

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: National

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics										Priority		
							Technical Constraints			Cost				Impact	Uncertainty				
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %			Span for rehab./repl. (d)		Yearly operation cost (e) %	Uncertainty
Water			Beirut & Mount Lebanon Establishment Master plan for the region		Water use and allocation optimised	Master plan and feasibility for the region to optimize the sustainable use, allocation and management of water resources. Strengthening the institutional capacity of the authorities. Implement Management software		1	2	1						50%	Optimisation of water resources use and allocation	Low	1
								1	2	0.5	1	30	35	10		30%		Low	2
Water			North Establishment Master plan for the region		Water use and allocation optimised	Master plan and feasibility for the region to optimize the sustainable use, allocation and management of water resources. Strengthening the institutional capacity of the authorities. Implement Management software		1	2	1			10			50%	Optimisation of water resources use and allocation	Low	1
Water								1	2	0.5	1	30	10	10		30%		Low	2
Water			Bekaa Establishment Master plan for the region		Water use and allocation optimised	Master plan and feasibility for the region to optimize the sustainable use, allocation and management of water resources. Strengthening the institutional capacity of the authorities. Implement Management software		1	2	1			10			50%	Optimisation of water resources use and allocation	Low	1
								1	2	0.5	1	30		10		30%		Low	2
			South Establishment Master plan for the region		Water use and allocation optimised	Master plan and feasibility for the region to optimize the sustainable use, allocation and management of water resources. Strengthening the institutional capacity of the authorities. Implement Management software	Study the capacity of water resources to meet future demand, taking into consideration the quantities allocated by C800	1	2	1				10		50%	Optimisation of water resources use and allocation	Low	1
Water								1	2	0.5	1	30		10		30%		Low	2
			National			Master plan to set guidelines & monitoring indicators for authorities to comply with. Inventory of water resources and guidelines for monitoring of water resources. Establish monitoring procedures and indicators, and operating procedures for authorities. Guidelines for groundwater use and choosing water resources, and for reuse of wastewater effluent. Guidelines for monitoring compliance of authorities.		1	2	1				10		50%	Guidelines set for authorities and proper monitoring of compliance.	Low	1

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Greater Beirut area

Present Population 1.5 Million
Population (2020) 1.74 Million

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics										Priority						
						ΔS	Remarks	Technical Constraints			Cost								Impact	Uncertainty				
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)	Yearly operation cost (e) %	Remarks				Uncertainty			
Water	G. Beirut	G. Beirut	Physical Stock																					
			Number and capacity of treatment plants(Beirut)	1; xxxx m3/day	1; 430.000 m3/day	Extension of Dbayyeh Treatment Plan	This Project is financed by the Italian Protocole included elsewhere	This treatment plant is an essential element of Bisri-Beirut or Damour projects	1	2	3.27												1	
			Number and capacity of treatment plants(Ein Eidelbeh)	1; 100,000 m3/day	2Treatment plants																			
			Number and capacity of reservoirs(m3)(Beirut)	33; 95900m3	33; 95900m3	Rehabilitation of reservoirs (43600 m3; lower Achrafieh, upper Achrafieh, Borj Abu Haidar)	This volume is based on the Societé Générale diagnostic. The responsible authority should conduct a more detailed diagnostic		2	4	1.3		1	10	35	10				30%			High	1
			Number and capacity of reservoirs(m3)(Ein Eidelbeh)	8; 10200 m3	111,400 m3	Rehabilitation of reservoirs (6750 m3)	This volume is based on the Societé Générale diagnostic. The responsible authority should conduct a more detailed diagnostic		2	3	0.2		1	10	35	10				30%			High	1
			Length of network (Transmission+Distribution)(km)(Beirut)	1210 km	1210 km	Replace 1120 km of network	This length is based on the Societé Générale diagnostic. The responsible authority should conduct a more detailed diagnostic		2	7	167		1	10	10	10				80%			High	3
			Length of network (Transmission+Distribution)(km)(Ein Eidelbeh)	987 km	987 km	Replace 590 km of network	This length is based on the Societé Générale diagnostic. The responsible authority should conduct a more detailed diagnostic		2	5	89		1	10	10	10				80			High	3
Water	G. Beirut	G. Beirut				Bisri Beirut Project (Bisri Dam: 100 Mm3/year (75% for domestic water and 25% for irrigation) OR Damour Beirut Project	Hydraulic constraints based on water level determined by hydropower operation		1	7	143	50	1	10	10	15		1994: Investment cost: 143 US\$, operation cost: 3.4 MUSS/year	30%			Low	3	
						Damour Beirut Project	Feasibility study		2	7	1				10				50%	Optimization use of Damour river and groundwater resources (Mechref, elDamour, Naamé) by recharge of groundwater in dry season (0.5m3/s), exploitation of the river in humid season to increase the water transmission capacity to Tallet-EI Khayyat from 16Mm3/year to 32 Mm3/year. These quantities are insufficient to meet the actual and future demand for Great-Beirut. For this reason, this project should accompanied with Bisri-Awali.	Medium		1	
Water	G. Beirut	G. Beirut	Institutional Setup																					
			Subscriptions number(Beirut)	NA																				
			Subscriptions number(Ein Eidelbeh)	NA																				
			Number of Staff (Beirut)	340	435,000	110,000 water meters to install			2	7	27.5		1	20	35	10				30%			Low	2
Water	G. Beirut	G. Beirut	Number of Staff (EinEidelbeh)	137		220,000 water meters to install																		
			Number of water meters	0		105,000 water meters to install			23	7	26.2		1	20	10	10				50%			Low	x
Water	G. Beirut	G. Beirut	Management Software	No	Yes																			
			Economic values:																					
			Investment (a)	387.1	518.9																			
			Land value / expropriation (a')	23.1	73.1																			
			Yearly maintenance cost (b)	1.4%	1%																			
			Major rehab/replac. cost (c)	5%	10%																			
Water	G. Beirut	G. Beirut	Span for rehab/replc (d)	14	40																			
			Yearly operation cost (e)	5%	12																			
			Performance Indicators:																					
			Results																					

