change in Safeguard Policies Triggered	✓	
Change in Procurement	✓	
Change in Implementing Agency		✓
Change in Project's Development Objectives		✓
Cancellations Proposed		✓
Change of EA category		✓
Change in Legal Covenants		✓
Change in Institutional Arrangements		✓
Change in Financial Management		✓
Change in APA Reliance		✓
Other Change(s)		✓

VII. DETAILED CHANGE(S)

RESULTS FRAMEWORK

Project Development Objective Indicators

Volume (million cum/year) of additional potable water distributed in the project area (cumulative)
Unit of Measure: Number
Indicator Type: Custom

Baseline	Actual (Current)	End Target	Action

Value	0.00	0.00	45.00	Revised
Date	03-Jan-2011	07-Nov-2017	30-Nov-2020	

New piped household connections for poor households in Southern Beirut
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	4,059.00	20,000.00	Revised
Date	06-Dec-2011	07-Nov-2017	30-Nov-2020	

Number of customers in Greater Beirut Mount Lebanon receiving 24/7 water supply
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	20,000.00	Revised
Date	06-Dec-2011	07-Nov-2017	30-Nov-2020	

Piped household water connections that are benefiting from rehabilitation works undertaken by the project
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	200,000.00	Marked for Deletion
Date	06-Dec-2011	07-Nov-2017	30-Jun-2019	

Performance based contract signed
Unit of Measure: Yes/No
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	No	No	Yes	New
Date	02-Apr-2018	03-Apr-2018	30-Nov-2020	

Intermediate Indicators

Tunnel (kms)
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	11.50	24.00	Revised
Date	04-Jan-2011	07-Nov-2017	30-Nov-2020	

Water treatment plant
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	1.00	Revised
Date	04-Jan-2011	07-Nov-2017	30-Nov-2020	

Transmission lines
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	2.00	Revised
Date	05-Jan-2010	07-Nov-2017	30-Nov-2020	

Bulk reservoirs
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	3.00	Revised
Date	05-Jan-2010	07-Nov-2017	30-Nov-2020	

Supply Reservoirs
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	16.00	Revised
Date	05-Jan-2010	07-Nov-2017	30-Nov-2020	

Pipelines (kms)
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	392.95	395.00	Revised
Date	05-Jan-2016	07-Nov-2017	30-Nov-2020	

Household meters
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	200,000.00	Marked for Deletion
Date	05-Jan-2010	07-Nov-2017	30-Jun-2019	

House connections in poor areas
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	4,059.00	20,000.00	Marked for Deletion
Date	05-Jan-2010	07-Nov-2017	30-Jun-2019	

PMU Staff hired
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	12.00	10.00	Marked for Deletion
Date	05-Jan-2010	07-Nov-2017	30-Jun-2019	

Telemetry/Scada System installed
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	1.00	1.00	Revised
Date	05-Jan-2010	07-Nov-2017	30-Nov-2020	

GIS System Installed
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	1.00	1.00	Revised
Date	05-Jan-2010	07-Nov-2017	30-Nov-2020	

Customer Information System
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	1.00	1.00	Revised
Date	05-Jan-2010	07-Nov-2017	30-Nov-2020	

TA for Design and operation of distribution system for 24/7 supply
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	1.00	1.00	Revised
Date	05-Jan-2010	07-Nov-2017	30-Nov-2020	

Implementation of international accounting standards.
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	1.00	Marked for Deletion
Date	05-Jan-2010	07-Nov-2017	30-Dec-2016	

Studies completed satisfactorily
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	4.00	Marked for Deletion
Date	05-Jan-2010	07-Nov-2017	30-Jun-2019	

Number of leadership and technical trainings conducted for female employees
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	3.00	New
Date	28-Mar-2018	29-Mar-2018	30-Nov-2020	

Grievances responded to and resolved according to GRM processes and procedures
Unit of Measure: Percentage
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	100.00	100.00	New
Date	31-Dec-2010	29-Mar-2018	30-Nov-2020	

Female employees satisfied with technical and management skills acquired through trainings
Unit of Measure: Percentage
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00		70.00	New
Date	28-Mar-2018		30-Nov-2020	

