Document of
The World Bank

Report No: ICR2392

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(TF058085)

ON A

GRANT

IN THE AMOUNT OF US$15 MILLION

TO THE

LEBANESE REPUBLIC

FOR A

WEST BEKA'A EMERGENCY WATER SUPPLY PROJECT

November 14, 2012

Sustainable Development Department
Middle East and North Africa Region

REPUBLIC OF LEBANON – GOVERNMENT FISCAL YEAR
January 1st – December 31th

CURRENCY EQUIVALENTS
(Exchange Rate Effective as of November 14, 2012)

Currency Unit	Lebanese Pound
US$1.00	LBP 1,500

WEIGHTS AND MEASURES
METRIC SYSTEM

ABBREVIATIONS AND ACRONYMS

BRWA	Beka'a Regional Water Authority
BWWP	Ba'albeck Water and Wastewater Project
CDR	Council for Development and Reconstruction
EMP	Environmental Management Plan
FM	Financial Management
GOL	Government of Lebanon
IBRD	International Bank for Reconstruction and Development
IDB	Islamic Development Bank
IO	Intermediate Outcome Indicator
KFAED	Kuwait Fund for Arab Economic Development
KM	Kilometers
MOEW	Ministry of Energy and Water
PDO	Project Development Objectives
MG	Milligrams
ML	Milliliters
PMT	Project Management Team
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
RWA	Regional Water Authority
SOE	Statement of Expenditures
WA	Withdrawal Application
WHO	World Health Organization

Vice President:	Inger Andersen
Country Director:	Ferid Belhaj
Acting Sector Manager:	Richard Pollard
Project Team Leader:	Claire Kfouri
ICR Team Leader:	Claire Kfouri

REPUBLIC OF LEBANON

West Beka'a Emergency Water Supply Project

TABLE OF CONTENTS

A. Basic Information

Country:	Lebanon	Project Name:	West Beka'a Emergency Water Supply Project
Project ID:	P103885	L/C/TF Number(s):	TF-58085
ICR Date:	11/14/2012	ICR Type:	Core ICR
Lending Instrument:	ERL	Borrower:	LEBANESE REPUBLIC
Original Total Commitment:	USD 15.00M	Disbursed Amount:	USD 14.91M
Revised Amount:	USD 15.00M		

Environmental Category: B

Implementing Agencies:

Ministry of Energy and Water
Council for Development and Reconstruction (CDR)
Beka'a Regional Water Authority

Cofinanciers and Other External Partners:

Kuwait Arab Fund for Economic Development (KAFED)

B. Key Dates

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	01/19/2007	Effectiveness:		08/02/2007
Appraisal:	02/06/2007	Restructuring(s):		02/12/2010 11/07/2011
Approval:	03/20/2007	Mid-term Review:	02/03/2010	02/09/2011
		Closing:	05/20/2010	05/20/2012

C. Ratings Summary

C.1 Performance Rating by ICR

Outcomes:	Moderately Satisfactory
Risk to Development Outcome:	Substantial
Bank Performance:	Moderately Unsatisfactory
Borrower Performance:	Moderately Unsatisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Unsatisfactory	Government:	Moderately Unsatisfactory
Quality of Supervision:	Moderately	Implementing	Moderately Satisfactory

	Unsatisfactory	Agency/Agencies:	
Overall Bank Performance:	Moderately Unsatisfactory	**Overall Borrower Performance:**	Moderately Unsatisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating**
Potential Problem Project at any time (Yes/No):	Yes	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Moderately Satisfactory		

D. Sector and Theme Codes		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
Sub-national government administration	5	5
Water supply	95	95
Theme Code (as % of total Bank financing)		
Environmental policies and institutions	25	25
Other human development	50	50
Pollution management and environmental health	25	25

E. Bank Staff		
Positions	**At ICR**	**At Approval**
Vice President:	Inger Andersen	Jean-Louis Sarbib
Country Director:	Ferid Belhaj	Joseph P. Saba
Sector Manager:	Richard W. Pollard	Emmanuel Forestier
Project Team Leader:	Claire Kfouri	Mohammed Benouahi
ICR Team Leader:	Claire Kfouri	
ICR Primary Author:	Samantha M. Constant	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document**)**

1. As stated in the Project Appraisal Document (PAD): "The development objective of the government program for the West Beka'a and World Bank-financed project is to alleviate the precarious conditions of the area's water supply systems, which have been

further aggravated by hostilities and long-term neglect. More specifically, the project was expected to improve health conditions of the population of the West Beka'a through the provision of non-contaminated water in increased quantities by completely rehabilitating the area's water network."

2. The Results Framework more simply expressed the PDO as: "Improved health conditions of population living in the project area." It then proposed the three outcome indicators evaluated below. None of the indicators attempts to measure health outcomes, but the first two could be interpreted as indicators of health conditions related to network water supply.

Revised Project Development Objectives (as approved by original approving authority)
Not Applicable

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Quality of Water (WHO standards met)			
Value quantitative or Qualitative)	Nitrates: 100 mg/l F. Coliform: 10/100 ml.	Nitrates: <10 mg/l F. Coliform: <1/100 ml	N/A	Nitrates: <10 mg/l F. Coliform: <1/100 ml (but see comments)
Date achieved	05/26/2007	05/20/2010		05/20/2012
Comments (incl. % achievement)	Results show that levels of nitrate across the network are well under 10 mg/l and total coliforms average <1/100 ml per month. Residual chlorine is not detected in some network water test results			
Indicator 2 :	Quantity of water supplied			
Value quantitative or Qualitative)	Per capita delivery of water within project area: 60 liters per capita per day (60 l/c/d)	Per capita delivery of water within project area: 100 l/c/d	N/A	Per capita delivery of water to subscribers in the project area: >100 l/c/d.
Date achieved	05/26/2007	05/20/2010		05/20/2012
Comments (incl. % achievement)	The Chamsine Spring plant has a daily production capacity of over 19,000 m3. As the estimated 16,962 households in the service area have an average 5 residents each, delivering 100 liters daily per capita requires less than 8,500 m3/day.			
Indicator 3 :	Increase number of households legally connected to the water supply network			
Value quantitative or Qualitative)	30%	90%	N/A	32%
Date achieved	05/27/2007	05/20/2010		05/20/2012

Comments (incl. % achievement)	As the utility continued distributing water through the old network, the utility has yet to meet its goal of increasing the proportion of households legally connected to the new network.

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Implementation progress is satisfactory and works contracts awarded without delays.			
Value (quantitative or Qualitative)	0%	Timeliness in works schedule and project is expected to be 100% completed by loan closing.	N/A	Despite delays, project was 100% completed by loan closing.
Date achieved	03/01/2007	05/20/2010		05/20/2012
Comments (incl. % achievement)	Political tensions and security concerns resulted in a two-year delay in completing the project infrastructure.			
Indicator 2 :	Percentage of households in the project area with meters installed.			
Value (quantitative or Qualitative)	0%	90%	N/A	32%
Date achieved	03/01/2007	05/20/2010		05/20/2012
Comments (incl. % achievement)	Each legally connected household is metered. This indicator thus tracks PDO Indicator 3.			
Indicator 3 :	The number of kilometers (km) of water supply network rehabilitated.			
Value (quantitative or Qualitative)	0% km	29 km of transmission lines and 80 km of distribution lines rehabilitated.	N/A	20 km of transmission and 174 km of distribution lines
Date achieved	03/01/2007	05/20/2010		05/20/2012
Comments (incl. % achievement)	Network design was modified during implementation, reducing the total length of transmission lines to be constructed but increasing the length of distribution lines. In most cases, new lines were laid rather than rehabilitating old lines.			