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics										Priority			
								Technical Constraints			Cost				Impact	Uncertainty					
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %			Span for rehab./replac. (d)		Yearly operation cost (e) %	Remarks	Uncertainty
			Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day)	375,000/410,000																	
			Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day)	522,000/410,000	Equal or less than 1																
			Number of supply hours/day	NA	24																
			Quality of water vs. international norms	Saline intrusion	Good																
			% of network ages more than 35 years (Beirut)	92%	0																
			% of network ages more than 35 years (Ein Eldelbeh)	60%	0																
			Percentage of unaccounted for water (%) (Beirut)	ND	20%																
			Percentage of unaccounted for water (%) (Ein Eldelbeh)	ND	20%																
			Means																		
			Number of staff per 1000 connections (Beirut)	1.34	2																
			Number of staff per 1000 connections (Ein Eldelbeh)	1.41																	
			Percentage of water metering coverage per water authority (%) (Beirut)	0	100%																
			Percentage of water metering coverage per water authority (%) (Ein Eldelbeh)	0																	
			Collection ratio of fees (%) (Beirut)	> 90 %	90%																
			Collection ratio of fees (%) (Ein Eldelbeh)	50-60 %																	
			Beirut: Revenues of water authority (Milliards LL)- expenditures of water authority (Billions LL)	2001: 42.42-35.90	Equal or more than 0																
			Ein Eldelbeh: Revenues of water authority (Billions LL)- expenditures of water authority (Billions LL)	2001: 13.4-5.24	Equal or more than 0																