COMPONENTS

Current Component Name	Current Cost (US$, millions)	Action	Proposed Component Name	Proposed Cost (US$, millions)
Component 1: Bulk Water Supply Infrastructure: Tunnels, Water Treatment Plant, Transmission & Bulk Storage.	257.50	Revised	Component 1: Bulk Water Supply Infrastructure	312.27
Component 2: Supply Reservoirs, Distribution Network and Metering.	61.00	No Change	Component 2: Supply Reservoirs, Distribution Network and Metering.	61.00
Component 3: Project Management, Utility Strengthening and National Studies	15.00	Revised	Component 3: Project Management, Utility Strengthening and National Studies	35.00
	0.00	New	Component 4: Land Acquisition and Resettlement Compensation	15.00

TOTAL	**333.50**			**423.27**

LOAN CLOSING DATE(S)

Ln/Cr/Tf	Status	Original Closing	Current Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
IBRD-79670	Effective	30-Jun-2016	30-Jun-2019	30-Nov-2020	30-Mar-2021

REALLOCATION BETWEEN DISBURSEMENT CATEGORIES

Current Allocation	Actuals + Committed	Proposed Allocation	Financing % (Type Total)	
			Current	Proposed
IBRD-79670-001 | Currency: USD				
iLap Category Sequence No: 1	Current Expenditure Category: GO, WKS, CS Parts 1 (a) & (c)			
185,000,000.00	113,871,197.80	185,000,000.00	100.00	100.00
iLap Category Sequence No: 2	Current Expenditure Category: GO, WKS, CS Parts 1(b)			
2,550,000.00	186,923.78	2,550,000.00	5.00	5.00
iLap Category Sequence No: 3	Current Expenditure Category: GO, WKS, CS Parts 2 (a) & (b)			
1,050,000.00	1,090,916.94	1,850,000.00	2.50	2.50
iLap Category Sequence No: 4	Current Expenditure Category: GO, WKS, CS Parts 2 (c) & (d)			
1,000,000.00	0.00	200,000.00	5.00	5.00
iLap Category Sequence No: 5	Current Expenditure Category: GO, CS Part 3 TRG, AUD & IOC			
9,900,000.00	5,431,156.20	9,900,000.00	66.00	66.00
iLap Category Sequence No: 7	Current Expenditure Category: PREMIUM FOR CAPS/COLLARS			
0.00	0.00	0.00		

Total	**199,500,000.00**	**120,580,194.72**	**199,500,000.00**

DISBURSEMENT ARRANGEMENTS

Change in Disbursement Arrangements

Yes

Expected Disbursements (in US$, millions)

Fiscal Year	0000	2011	2012	2013	2014	2015	2016	2017	2018	2019
Annual	0.00	0.00	0.00	0.60	1.62	0.69	46.87	32.70	40.00	45.71
Cumulative	0.00	0.00	0.00	0.60	2.22	2.91	49.77	82.48	122.48	168.19

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Latest ISR Rating	Current Rating
Political and Governance	High	High
Macroeconomic	High	High
Sector Strategies and Policies	Substantial	Substantial
Technical Design of Project or Program	Substantial	Substantial
Institutional Capacity for Implementation and Sustainability	Substantial	Substantial
Fiduciary	Substantial	Substantial
Environment and Social	Substantial	Substantial
Stakeholders	Moderate	Moderate
Other		
Overall	High	High

COMPLIANCE

Change in Safeguard Policies Triggered

Yes

Safeguard Policies Triggered	Current	Proposed

Environmental Assessment OP/BP 4.01	Yes	Yes
Performance Standards for Private Sector Activities OP/BP 4.03	No	No
Natural Habitats OP/BP 4.04	No	No
Forests OP/BP 4.36	No	No
Pest Management OP 4.09	No	No
Physical Cultural Resources OP/BP 4.11	No	No
Indigenous Peoples OP/BP 4.10	No	No
Involuntary Resettlement OP/BP 4.12	Yes	Yes
Safety of Dams OP/BP 4.37	No	No
Projects on International Waterways OP/BP 7.50	No	No
Projects in Disputed Areas OP/BP 7.60	No	No

LEGAL COVENANTS – Additional Financing for the Greater Beirut Water Supply Project (P165711)

Sections and Description
No information available

Conditions

VIII. RESULTS FRAMEWORK AND MONITORING

Results Framework
COUNTRY : Lebanon
Additional Financing for the Greater Beirut Water Supply Project

Project Development Objectives

The project development objective is to increase the provision of potable water to the residents in the project area within the Greater Beirut region, including those in the low-income neighborhoods of Southern Beirut, and to strengthen the capacity of the BeirutMount Lebanon Water Establishment in utility operations.