G. Ratings of Project Performance in ISRs

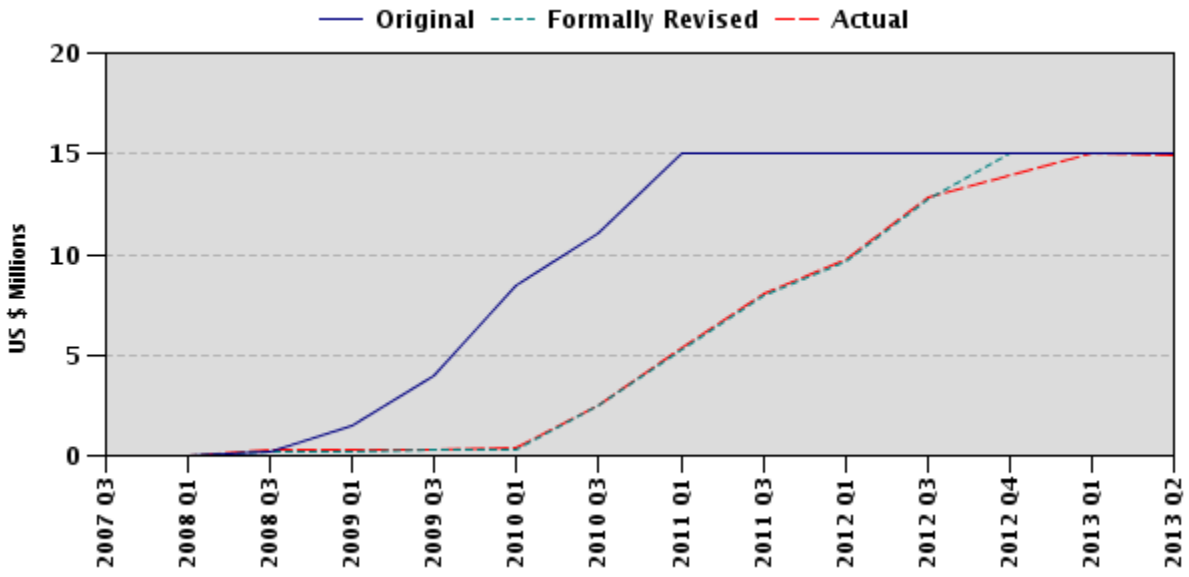
No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	06/28/2007	Satisfactory	Satisfactory	0.00
2	12/05/2007	Moderately Satisfactory	Moderately Satisfactory	0.00

3	06/29/2008	Moderately Satisfactory	Moderately Satisfactory	0.26
4	12/30/2008	Satisfactory	Moderately Satisfactory	0.29
5	06/15/2009	Satisfactory	Satisfactory	0.33
6	11/25/2009	Moderately Satisfactory	Moderately Satisfactory	2.46
7	05/11/2010	Moderately Satisfactory	Satisfactory	2.49
8	01/19/2011	Satisfactory	Satisfactory	7.11
9	12/20/2011	Moderately Satisfactory	Moderately Satisfactory	10.69
10	04/15/2012	Moderately Satisfactory	Moderately Satisfactory	12.80

H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
02/12/2010	N	MS	MS	2.47	Extension of closing date due to implementing delays caused by political and security issues.
11/07/2011	N	S	S	10.27	Extension of closing date due to implementing delays caused by political and security issues.

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1. Lebanon has long suffered from serious challenges in the provision of potable water, including gaps in distributional equity across regions, poor quality and intermittent supply. Among the regions recognized for poor water quality and intermittent supply of water was the West Beka'a Valley, a region also suffering from pockets of extreme poverty and economic hardship. In 2007, the average access rate for network water supply was at 68%, considerably lower than all other regions in the country. Furthermore, those with access were being provided with water that studies showed met neither World Health Organization (WHO) nor Lebanese drinking water standards. These environmental challenges compounded the economic and social hardships faced by residents in this area where a substantial number of residents were reported to live below the extreme poverty line and illiteracy was as high as 35%.

2. In the late 1990s, the Government of Lebanon (GoL) developed a two-track approach to addressing water and sanitation challenges both nationally and in the Beka'a specifically. The World Bank assisted with both tracks and provided technical assistance support to the Ministry of Energy and Water (MOEW) for the design and implementation of critical sector reforms. The World Bank further financed: (i) the 1993 Emergency Reconstruction and Rehabilitation Project (ERRP) which supported Lebanon's massive post-war reconstruction and rehabilitation efforts, (ii) the 2002 Ba'albeck Water and Wastewater Project (BWWP) to improve urban water and sanitation services in the Beka'a area and; (iii) the 2006 West Beka'a Emergency Water Supply Project.

3. GoL's first track focused on institutional change. In 2000, Parliament passed a new water sector law (Water Law 221) designed to improve efficiency in service provision, in part through consolidating many small utilities into Regional Water Authorities (RWAs). In the Beka'a, the Beka'a Regional Water Authority (BRWA) was formed in 2001 to take on the role of service provision for some 572,000 people, absorbing 3 utilities plus smaller regional water boards. BRWA inherited distribution networks that were in poor physical condition, with very high numbers of illegal connections and very low tariff collection rates from those who were legally connected.

4. The second track was to channel investment resources to the sector, particularly to the historically underserved areas. Against the background of BRWA's weak institutional capacity and slow progress in improving underlying service conditions, the 2006 Lebanon war proved a particularly major setback to the Beka'a region's already poor water infrastructure conditions.

5. In the aftermath of hostilities, resources available through the Bank Trust Fund for Lebanon, in support of recovery and reconstruction efforts, therefore supported a Grant for reconstruction of the water supply system in West Beka'a. An assessment of the economic and social impact of the hostilities and an analysis of the macro and structural priories for the future were carried out in preparation for this program. This

included extensive consultations with government, private sector and other stakeholders as well as partnerships with multiple donors. The broader program in West Beka'a has also benefited from support from the Kuwait Fund for Arab Economic Development (KFAED).

1.2 Main Beneficiaries

6. The project was implemented in a region of Lebanon known to have among the lowest income levels in the country. In 2009, a World Bank Social Impact Analysis (Report No. 48993-LB) of the water and electricity sectors in Lebanon showed that in the Beka'a Valley, 10 percent of the population lived below the extreme poverty line. This compared to an overall country average of less than one percent in extreme poverty, and was matched by disparities in service provision across regions.

7. While the project was not designed to have a direct impact on poverty reduction, it did aim to improve health outcomes by providing near universal access to clean water. The project achieved significant cost savings which allowed the distribution network to be directly extended to over 16,000 additional beneficiaries as compared to the targeted beneficiaries at project design. Over 84,810 people have thus benefited from the project through the provision of improved access to water supply services, which has an indirect but significant impact on the poor.

1.3 Original Objectives and Key Indicators

8. The key development objective was to "alleviate the precarious conditions of the area's water supply systems, which had been further aggravated by recent hostilities and long-term neglect". More specifically, the project was expected to improve health conditions of the population of the West Beka'a through the provision of non-contaminated water in increased quantities by completely rehabilitating the area's water network.

9. To this effect, the World Bank proposed to focus on three main project development outcomes to improve the health of population within the project area: (i) quality of water supplied (WHO standards met); (ii) quantity of water supplied; and (iii) the number of households legally connected to the water supply network.

10. Intermediate outcome (IO) indicators included: (i) implementation progress is satisfactory and works contracts awarded without delays; (ii) number of meters installed; and (iii) number of km of network rehabilitated.

11. Project outcomes were supported through two key components:

- ***Component I: Construction of water networks and facilities (13.75 million USD):*** The first component focused on rehabilitation and expansion of water production, storage, transmission and distribution systems in the villages of Er Raouda, Bar Elias, El Marj, Haouche el Harime and El Khiara.

- ***Component II: Technical assistance (1.25 million USD):*** The second component was designed to ensure effective implementation of the project through four activities: consulting services for construction supervision, consulting services for implementation of the Environmental Management Plan (EMP), a technical audit under Component I and support to the Project Management Team (PMT) responsible for implementation of the project.

1.4 Revised PDO and Key Indicators

12. The PDO and indicators have remained the same throughout the project lifespan.

1.5 Other Significant Changes

13. **Extension of Grant Closing Dates:** The project became effective on August 2, 2007, three months after Board approval. Due to political tensions and security concerns, works under Component I started only on August 28, 2009 with an expected timeframe of 24 months. Therefore, a request to extend the closing date from May 20, 2010 to November 20, 2011 was made and approved in February 2010. Once the contracts were awarded, construction and supervision proceeded on schedule.