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Barouk

Present Population 353,000
Population (2020) 410,000

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Technical Constraints		Characteristics							Impact	Uncertainty	Priority				
						ΔS	Remarks	Description	Min. delay to start (Year)	Min. constr. Period (Year)	Cost												
											Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)	Yearly operation cost (e) %				Remarks	Uncertainty		
Water		Mount Leb.	Physical Stock Number and capacity of treatment plants	0	1 Treatment plant	Total capacity: 50,000 m3/day, the first phase: 25,000 m3/day. It represents a component of Iklim ElKharoub project	Included elsewhere																
Water		Mount Leb.	Number and capacity of reservoirs(m3)	Number: 89; capacity: 71200 m3	82,000 m3	Rehabilitation of reservoirs (39950 m3)		This volume is based on the Societé Générale diagnostic. The responsible authority should conduct a more detailed diagnostic	2	5	1.2	1	10		10		30%			High	1		
Water		Mount Leb.	Length of network (Transmission+Distribution)(km)	2174 km	2198.6 km	1536 km of pipe for replacement		This project necessitates to conduct the diagnostic study of water supply systems. This length is based on the Societé Générale diagnostic. The responsible authority should conduct a more detailed diagnostic	3	15	230.4	1	10		10		100%	Reduce water losses		High	3		
Water		Mount Leb.				Iklim elkhroub Project (Dahr El-Saouaneh Hill, transmission line, and TP). 24,6 km of transmission pipes) Pumping station: Q= 292 l/s, 255 m (located at Dahr El-Saouaneh Hill) Reservoirs (36,000 m3), the first phase: 22,000 m3, including raw water reservoirs: 4000 m3. Treatment plant: 50,000 m3/day, the first phase: 25,000 m3/day		This project necessitates to update the feasibility study	2	5	32	5.25	1	10	10	15	Phase 1: 21,3 millions usd.	50%	This project increases the water production 17 Mm3/year		Low	1	
Water		Mount Leb.				Works on Barouk and Kaa springs		This project is proposed in the CDR list	1	3	4							Increase water supply 5000 m3/day			1		
Water		Mount Leb.				Diagnostic of water supply systems			1	2	0.2			10			50%	Evaluation of water supply system		Low	1		
Water		Mount Leb.				Supply with Potable Water of Jerd Aaley Region (Convey water to 13 villages (58,000 hab) by drilling and equipping 4 new boreholes in Ain Dar-Es Safa valley)		Does not include distribution network	1	2	6.2		1	10	10	15		50%	increase supplyto 145l/cap/d		Low	1	
Water		Mount Leb.	Institutional Setup Subscriptions number Number of Staff Number of water meters	65,247 178 0	102,500 181 102,500	26,000 water meters to install 52,000 water meters to install 24,500 water meters to install			2 8 20	6 12 6	6.5 13 6.1	1 1 1	20 20 20	10 35 10	10 10 10		30% 50% 50%			Low Low Low	2 3 x		
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	120 14 0.5% 2% 15 2%	153 19 1% 10% 40 12																		
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day)(Barouk with Iklim Kharoub) Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day)(Iklim Kharoub without Barouk) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day)(Iklim Kharoub without Barouk)	88,250/56,680 23,000/8,300 33,500/8,300																			

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Technical Constraints		Characteristics								Impact	Uncertainty	Priority	
						ΔS	Remarks	Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)	Yearly operation cost (e) %	Remarks				Uncertainty
			Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day)(Barouk with Iklim Kharoub) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years Percentage of unaccounted for water (%) Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	102.500/56.680	Equal or less than 1 24 Good 0 20% 2 100% 90% Equal or more than 0																

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Metr

Present Population 162,000 Population (2020) 188,100

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics										Priority		
							Technical Constraints		Cost					Impact	Uncertainty				
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %			Span for rehab./replc. (d)		Yearly operation cost (e) %	Uncertainty
Sp	St	ΔS	Remarks																
Water		Mount Leb.	Physical Stock Number and capacity of treatment plants Number and capacity of reservoirs(m3)	1; 3600 m3/day 12; 19500 m3	37620m3	8,000 m3 of reservoirs for rehabilitation	This volume is based on the Societé Générale diagnostic. The responsible authority should conduct a more detailed diagnostic	1	3	0.24	1	10	10	10	30%		High	1	
Water		Mount Leb.	Length of network (Transmission+Distribution)(km)	943 km	958 km	845 km of network for replacement	High, this length is based on the Societé Générale diagnostic. The responsible authority should conduct a more detailed diagnostic	1	15	127	1	10	10	10	80%		High	3	
Water		Mount Leb.				Dashoumieh Spring Project (Construction of new transmission lines)		1	1	1	1	10	10	10	50%	Increase 5,000 m3/day the quantity of domestic water	High	3	
Water		Mount Leb.				Construction of transmission lines from Chabrouh Dam to Metr		3	6	6	1	10	10	10	50%	Increase the quantity of domestic water in higher and central Metr by 14.000 m3/day for 200 days in year	Low	1	
Water		Mount Leb.				Diagnostic study for water supply systems		1	2	0.2			10		50%	Evaluation of water supply system	Low	1	
Water		Mount Leb.				Drinking water works in Metr Area (Equipping 4 wells, constructing & equipping 5 pumping stations, construction of lift and transmission lines, construction of 3 regional reservoirs and 13 distribution reservoirs)	Depends on the construction of Qisamoun water project	1	1.5	16.7	2.5	1	10	10	15	50%		Low	3
Water		Mount Leb.	Institutional Setup Subscriptions number Number of Staff Number of water meters	36,600 82 0	90 47,000	12,000 water meters for implementation		2	5	3	1	20	35	10	30%		Low	2	
						24,000 water meters for implementation		7	10	6	1	20	10	10	50%		Low	3	
						11,000 water meters for implementation		17	5	2.8	1	20	35	10	50%		Low	x	
			Management Software	No	Yes														
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	22 3 4.6% 19% 16 17%	53.3 5.1 1% 10% 40 12														
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years Percentage of unaccounted for water (%) Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	40,500/30,350 56,430/30,350 NA NA 89,6 % ND 1.83 0 > 90 % 9.22-7.55	Equal or less than 1 24 Good 0 20% 2 100% 90% Equal or more than 0														