Project Development Objective Indicators

Action	Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source / Methodology	Responsibility for Data Collection
Revised	Name: Volume (million cum/year) of additional potable water distributed in the project area (cumulative)		Number	0.00	45.00	BMLWE	Bulk meter and Pumping Reports; Subscriber reports	Semi-annual progress report
Description: Additional volume of drinking water supplied through project intervention.								
Revised	Name: New piped household connections for poor households in		Number	0.00	20,000.00	BMLWE	BMLWE Reports	Semi-annual progress report

	Southern Beirut							
Description: Number of house connections for poor households in Southern Beirut part of project area								
Revised	**Name:** Number of customers in Greater Beirut Mount Lebanon receiving 24/7 water supply		Number	0.00	20,000.00	BMLWE	Bulk meter and Pumping Reports; Subscriber reports	Semi-annual progress report
Description: Households in project area receiving 24X7 water supply								
New	**Name:** Performance based contract signed		Yes/No	No	Yes			
Description:								

Intermediate Results Indicators

Action	Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source / Methodology	Responsibility for Data Collection
Revised	**Name:** Tunnel (kms)		Number	0.00	24.00	CDR	Progress Reports	Quarterly
Description:								
Revised	**Name:** Water treatment plant		Number	0.00	1.00	BMLWE	Progress Reports	Quarterly
Description:								

Revised	**Name:** Transmission lines		Number	0.00	2.00	CDR	Progress Reports	Quarterly
Description:								
Revised	**Name:** Bulk reservoirs		Number	0.00	3.00	CDR	Progress Reports	Quarterly
Description:								
Revised	**Name:** Supply Reservoirs		Number	0.00	16.00	BMLWE	Progress Reports	Quarterly
Description:								
Revised	**Name:** Pipelines (kms)		Number	0.00	395.00	BMLWE	Progress Reports	Quarterly
Description:								
Revised	**Name:** Telemetry/Scada System installed		Number	0.00	1.00	BMLWE		
Description:								
Revised	**Name:** GIS System Installed		Number	0.00	1.00	BMLWE		
Description:								
Revised	**Name:** Customer Information System		Number	0.00	1.00	BMLWE		
Description:								
Revised	**Name:** TA for Design and operation of distribution system for		Number	0.00	1.00	BMLWE		

	24/7 supply							
Description:								
New	**Name:** Number of leadership and technical trainings conducted for female employees		Number	0.00	3.00			
Description:								
New	**Name:** Grievances responded to and resolved according to GRM processes and procedures		Percentage	0.00	100.00			
Description:								
New	**Name:** Female employees satisfied with technical and management skills acquired through trainings		Percentage	0.00	70.00			
Description:								

Target Values

Project Development Objective Indicators

Action	Indicator Name	Baseline	End Target
Revised	Volume (million cum/year) of additional potable water distributed in the project area (cumulative)	0.00	45.00
Revised	New piped household connections for poor households in Southern Beirut	0.00	20,000.00
Revised	Number of customers in Greater Beirut Mount Lebanon receiving 24/7 water supply	0.00	20,000.00
New	Performance based contract signed	No	Y

Intermediate Results Indicators

Action	Indicator Name	End Target
Revised	Tunnel (kms)	24.00
Revised	Water treatment plant	1.00
Revised	Transmission lines	2.00
Revised	Bulk reservoirs	3.00
Revised	Supply Reservoirs	16.00
Revised	Pipelines (kms)	395.00
Revised	Telemetry/Scada System installed	1.00
Revised	GIS System Installed	1.00

Revised	Customer Information System	1.00
Revised	TA for Design and operation of distribution system for 24/7 supply	1.00
New	Number of leadership and technical trainings conducted for female employees	3.00
New	Grievances responded to and resolved according to GRM processes and procedures	100.00
New	Female employees satisfied with technical and management skills acquired through trainings	70.00