14. Although physical implementation proceeded with no major bottlenecks, a major institutional issue – that of subscriptions to the upgraded service – arose as the new distribution system was laid. Households accustomed to service without formal connections or to formal connections without payment, were slow to accept the utility imperative of moving to service on a self-sustaining commercial basis. The Bank responded by identifying additional Public Private Infrastructure Advisory Facility (PPIAF) Grant funds to support BRWA's subscription efforts and granted an additional six-month extension to give the BRWA more time to increase subscription levels, leading to a final closing date of May 20, 2012.

15. **Increased scope of work and service area:** At appraisal, the client expected that available funds would support the rehabilitation of 29 km of transmission lines and 80 km of distribution lines. A combination of modest redesign and significant procurement efficiencies allowed the rehabilitation or replacement of 20 km of transmission and 174 km of distribution lines, extending the potential number of subscribers from the 13,600 households estimated at appraisal to nearly 17,000 households at project close.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

16. **Link with National Investment Program for the Water and Wastewater Sector:** This project was an element of Lebanon's national investment program prepared by the Council for Development and Reconstruction (CDR) for implementation between 2006 and 2010. The program was designed to rehabilitate and expand water and wastewater infrastructure, and improve operation and maintenance of facilities as well as

the overall institutional framework of the sector. The West Beka'a was a priority area for investment under this program.

17. **Project Preparation and Design:** The project team drew lessons from the 2006 mid-term review of the Ba'albeck Water and Wastewater Project (BWWP - P074042), which was under implementation in another BRWA service area. In particular, to avoid implementation delays, the Bank team recommended the use of a single works contract evaluated through a simplified CDR approval process. Additionally, because the BWWP already supported BRWA's institutional development and given the emergency nature of the project, the Bank team determined that the West Beka'a project should not include an institutional capacity building component.

18. Bank appraisal team members were on-going contributors to the national water sector policy dialogue in Lebanon (including most recently with the development of the MOEW's 2012 National Water Sector Strategy). The West Beka'a PAD thus documented, in Annex 2, the broad array of national level water sector initiatives that, when implemented, would provide the enabling environment needed by BRWA to significantly improve its technical and financial performance, including the realization of the PDO target of 90% legal connections to the new infrastructure.

19. Despite a history that suggested otherwise, the Bank's appraisal of the West Beka'a project assumed that once connections were available, households would subscribe. This judgment was made in the face of the 2006 BWWP midterm review that documented the failure of BRWA to make any institutional progress (including in subscriptions) over the first four years of the BWWP. The West Beka'a appraisal team was so confident of their midterm review prescription for BWWP success that the West Beka'a PAD did not even mention institutional development as a risk factor.

20. The sustainability of the investments made under the West Beka'a project was likewise wholly dependent on the financial strength and technical and managerial capabilities of BRWA. The Bank appraisal team was correct that the West Beka'a project itself did not need an institutional development component, given the efforts aimed at the BRWA already supported through other projects. However, the West Beka'a project's failure to meet its key development objective was inextricably linked to the failure of the BRWA institutional development program. The West Beka'a team did not include that effort as a risk element of the West Beka'a project despite their recognition of BRWA's weaknesses in the BWWP midterm review. For this reason, the quality at entry is deemed moderately unsatisfactory.

21. BRWA's performance is analyzed in detail in the forthcoming ICR for BWWP, but in summary, Lebanon's inability to make significant progress in water sector institutional reform severely affected BRWA, both in its staffing and financing. The national government appoints each Regional Water Authority Director General (DG), but failed to appoint a full-time DG for BRWA until late 2009. The resulting eight-year leadership gap slowed institutional reform. While the 2009 appointment finally led to badly needed leadership improvements, the DG did not receive authorization to recruit

professional staff until 2012 and, at project close, recruitment was still under way, leaving the BRWA much weaker than anticipated at appraisal. Other critical national policy changes, such as that of moving RWA customers to volumetric tariffs (hence making meters a useful element of the system) were piloted in other parts of Lebanon but not implemented nationally. BRWA's push to legalize connections, establish a culture of payment, and cut off non-payers also does not have strong political support, a fact not lost on BRWA customers.

22. Compounding these institutional bottlenecks, the appraisal team underestimated the influence that local politics might play in household decision-making. The region, historically known as a factional stronghold, is one of the most politically and socially complex in the country. While the challenges of conducting development operations at the local level is well known, social risks associated with the project were not flagged and therefore preemptive action to mitigate such costs was absent.

23. Because of the risk of household failure to legally connect was ignored at appraisal, it became apparent only once the new system was operating, leaving BRWA scrambling to develop a response (with strong support from the new Bank implementation support team) only very late in the project's life. The appraisal failure to perceive any risk to this key element of project performance renders this element of quality at entry unsatisfactory. The success of the design and procurement approaches to the physical works only partially offset that evaluation and overall quality at entry is rated moderately unsatisfactory.

24. One risk that was highlighted by the preparation team (that of political and security risks) did become a factor that significantly slowed implementation. The Lebanese war of 2006 that triggered this project resulted in an internal, two-year political stand-off that delayed project implementation. Once the situation eased in 2008, the awarding of the works contract followed by physical implementation proceeded on schedule.

25. **Quality of Entry:** There was no formal review carried out by the Quality Assurance Group. This ICR review concludes that Quality of Entry was Moderately Unsatisfactory.

2.2 Monitoring and Evaluation (M&E)

26. The Government monitored progress through quarterly reports submitted by the Project Management Team (PMT) at CDR to the World Bank, the MOEW, CDR's executive management and the BRWA. Monitoring focused on engineering outcomes during early implementation. Monitoring of on the number of new connections was added as the rehabilitated system became operational. The M&E design did not include monitoring of health or poverty outcomes.

27. The monitoring program provided timely coverage of progress with civil works and, in 2010, revealed that while infrastructure improvements were on track, the

proportion of household connections remained low. This was principally due to the pervasive issue of non-payment and legal enforcement by Beka'a residents and the BRWA respectively.

28. A 2011 public awareness campaign organized by BRWA and the PMT, with the support of the Bank supervision team, was launched in the West Beka'a to introduce subscription discounts complemented by a free household connection service (Annex 6: List of Supporting Documents). These measures led to a significant increase in subscription rates. Between October 2011 and May 2012, subscription rates across West Beka'a localities increased by 59 percent. This was considerably higher than the previous annual subscription growth rate of less than 10 percent. While increasing from a subscription base still low relative to that required for the utility's economic viability, the success led BRWA to continue, after project close, a strategic communications and outreach effort across communities in the Beka'a Valley.

29. In March 2012, the BRWA carried out a region-wide survey of 800 households with the support of the PPIAF Grant to better identify community needs and approaches that would increase subscription levels (Annex 6: List of Supporting Documents). The BRWA has already drawn from the survey results to better address specific concerns with water operations in select neighborhoods.

30. Though the BRWA's recent measures to increase subscriptions are promising, success at achieving the goal of 90 percent connections will require the BRWA to shut off water through the old network still used, at no cost, by most households. This decision is not in BRWA's hands, but must be made at the political level.

Post Completion and Next Steps

31. Building institutional sustainability is an ongoing process that requires time and strong leadership. Institutional growth is further inevitably impacted by the socio-political context surrounding it. In a region such as the Beka'a Valley, the political nature of how local development unfolds is complex and unpredictable, calling for project teams to be more realistic about feasibility of objectives and timeframe. In the case of this project, the physical works were successfully completed but the risks associated with consumer behavior were underestimated and proved to be an obstacle for overall success in the lifespan of the project.

32. Shortly after his appointment, the Director General of the BRWA set in place a strategy to increase subscriptions through enhanced outreach and partnership development. The Director General also played a lead role in lobbying the MOEW for the 20 billion Lebanese Pounds (LBP) which have been transferred to support operation and maintenance costs post the closing of the World Bank projects in West Bekaa and Ba'albeck.

33. Had the Director General been appointed at an earlier stage of the BRWA formation, the institutional process would have started years ago and likely resulted in a

more positive outcome. Nonetheless and, as noted earlier, the ICR team views the measures undertaken by BRWA as promising and, in time, achievable with government support and appropriate reforms in place.