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Kesrwan

Present Population 137,000
Population (2020) 159,000

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics										Priority			
								Technical Constraints			Cost					Impact	Uncertainty				
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab/replac. (d)				Yearly operation cost (e) %	Uncertainty	
Water		Mount Leb.	Physical Stock Number and capacity of treatment plants	0	1 Treatment plant at Chabrouh Dam	Treatment plant at Chabrouh Dam		Depends on the construction of Chabrouh Dam	3	7	2.5	0.62	5	35		15	50%	Increase 60,000 m3/day the quantity of water supply	High	3	
Water		Mount Leb.	Number and capacity of reservoirs(m3)	60; 43,000 m3	60; 43,000 m3	Reservoirs (9000 m3) for rehabilitation	This volume of reservoirs for rehabilitation is based on the Societe Générale diagnostic. The responsible authority should conduct a more detailed diagnostic		1	3	0.27		1	10	10	10	30%		High	1	
Water		Mount Leb.	Length of network (Transmission+Distribution)(km)	564 km	564 km	448 km for replacement (Relocating Transmission line)	This length is based on the Societe Générale diagnostic. The responsible authority should conduct a more detailed diagnostic		1	4	67		1	10	10	10	80%		High	3	
Water		Mount Leb.				Relocating transmission line Kesrwan coastal area (Nahr El Kalb- to Naher Ibrahim) Project			1	4	1.9		1	10	10	10	20%		Low	3	
Water		Mount Leb.				Developing the main gravity transmission network from El Madiq Spring, and the distribution networks in order to provide for the present and future demands of Kesrwan coastal area.			3	7	12								Medium	3	
Water		Mount Leb.				Water supply project in higher and mid Metn	A part of this project is excuted by water authority	Depends on the construction of Chabrouh Dam													
Water		Mount Leb.				Replace distribution pipes (In parallel to on-going work), 21km. House connections, 256 km.			2	5	20		1	20	10	10	20%		Low	2	
Water		Mount Leb.				Diagnostic study of water supply			1	2	0.2				10		50%	Evaluation of water supply system	Low	1	
Water		Mount Leb.	Institutional Setup Subscriptions number Number of Staff Number of water meters	45,000 138 0	45,000	10,000 water meters for installation			2	5	2.5		1	20	10	10	30%		Low	2	
						20,000 water meters for installation			7	10	5		1	20	35	10	50%		Low	3	
						15,000 water meters for installation			17	5	3.75		1	20	35	10	50%		Low	x	
			Management Software	No	Yes																
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	41 9 3.8% 16% 17 14%	42 10 1% 10% 40 12																
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years Percentage of unaccounted for water (%) Means	34,250/50,000 47,700/50,000 NA NA 79% 35%	In wet season, available water: 95,300 m3/day Equal or less than 1 24 Good 0 20%	High amount of water demand for industrial purposes In wet season, available water: 95,300 m3/day															

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics									Impact	Uncertainty	Priority
								Technical Constraints			Cost								
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)	Yearly operation cost (e) %			
			Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	2.5 0 > 90 % 2002: 9,6 - 11.6	2 100% 90% Equal or more than 0														