2.3 Safeguard and Fiduciary Compliance

34. There were no reported divergences or waivers from the Bank's safeguards and procedures during implementation. As required, CDR prepared quarterly reports to the World Bank and Bank teams supervised these aspects of project implementation.

35. **Environment:** The project was categorized as Category B, consistent with World Bank Operational Policy 4.01, and any adverse environmental impacts caused by Component I investments were expected to be temporary and minimal. No significant impacts were reported or noted by the client or Bank supervision teams during or post construction.

36. **Social:** It was expected that the project would "require a modest acquisition of land" under Component I and as such triggered the Bank's safeguard policy OP 4.12 on Involuntary Resettlement. At the time of the design of the Technical Annex, the details for the construction sites had not been identified. Therefore, a Resettlement Policy Framework (see Annex 6 – List of Supporting Documents) was prepared by CDR to set guidelines for assessing construction on private/public land plots and, where needed, put in place a plan for compensation. Records presented by CDR during the ICR Mission dated (April 24-28, 2012) indicate all construction under Component I took place on public land, therefore no land acquisition was necessary.

37. **Financial Management:** As stated in the PAD, a financial management capability already existing within CDR would be responsible for maintaining records and reporting to the Bank. Supervision teams reviewing internal approval documents indicate an experienced Financial Officer has been adequately implementing the financial management arrangements[1]. There have been no reported FM issues.

38. **Disbursements:** The estimated project cost during appraisal was 15 million USD. Actual project cost was 14.98 million USD which were fully disbursed within the grace period following the grant closing date (See Annex 2).[2] All disbursement requests were appropriately documented and the Bank response was timely.

39. **Procurement:** CDR prepared a procurement plan as of February 16, 2007, included in the PAD as Annex 4. The PMT was responsible for all implementation arrangements related to Bank-financed procurement. Due to the political situation and as described above, there was a two-year implementation delay, with the works contract signed only on July 7, 2009. Since the commencement of works on August 28, 2009,

[1] Samples from Baalbeck Water and Wastewater Project and West Beka'a Emergency Water Supply Project Supervision Mission Aide Memoire, August 26 – September 8, 2008 and June 6-10, 2011 -- (Page 9 and Annex 1 – Financial Management Review, respectively).
[2] There is a four month grace period where committed funds can be disbursed. The deadline for West Beka'a was September 20, 2012.

there were no reported issues with compliance of Bank procedures and procurement proceeded on schedule.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation
Rating: Moderately Unsatisfactory

40. The project was directly linked to long-term and still relevant, government reform efforts and addressed important issues highly relevant to improving water and wastewater services across Lebanon. The project is referenced in the 2007 Interim Strategy Note (Pillar 3: Resource and Environmental Management which was designed to contribute to the outcomes of improved water management, land use management and air pollution control), and most recently in the 2011-2016 Country Partnership Strategy (CPS) (Tier I – Core Program in which the project was reflected as a project under implementation). Improved water and sanitation remain a high priority for GoL as witnessed by their inclusion in the Council of Ministers' December 2011 Economic and Social Reform Action Plan reform pillar on Infrastructure Rehabilitation as well as the March 2012 formal adoption of the National Water Sector Strategy, as set out by the MoEW which proposes a detailed plan for improved water, sanitation and irrigation services and reforms nationwide.

41. In addition, the project contributed directly to the Government Investment Program in the Western Beka'a, with objectives, design and implementation focusing specifically on rehabilitation to improve quality and quantity of water supplied to a population with some of the lowest socio-economic indicator levels in the country. Its focus on increasing the number of legally connected households in order to ensure self-financing for the BRWA was well placed, but it lacked the analysis needed to understand whether this was a realizable goal. Furthermore, project design shortcomings left the project vulnerable to unacknowledged risks that were well known in the sector at the time of appraisal as described above.

42. Finally, the stated objective of the project was to improve health conditions of the population through the provision of non-contaminated water in increased quantities by completely rehabilitating the water network. The appraisal states that "more specifically, the project is expected to improve health conditions of the population of the West Beka'a" (PAD, para 23). However, the team did not document the state of network water-related health issues in the area at appraisal and made no provision to follow up on this issue during implementation. The two-year implementation delay did not appear to impact health in the area. The PDO would thus more appropriately have either not raised the health issue or would have made an effort to document it.

3.2 Achievement of Project Development Objective
Rating: Moderately Unsatisfactory

43. The achievement of the PDO is evaluated below, with detailed analysis of the indicators used by the team to measure overall PDO outcome:

44. **Development Objective: Improve health conditions of the population of the West Beka'a through the provision of non-contaminated water in increased quantities by completely rehabilitating the area's water network**. PDO achievement is rated moderately unsatisfactory.

45. The PDO focused on correcting the unsafe conditions found in the water supply and reducing the consequent health risks to residents. The PAD proposed three indicators to evaluate the outcome: (i) quality of water supplied (WHO standards met); (ii) quantity of water supplied; and (iii) number of households legally connected to the water supply network.

46. It is important to note that although adequate quantities of high quality water play an important role in maintaining health, the determinants of health outcomes go beyond the measures proposed. These indicators alone are not sufficient to make a statement about health outcomes. Since both the preparation team and the ICR team lacked access to the information needed to relate health outcomes to water project outcomes, this analysis will present the outcomes of indicators: (i) quality, (ii) quantity, and (iii) number of households legally connected without attempting to link them to local health outcomes.

47. **Quality:** Expected improvements in the quality of water supplied (WHO standards met) were met under this project. In 2007, the water supplied to residents in West Beka'a failed to meet WHO or Lebanese drinking water standards. The rehabilitation of the Chamsine Spring and the new distribution network under Component I were expected to ensure that the population would be provided with good quality water. As such, Grant resources complemented other funds to facilitate a testing regime that tracks the output of the source wells, the effectiveness of the chlorination facilities, and the quality of water delivered to households via rehabilitated networks.

48. The water testing protocols have been observed and monthly reports aggregate test results. The ICR team reviewed a sample of these reports, which confirm that the project water supply has consistently achieved WHO drinking water quality standards with the exception of some instances where residual chlorine was not found. In contrast to the experience at entry, when nitrates were at 100 mg/l and fecal coliforms at 10/100 ml, after project implementation nitrates have been below 1.5 mg/l and fecal coliforms typically measured at 0/100 ml. This performance easily meets the PAD targets of nitrates below 10 mg/l and fecal coliforms below 1/100 ml. The testing regime includes measurement of residual chlorine with mixed results indicating that more attention is needed to ensure sufficient free chlorine is available throughout the network (especially at end-of-pipe).

49. **Quantity:** Levels of potable water supplied to commercial establishments and households meet original target objectives. The increase in available water from 60 liters per capita per day (l/c/d) to well above 100 l/c/d promises to raise the benefits of water

use enjoyed by households. The upgraded water supply system produces sufficient water to meet the output goals under the project.

50. **Legal Connections:** The proportion of households legally connected falls far short of the goal of 90 percent. According to utility records, 5,310 households (or 32 percent of total current households), are connected to the upgraded system (see Table 1). Given that the utility now has much better control of the network than they did at appraisal, illegal connection numbers for the new network are very low. However, at closing, the project delivered safe potable water to just over one third of total households largely due to the BRWA's policy of only providing water to those households that had legally connected to the network.

51. As discussed below, the ICR team believes that the utility has made the right long-term decision by withholding connections to non-subscribers; however, when assessing achievement of the PDO, the outcome at closing must be judged moderately unsatisfactory.

Table 1. West Beka'a Subscriptions and Improved Network Beneficiaries:

Locality	Households at entry	Current households	31/12/10	30/09/11	30/11/11	31/12/11	10/5/12*
Bar Elias	7,024	9,252	1,983	2,051	2,182	2,615	N/A
Hauch el Harime	1,728	1,400	205	259	266	293	N/A
Khiara	436	437	91	132	136	138	N/A
Marj	3,920	5,353	684	693	819	1063	N/A
Rauda	481	520	182	207	231	246	N/A
Total WB:	13,589	16,962	3,145	3,342	3,634	4,355	5310
*Final figure reflects subscription applications being processed during the final months prior to project closing.							

52. **Connection policy:** During the early implementation of BWWP, the BRWA had a policy of connecting all potential users, whether or not they immediately subscribed to the upgraded service. The rationale behind this policy, and that adopted in the West Beka'a project design, was that the demonstrated benefits of the service would lead users to subscribe. In practice, the policy was unsuccessful for multiple reasons. A long history of poor service provision across the region, combined with a lack of enforcement due to BRWA's weak institutional capacity, created little incentive for households to subscribe. Additionally, people saw few reasons to move to paying status if they already received high quality water without paying. A detailed discussion of the Ba'albeck experience with this policy is provided in the forthcoming Ba'albeck Water and Sanitation Project ICR.

53. Disconnection of non-subscribers has been difficult, so BRWA modified its connection policy in 2010 so that connections are made available only to households that first subscribe. In the West Beka'a service area, rehabilitation came on-line only after the

new policy was in place. Households with alternative sources of water have been slow to subscribe, creating the gap between appraisal estimates and the project outcome. Within BRWA as a whole, the subscription rate is estimated at 41 percent, which is above the West Beka'a level. Contributing to this relatively low subscription rate has been BRWA's practice of continuing to supply water through the old, low-pressure West Beka'a distribution system – a choice necessitated by the political unacceptability of immediate, full cut-off.

54. BRWA has an active, Bank-supported subscription program that has enabled it to add 2,000 new subscribers over the 12 months through May 20, 2012. Based on this experience and subsequent plans to reduce flows into the old distribution network, BRWA has reason to expect that in the medium-term a very high percentage of the nearly 17,000 households now residing in the West Beka'a service area will be serviced through subscriptions.

55. It is clear that the implementation of the project is an ongoing process that – due to aforementioned challenges – will require additional time to meet the overall outcome of 90% of beneficiaries choosing to access the water made available by project outputs. With the improved network available, it is a matter of time before BRWA continues to cement its record of credibility among its community members and improves the connection rate.

3.2.1 Outputs by components

56. The achievement of the two components is summarized below:

57. **Component 1: Construction of Water Networks and Facilities.** This component is rated satisfactory.

58. At project closing, all transmission and distribution pipelines were either rehabilitated or newly constructed, for a pipeline total of 197 km. The production wells were relocated, deepened, and better protected from outside influence. New water storage tanks were constructed to ensure better continuity of supply and to lower operating costs. Approximately 174 km of distribution pipes (polyethylene [PE] and ductile iron [DI] ranging from 25mm to 300 mm) were laid in the villages of Bar Elias, El-Marj, Er-Raouda, Haouch El Harime, and Khiara, while 20 km of new transmission pipelines (DI ranging from 125-600 mm in diameter) were run from the storage tanks and 3.5 km of line (DI-500 mm) was laid from the pumping station to the storage tanks. Modifications during construction were made to increase distribution lines, allowing future connections to 17,000 households from the appraisal estimate of 13,600.

Table 2: Localities of Distribution Networks

Localities	Total Polyethylene Pipes (PE)	Total Ductile Iron (DI)	Total DI and PE
Bar Elias	60,398	21,064	81,462
El-Marj	39,908	9,630	49,538
Er-Raouda	6,874	2,933	9,807
Haouch El Harime	19,112	5,979	25,091
Khiara	7,261	554	7,815
Total	133,553	40,160	173,713

59. Extensive improvements in the Chamsine spring catchment were carried out including four new pumps, and two storage reservoirs with a total capacity of 7,000 m^3. Modifications in terms of number of wells, pumping stations and reservoirs were made during the construction phase based on need and current design to meet objectives. Table 3 presents outcomes of works in more detail.

Table 3. Outcome of Works: Construction and Rehabilitation

Rehabilitation of existing Chamsine Pumping Station (Zone 1- Western Bekaa)	✓ Installation of 4 New Pumps ✓ Installation of Chlorination System ✓ Reinstallation of Surge Tank ✓ Rehabilitation of the Pumps Area ✓ Chlorination Rooms ✓ Guard House ✓ Upgraded Laboratory Room ✓ New small sewage treatment lant for the guard room ✓ Improved Lighting, Window System, and Tiling
Kefraya Well Station	✓ Installation of New Submersible Pump, 10", 72m3/hr, h=300m
Rmasa Well Station	✓ Increasing Well Depth from 512m to 620m ✓ Replacement of the Submersible Pump, 6", 12m^3/hr, h=620m
Strategic Reservoirs	✓ Two circular reinforced with a total capacity of 7000m^3 (2x3,500m^3) ✓ New pipe connections, accessories and valves chambers, retaining walls, steel gate and fence.
Elevated Reservoirs	✓ Rehabilitation of 2 existing elevated reservoirs: 300 m^3 each, at al-Rawda and al-Khiyara

60. **Component 2*:* Technical Assistance.** This component is rated as satisfactory**.** The sub-components are evaluated below:

- Consulting services for construction supervision were completed with no demonstrable challenges and physical outputs met contract standards.
- Consulting services were acquired for implementation of the Environmental Management Plan (EMP) which established the needed protocols and training to upgrade laboratory work and resulted in the needed frequency and quality of testing, supported by detailed record keeping.
- Support to the PMT was provided by CDR staff on a regular basis. As a result, the PMT was effective in ensuring that implementation stayed on track and was active in supporting the BRWA in implementing outreach materials to increase subscriptions and improve communications with clients.
- There were no outstanding audits at project grant closing.

3.3. Efficiency
Rating: Unsatisfactory

3.3.1 Net Present Value/Economic Rate of Return

61. The economic rate of return was not estimated at appraisal due to the emergency nature of the project, time constraints and limited availability of data. The PAD does, however, offer a qualitative assessment of the economics: "*the project will bring significant public health and socio-economic benefits through better quality and availability of water, improvements in the sustainability of water sources by reducing losses and wastage, as well as through the reduction of the cost of water supply for low income families. Overall, the project is expected to improve the quality of life of the targeted population, leading to significant health and welfare benefits.*[3]" and "*Given the high positive externalities for this type of investment, the project is expected to be cost-effective.*[4]"

62. The fundamental economic question in evaluating project outcomes then becomes the number of people enjoying the use of the higher quality water, available at higher quantities. By this measure, at least in the short run, the project has not met its economic target with 5,310 connections at project close, compared to the 12,230 connections in the appraisal estimate for project close[5]. The economic cost of each connection at project close is thus more than twice that anticipated at appraisal. If the program can continue to add 2,000 households per year until they achieve 90% of the population, BRWA will have brought the net present value of the average economic investment cost per connection down to a level very close to the appraisal sum.

3.3.2 Financial Rate of Return

63. Similarly, the financial rate of return was not estimated at appraisal due to the rapid assessment required of this emergency project. Among subscribers across BRWA,

[3] As stated in the PAD, paragraph 62.
[4] As stated in the PAD, paragraph 63.
[5] The procurement efficiencies that allowed expansion of works well beyond the appraisal and additional local household growth rates during the two year delay led to a household count at close of 16,962 as opposed to the 13,600 appraisal estimate.

the tariff collection rate is rising, but in 2011 reached only one-third of billings. On that basis, the investment currently faces a negative financial rate of return, as BRWA itself must rely on national government subsidies to meet current operating costs and lacks the budget to maintain the investments at the desired level. As mentioned above, the BRWA has received a 20 billion LBP subsidy from the MOEW to finance ongoing operation and maintenance costs over the next two years.

Project Efficiency Rating

64. The positive physical investment efficiency (reflected in attaining network extension well beyond planned levels) is outweighed by the very low efficiency (as measured in terms of cost per subscriber). Despite the short term Government subsidy provided to BRWA, the lack of a long-run sustainable financing source to assure operations and maintenance at the level needed to protect the quality of the investment contributes to the "Unsatisfactory" efficiency rating.

3.4 Justification of Overall Outcome Rating
Rating: Moderately Unsatisfactory

65. The overall outcome was measured against the outputs of the project's two components and a combination of indicators, including (i) quality of water supplied (WHO standards met); (ii) quantity of water supplied; and (iii) the number of households legally connected to the water supply network. Intermediate outcome (IO) indicators included: (i) implementation progress; (ii) number of meters installed; and (iii) number of km of network rehabilitated.

66. The project succeeded in rehabilitating the network in West Beka'a, putting in place a production and distribution system at lower-than-expected unit costs that can assure sufficient clean water to 17,000 households in the service area, an increase of 3,400 households, or 20 percent, over appraisal estimates. Total investment costs matched the appraisal estimate.

67. Where the project falls short – and this the ICR team recognizes as no small gap – is the number of households actually benefiting from the improved and expanded network. As describe above, reasons for this ranged from weak institutional management, inadequate government reforms, and misplaced incentives for households to pay for water. The rating is thus moderately unsatisfactory when measured at project close. Nevertheless, the significant efforts made by BRWA to increase subscriptions as well as the intensified support by the World Bank and CDR in focusing on this critical step may provide the basis for a satisfactory outcome in the long run.

4. Assessment of Risk to Development Outcome
Rating: Substantial

68. **Institutional / Financial Risk:** Low collection rates continue to pose a real challenge to economic viability of the BRWA. Sustainability of BRWA, and

subsequently to the West Beka'a investments, is therefore dependent on external sources until subscription and collection levels increase. To date, the BRWA relies on financial support from CDR and the MOEW to fill the financing gaps created by subscription shortfalls and growing accounts receivable. Even with that support, operations and maintenance are not funded at levels that protect against renewed degradation of the system despite the efficiencies that come with engaging private sector operators through service and management contracts.

69. Nonetheless, recent data from BRWA reveal an increasing trend of revenues, due to higher subscription and collection rates (See Table 4). This results from a targeted outreach program and promotional discounts. Additionally, at the time of project closing, BRWA was developing a five-year business plan (2012-2016) that would help recover late fees, optimize records and help further increase subscriptions. The government has further authorized the hiring of needed professional staff and has subsidized revenue shortfalls so that minimum maintenance needs can be met.

70. To date, these measures are inadequate to sustain a self-financing BRWA. The risk to sustaining project outcomes thus remains high even while central government funding ensures continued water service levels.

Table 4: BRWA Service Area Collections (Jan - June: 2010, 2011, 2012)

Month	2010 Revenues	2011 Revenues	2012 Revenues
January	254,285,838	242,796,000	294,841,168
February	206,225,000	376,299,000	388,812,000
March	326,061,367	534,348,709	559,103,000
April	304,201,372	560,368,384	727,097,000
May	206,612,250	765,396,963	949,306,000
June	483,805,542	1,296,210,721	2,082,224,000
Total	1,881,191,369	3,775,419,777	5,001,382,168

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

Bank Performance in Ensuring Quality at Entry
Rating: Moderately Unsatisfactory

71. At the time of appraisal, the West Beka'a project team drew lessons from a 2006 mid-term review of the BWWP being implemented in another BRWA service area. In particular, attention was given to implementation delays in the contracting process by use of a single works contract evaluated through a simplified CDR approval process. The project team expected that the institutional capacity needs of the project would be met through on-going support to BRWA through BWWP, as well as dialogue at the national level. The project nonetheless suffered a two-year implementation delay due to political problems of the type highlighted in the risk section of the PAD. Moreover, the institutional development problems around legal connections to the network that were not

recognized as a significant risk have become the primary reason why the main project development objectives had not been realized by project closing.

Quality of Supervision
Rating: Moderately Satisfactory

72. Security concerns and a fragile political environment created unavoidable implementation delays early on. The BRWA Director General was further not appointed until 2009 during which time the Bank supervision team supported the implementing agency in creating a robust project management team that was in place and oversaw efficient implementation once the political impasse was resolved. The implementation delay did force extension of the closing date, which government was slow to request, forcing the Bank team to downgrade project performance until an extension was approved.

73. The supervision team focused their efforts on both physical implementation and the needed institutional reforms. By 2010, the BRWA and Bank supervision team recognized the critical need to put BRWA on a sound financial footing and supported its policy to withhold connections until consumers subscribed to the upgraded service.[6] This threatened the short run achievement of the project's PDO, but is key to long-term, sustainable achievement of that goal. The supervision team further aided BRWA in obtaining PPIAF support for a program to increase subscriptions and supported an additional six-month project extension to support that implementation (See Annex 6).

74. Although discussed in the text of the ISRs, the team did not downgrade the "Progress towards achievement of PDO" rating to signal to management that the connection goal in the PDO would not be met by project closing and as such, the quality of supervision is rated as moderately satisfactory.

Justification for Overall Bank Performance
Rating: Moderately Unsatisfactory

75. Based on an averaging of the aforementioned outcomes and the overall project outcome rating of moderately unsatisfactory, the Bank's overall performance is rated moderately unsatisfactory.

5.2 Borrower Performance

Implementing Agency or Agencies Performance
Rating: Moderately Satisfactory

76. The performance of the implementing agency is rated moderately satisfactory. Despite the implementation delays that were outside the control of the agency and the fact that the BRWA Director General was only appointed in 2009, CDR management

[6] Based on reporting from the West Beka'a Emergency Water Supply Project Supervision Mission Aide Memoire, October 6-8, 2010.

worked diligently to ensure that implementation would proceed on schedule once the external political obstacles were overcome. Additionally, CDR's support to BRWA during the launch of the communications campaign was critical in helping increase subscriptions prior to closing of the grant.

Government Performance
Rating: Moderately Unsatisfactory

77. The performance of the Borrower is moderately unsatisfactory. The economic and financial performance and sustainability of the project depended crucially on the series of national institutional reforms outlined in Annex 2 of the PAD. The failure to make or effectively implement the reforms, particularly those under the "Improve Sector Governance" in Annex 2, have so slowed BRWA's development such that it has been unable to sustainably meet the project objective of sustainably providing water to even half of the 12,000 households anticipated at appraisal.

Justification of Rating for Overall Borrower Performance
Rating: Moderately Unsatisfactory

78. Based on an averaging of the aforementioned outcomes and the overall project outcome rating, the Borrower's overall performance is rated moderately unsatisfactory.

6. Lessons Learned

79. The implementation of infrastructure projects with the potential to serve a relatively large population during a time of political and institutional transition is particularly complex. In a country like Lebanon, the outcome is only compounded – often times adversely -- by additional complexities brought on by weak public institutions, deeply rooted political tensions, and, in the case of this project, historical mistrust of government institutions by a large proportion of project beneficiaries. Key lessons learned identified by the ICR team are thus as follows:

80. ***Coherence between the PDO and the proposed activities is critical for project success.*** There was a clear disconnect between proposed PDO and the activities under the components, particularly on the issue of health outcomes. Activities targeting health aspects of the PDO should have been incorporated in the design stage of the project.

81. ***Emergency operations require particular additional attention to the design of the monitoring and evaluation framework.*** The short time typically allotted to the preparation of emergency operations in particular, coupled with a rapid preparation process requires further development of the monitoring and evaluation framework at the early stages of implementation. As similarly concluded in the ICR for the Lebanon First Municipal Infrastructure Project (TF57333), the M&E framework is a key element of the project design which should be detailed after the initial steps of implementation of emergency reconstruction projects.

82. ***Past institutional performance as a key measure for project outcome***. The history of performance in key institutional areas provide critical insight into likely project performance. Improvements in physical infrastructure and service delivery were not sufficient to induce a change in the culture of not subscribing or not paying. Potential subscribers were drawn from households long accustomed to poor quality service, creating a mistrust of the service provider's announced plans for a consistently high quality service. In the case of West Beka'a, the simplification of the project design was a double-edged sword. On the one hand it allowed for successful development of physical infrastructure to meet the needs of an expanding population, but on the other hand, underestimated the institutional disconnect with the population it serves and ultimately its impact on beneficiary access.

83. ***Supply does not create its own demand.*** A recent survey financed by the PPIAF carried out within the BRWA service area, demonstrates that despite enhancements in quantity and quality, consumers continue to purchase higher cost water even when access to high quality piped water has increased.[7] Long term awareness raising efforts, coupled with an in-depth understanding of the incentive structure governing household decision-making processes are thus critical to project design.

84. ***Strong and sustained leadership as an essential driver for institutional development***. The delayed appointment of a full-time BRWA Director General impacted its ability to respond to the urgent need for increasing subscription and collection levels. Once the leadership position was filled, a community response mechanism to address these gaps was put in place, albeit late in the project lifecycle. Institutional development thus requires an internal champion who is both empowered and competent to build consensus around solutions that can steer the institution toward success as seen by the promising results on the West Beka'a subscription program.

85. ***Financial sustainability is a key ingredient in strong institutions and cannot be ignored.*** A solid understanding of the water supply and sanitation ecosystem and how it can be financially sustained is detrimental for sustainability of related infrastructure projects and achievement of development outcomes. For the Beka'a emergency project, the physical works and technical assistance components were satisfactory but expected outcomes of beneficiary access were below the targeted rate of 90 percent raising legitimate concerns on the long-term viability of the BRWA. Lessons can be drawn from the experience, however, especially when designing similar emergency efforts.

7. Comments on Issues Raised by the Borrower/Implementing Agencies/ Partners

86. In its letter dated 5710/1 dated November 5, 2012 (Annex 5), CDR provided comments on the draft ICR submitted by the Bank team. All comments have been incorporated into the final text.

[7] A summary of the PPIAF survey analysis is included as part of Annex 6: List of Supporting Documents.

Annex 1: Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Claire Kfouri	Sr Water & Sanitation Spec.	MNSWA	Task Team Leader
Sepehr Fotovat Ahmadi	Senior Procurement Specialist	MNAPR	Procurement Support
Rima Abdul-Amir Koteiche	Sr Financial Management Specialist	MNAFM	Financial Management Support
Rock Jabbour	Financial Management Analyst	MNAFM	Financial Management
Mona El-Chami	Sr Financial Management Specialist	MNAFM	Financial Management
Parameswaran Iyer	Lead Water & Sanitation Spec.	MNSWA	Water Sector
Mouna Couzi	Operations Analyst	MNCLB	Operational Support
Zakia Chummun	Language Program Assistant	MNSWA	Administrative Support
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ICR			
Samantha Constant	Consultant	MNSWA	Primary Author
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(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY07	25.96	133,515.94
FY08	8.58	70,040.31
FY09	5.7	37,853.19
FY10	8.35	46,479.27
FY11	4.85	26473.02
FY12	13.28	76116.15
FY13	-	-313.95
Total:	66.72	390,163.93

Annex 2. Project Costs and Financing

Components	Appraisal Estimate (US$)	Actual/Latest Estimate (US$)	Percentage of Appraisal (%)
Component 1: Construction of Water Networks and Facilities	13,750,000	13,889,953.80	101.02
Component 2: Technical Assistance	800,000	598,806.20	74.85
Contingencies	450,000	511,240.00	113.61
Total Financing Required:	**15,000,000**	**15,000,000**	**100**

Source of Funds	Type of	Appraisal Estimate	Actual	Percentage of Appraisal (%)
Borrower	Grant	12,000	13,212	110.10
IBRD	Grant	15,000,000	15,000,000	100

Annex 3. Outputs by Component

Component One: Construction of Water Networks and Facilities. The following outputs were produced under this component:

Chamsine Pumping Station

Electromechanical works for pumping station buildings included installation of four new pumps *(206m 3/hr,* H= 19 bars), electrical and control boards and cables, as well as pipes fittings and accessories (water meter, motorized gate valves, check valves, air release valves). The removal and reinstallation of existing pumps also took place along with the removal, rehabilitation and reinstallation of the surge tank and replacement of the existing chlorination equipment with a new system.

Civil works covered rehabilitation of all the existing buildings, including pumps area, chlorination rooms, guardhouse, and laboratory room. This covered new waterproofing for top slabs, painting inside and outside buildings, new tilling, concrete tiling in the pumps area and outside building, new roof drainage systems, new steel and wood doors, new steel gate and fence, windows and lighting rehabilitation, new complete mechanical/sanitary system for laboratory room and new Waste Water treatment plant for the guard house.

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Kefraya and Rmasa Well Stations

Additional civil works covered the Kefraya and Rmasa well stations. The submersible pump for each station was replaced with specifications that fit according to the capacity of each well. An increase in well depth was required for the Rmasa well and this was adjusted with the needed equipment.

Strategic Reservoirs

Two circular reinforced concrete reservoirs were built having a total capacity of 7000m^3 (2 x3500 m^3) including pipe connections, accessories and valves chambers, retaining walls, steel gate and fence. An access road of approximately 1.1 km long and 5-6m wide was constructed around the base of the reservoirs.

Pipelines

Pumping lines consisted of ductile iron pipes 500 mm in diameter with a length of 3.5 km, and 3.5 km of polyethylene pipe 63 mm in diameter for telemetry cable. Transmission network consisted of ductile iron ranging from 125-600 mm in diameter with a length of 20 km. Distribution networks consisted of polyethylene pipes ranging from 25-90 mm in diameter with a length of 134 km and ductile iron pipes ranging from100-300mm with a length of 40 km. Full pipe quantities across locations are provided in the following table:

Pipe Type and Diameter	Pumping Line	Transmission Network	Distribution Networks						Total Pipes
			Bar Elias	El-Marj	Er-Raouda	Haouch El-Harime	Khiara	Total Distribution	
PEOD 25	0	0	241	0	0	0	0	241	241
PEOD 32	0	0	4,436	158	628	3,934	1,521	10,677	10,677
PEOD 40	0	0	16,453	4,897	242	3,842	1,324	26,758	26,758
PEOD 50	0	0	16,231	15,910	1,391	2,639	1,435	37,605	37,605
PEOD 63	0	0	10,533	9,991	3,813	2,896	1,884	29,117	29,117
PEOD 75	0	0	5,226	188	0	1,873	398	7,684	7,684
PEOD 90	0	0	7,278	8,765	800	3,929	700	21,472	21,472
Total PE	0	0	60,398	39,908	6,874	19,112	7,261	133,553	133,553
DI 100	0	0	6,587	4,480	780	2,105	554	14,505	14,505
DI 125	0	4,330	4,775	565	0	1,715	0	7,055	11,385
DI 150	0	0	5,101	670	901	1,944	0	8,616	8,616
DI 200	0	1,004	3,851	2,708	1,252	216	0	8,026	9,030
DI 250	0	6,600	611	1,207	0	0	0	1,818	8,418
DI 300	0	1,330	140	0	0	0	0	140	1,470
DI 400	0	1,265	0	0	0	0	0	0	1,265
DI 500	3,512	0	0	0	0	0	0	0	3,512
DI 600	0	5,526	0	0	0	0	0	0	5,526
Total DI	3,512	20,055	21,064	9,630	2,933	5,979	554	40,160	63,727
Total	3,512	20,055	81,461	49,538	9,807	25,091	7,815	173,712	197,279

Source: Project Management Team (PMT) at Council for Development and Reconstruction, April 2012.

Component 2: Technical Assistance. The outputs for this component are highlighted in the main text. Primarily, technical assistance focused on consulting services for construction supervision and implementation of the Environmental Management Plan (EMP). Needed technical support for auditing was also included as an output.

As such there were no demonstrable challenges in construction supervision and physical outputs met contract standards. The EMP established the need protocols and training to upgrade laboratory work. The team reviewed a sample of laboratory records which provide detailed information about the frequency and quality of testing.

Finally, Bank reporting during supervision missions shows that adequate auditing arrangements were in place with no outstanding audits at project grant closing.

Annex 4. Economic and Financial Justification

The Technical Annex for the Grant supporting the West Beka'a Emergency Water Supply Project investment (dated March 19, 2007) includes neither a quantified financial nor an economics analysis, due to the rapid preparation needed for this emergency project. It does, however, offer a qualitative assessment of the economics: "The project will bring significant public health and socio-economic benefits through better quality and availability of water, improvements in the sustainability of water sources by reducing losses and wastage, as well as through the reduction of the cost of water supply for low income families. Overall, the project is expected to improve the quality of life of the targeted population, leading to significant health and welfare benefits." (para 62) and "Given the high positive externalities for this type of investment, the project is expected to be cost-effective." (para 63).

The PDO focused on health benefits and the proposed measures were three: (i) quality of water supplied (WHO standards met); (ii) quantity of water supplied; and (iii) increase in number of households legally connected to the water supply network. The ICR economic analysis relies on the team's chosen outcome measures. However, it is worth noting that sub-component iii is not a measure of likely health outcomes (which depends purely on whether households have switched to the higher quality water supply, not how they gain access), but instead a sustainability indicator, since it signals the ability of the utility to manage the network and, potentially, collect adequate revenue to meet maintenance and rehabilitation needs.

Health Benefits

Although adequate quantities of high quality water play an important role in maintaining health, the determinants of health outcomes go far beyond those two elements and it has long been known that these indicators alone are far from sufficient to make a statement about health outcomes. Both the preparation team and the ICR team lack access to the information needed to relate health outcomes to water outcomes. This analysis will therefore look at the two indicators of quality and quantity without attempting to link them to local health outcomes.

Water Quality

Grant resources complemented other funds to facilitate a water quality testing regime that tracks the output of the source wells, the effectiveness of the chlorination facilities, and, through end-of-pipe testing, the quality of water delivered to households. The water testing protocols have been observed and monthly reports aggregate test results. The ICR team reviewed a sample of these reports, which confirm that the project water supply has consistently achieved WHO drinking water quality standards.

The importance of network water quality is reduced by the fact that very few households trust the quality of network water. A survey of water users in the BRWA service area revealed that two-thirds of households who subscribe to the network continue to purchase

water from other sources for potable use, not trusting the quality of their tap water. This does not mean that good quality network water is unimportant, but it does mean that water from other sources or undergoing additional treatment finally determines the quality of water ingested.

Water Quantity

An increase in available water from 60 lcd to 100 lcd promises to raise the benefits of water use enjoyed by households. It is unlikely to have any measurable health benefits, as 60 lcd already provides adequate water to cover all basic drinking, cooking, and hygiene needs. In the event, the new system does produce enough water to meet the output goals under the project.

Beneficiaries

The fundamental economic question in evaluating the project outcome is the number of people enjoying the use of the higher quality water, available at higher quantities. By this measure, at least in the short run, the project has not met its economic target. The simple arithmetic is as follows: "Legal connections to the network are still below expected figures, at 5,310 out of an expected 16,529…" [ISR 11, April 2012]. The expected number of connections is that consistent with serving the 49,000 people anticipated as project beneficiaries. The current status means that less than one-third of the expected number of people are benefiting from the project or, put another way, the economic cost of supplying water is more than triple that anticipated at appraisal and more than two-thirds of the people are not capturing the expected health benefits of the investment.

The beneficiary numbers need to be understood in the context of system sustainability. As noted above, one PDO indicator is the "increase in number of households legally connected to the water supply network." That indicator was chosen to capture an essential challenge to the sustainability of high quality water supply in Lebanon generally and in the West Beka'a service area in particular – the failure of network water beneficiaries to pay for the service they receive. Although this emergency Grant does not attempt a structural solution to the sustainability problem, it does acknowledge that problem through it reflection of national policy goals and proposed actions to improve service sustainability. Within the BRWA service area, other recent service upgrades have not been followed by significant consumer willingness to formalize their connections and pay their bills. This unwillingness likely does not reflect a low value placed on the water received, but rather a history of receiving that water – whether it is paid for or not. A history of low rates of payment has led to a vicious circle of inadequate revenue, leading to a deteriorating infrastructure and service levels noted in the West Beka'a Grant appraisal, that deterioration finally leads to a full and expensive reconstruction of supply and networks. In West Beka'a, the BRWA has adopted a new approach – households will not be connected to the upgraded service until they subscribe. This approach, supported by the Bank team, is not threatening the health of laggard households – the old supply network continues to function, ensuring that all households receive at least the quantity and quality of water available to them under the old system.

Cost (to households) of Water Supply:

Another dimension of the expected project benefits is a reduced cost of water supply for low-income families. The rationale behind this prospective benefit is not explained in the PAD. One likely rationale is that families were paying a price above the piped water tariff for water quantities above the 60 lcd from that system. Another rationale is that families were treating water from the piped supply because they did not trust it to be of potable quality and that with increased water quality after project completion; such treatment could end, thus saving money. To date, there is no evidence of either benefit being realized. Indeed, the cost of the new supply is higher than the old, since households did not have to pay for the old supply. Although the quality is higher, a water use survey done within the BRWA service area (not specifically on the West Beka'a beneficiaries) indicates that consumers continue to treat water, or purchase high quality water, even when piped water quality has increased. Over time, with evidence of consistently high piped water quality, household behavior might change; but in the short-run the goal of reduced costs has not been realized.

Annex 5. Summary of Borrower's ICR

COUNCIL FOR DEVELOPMENT & RECONSTRUCTION
BEIRUT- LEBANON

No. : 5710/1

Beirut, 05/11/2012

Mr. Ferid Belhaj
Country Director
Middle East Department
Middle East and North Africa Region

The World Bank
Lebanon Country Office
Beirut, Lebanon

Dear Mr. Belhaj,

***Subject**: Grant WB TF058085 –LE - West Beka'a Emergency Water Supply Project*
Draft Implementation Completion Report – ICR

We refer to your letter of October 4, 2012, with the attached Draft Implementation Completion Report for the West Beka'a Emergency Water Supply Project which closed on 20 May 2012.

We have reviewed the document thoroughly and wish to emphasize some points for your consideration as well as that of the Independent Evaluation Group (IEG), whom we understand will issue the final ratings on project preparation, design and implementation.

We are pleased to attach one Digital Copy of the Revised Draft ICR and as you will notice, we effected the changes and corrections requested by the CDR, directly on the text of the report; with the option to accept changes upon the last review.

As for the point related to the Beka'a Water Establishment (BWE) not meeting the goal of increasing the proportion of households connected to the network, we need to emphasize the following:

- First, we agree that the decision of the BWE to provide water only to those households that had legally connected and subscribed to the network, has been properly characterized as a politically unpopular and therefore very difficult decision to make.

  The ICR should more clearly credit the BWE with making a difficult and unpopular decision, with the support of CDR and the Ministry of Energy and Water, and acknowledge that requiring payment for services is a classical problem faced by the water and sanitation sector not only in Lebanon but also in many countries of the Middle East and North Africa.

  The BWE drew lessons from the parallel Baalbeck Water and Sanitation Project, as well as other water and sanitation projects under implementation in Lebanon, and implemented this strategy, which we consider to have been particularly successful.

- In addition, and while the ICR emphasizes that the intended 90% of beneficiaries do not receive water and therefore the project should be rated moderately unsatisfactory, we would nonetheless strongly request that the significant increase in numbers of subscriptions recorded after the implementation of the BWE strategy described above (around 68% from 3,145 to 5,310), in addition to the positive impact of the awareness raising campaign (developed and implemented with the direct assistance of the World Bank task team), be also acknowledged and described.

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Subscriptions to the network have continued past the Grant closing date and we are confident that the BRWA will continue to improve its financial sustainability in the short to medium term.

Finally, it is important that the ICR also reflects the critical fact that the Government has issued a decision to subsidize the BWE with a Grant of LBP.20 billion, in order to bolster operations. This should be taken into consideration in the assessment of the Borrower's performance.

Thanking you for your cooperation on this important project, we look forward to receiving the final version of this ICR.

Sincerely yours,

Council for Development and Reconstruction

Nabil A. El-Jisr
President

Enclosure: One CD

Annex 6. List of Supporting Documents

1. Technical Annex, March 19, 2007
2. Aide-Memoires/Management Letters
3. Resettlement Action Plan
4. PPIAF Survey Summary Analysis
5. BRWA West Beka'a Brochures
6. Ba'albeck Water and Sanitation Project Appraisal Document (P074042) and Implementation Completion Report (forthcoming)

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MAY 2011