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Jbeil

Present Population 170,000
Population (2020) 197,400

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics										Priority			
							Technical Constraints		Cost					Impact	Uncertainty					
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %			Span for rehab/replc. (d)		Yearly operation cost (e) %	Uncertainty	
Water		Mount Leb.	Physical Stock Number and capacity of treatment plants	1 Treatment plant, 15,000 m3/day	1 Treatment plant, 15,000 m3/day	Network Rehabilitation in Jbeil	This Project is proposed in the CDR list- financed by Italian Protocole		0.5	2	25						50%	Reduce Losses	Medium	1
Water		Mount Leb.	Number and capacity of reservoirs(m3)	43 reservoirs, 10250 m3	100 reservoirs; 39,000 m3	Exploitation of Nahr Ibrahim (1 pump station, 43 proposed reservoirs (29,000 m3), and 19 km transmission). Capacity of this project: 22,000 m3/day, 35 % of the total demand for the caza for 25 years	The treatment plant is extended to 15,000 m3/day, but the existing transmission line from Nahr Ibrahim doesn't meet with this capacity		1	2	0.5	27	1	10	10	15	50%		Low	1
Water		Mount Leb.	Length of network (Transmission+Distribution)(km)	273 km (known network)	292 (known network)	Water supply project for Laqlouq (equipment of 2 water intakes, 1 reservoir (400 m3), and transmission lines)			1	2	0.2	0.16	1	10		15	50%		Low	3
Water		Mount Leb.				Water supply project for North-Western region (5 water intakes, and Qatra Spring, 10 reservoirs (2250 m3), and transmission lines)			1	2	0.2	1.6	1	10	10	15	50%		Low	3
Water		Mount Leb.				Water supply project for Kharbe region (1 groundwater intake, 1 reservoir(500 m3))			1	2	0.2	0.16	1	10	10	15	50%		Low	3
Water		Mount Leb.				Water supply project for Afqa, Kartaba and Akoura regions (Water intake from Afqa, and Eirweis springs, 2 proposed reservoirs(200 m3 capacity), 1 proposed pump station in Qartaba, and transmission line)			1	2	0.2	0.31	1	10	10	15	50%		Low	3
Water		Mount Leb.	Institutional Setup Subscriptions number Number of Staff Number of water meters Management Software	16,600 114 0 No	49,350 Yes	12,350 water meters to install 24,700 water meters to install 12,300 water meters to install			2 6 14	4 8 4	3.1 6.2 3.1		1 1 1	20 20 20	10 10 10	10 10 10	30% 50% 50%	Low Low Low	2 3 x	
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	13 3 3.0% 13% 18 11%	16 32 1% 10% 40 12															
			Performance Indicators: Results Actual quantity of water demand (m3/day)/Actual quantity of exploited resources(m3/day) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years Percentage of unaccounted for water (%) Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	34,000/13,000 49,350/13,000 NA NA 100 % of transmission pipes NA 3.45 0 More than 90 % 2001: 3.5-2.8	Equal or less than 1 24 Good 0 20% 2 100% 90% Equal or over than 0															

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Tripoli

Present Population 400,000 Population (2020) 464,390

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics										Priority			
							Technical Constraints			Cost				Impact	Uncertainty					
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %			Span for rehab./replc. (d)		Yearly operation cost (e) %	Uncertainty	
Water		North Leb.	Physical Stock Number and capacity of treatment plants	1; 40,000 m3/day	1; 70,000 m3/day	Extension of treatment plant in Tripoli		3	7	4.5		5	35	35	15	50%	Increase 30,000 m3/day the water supply quantities	Low	1	
Water		North Leb.	Number and capacity of reservoirs(m3)	59700 m3	59700 m3															
Water		North Leb.	Length of network (Transmission+Distribution)(km)	300	300	Need for 60,000 m3/day of water in the horizon 2020 Rehabilitation of 150 km of network		5	1	1.62		1	10	10	15	50%		Medium	3	
Water		North Leb.	Institutional Setup Subscriptions number Number of Staff Number of water meters	49,000 98 40,000	116,100 160 116,100	19,000 water meters for installation 38,000 water meters for installation 19,100 water meters for installation		1	3	17		1	10	10	10	100%		Low	1	
Water		North Leb.	Management Software	No	Yes			2	8	4.8		1	20	10	10	30%		Low	2	
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	57 5 0.9% 5% 20 30%	57 5 1% 10% 40 12															
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years Percentage of unaccounted for water (%) Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	80,000/87,000 139,317/87,000 24 Good 40% 65% 1.22 81.60% 35% XXX-3.9	Equal or less than 1 24 Good 0 20% 2 100% 90% Equal or more than 0															

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Akkar

Present Population 211,470 Population (2020) 245,500

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics										Priority				
						ΔS	Remarks	Technical Constraints		Cost						Remarks	Uncertainty		Impact	Uncertainty		
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)						Yearly operation cost (e) %	
			Physical Stock Number and capacity of treatment plants	0	0																	
Water		North Leb.	Number and capacity of reservoirs (m3)	81 reservoirs, 42400 m3	49,100m3	35 reservoirs for rehabilitation (4750 m3)			1	2	0.14		1	10	10	15		30%		Low	2	
Water		North Leb.	Length of network (Transmission+Distribution)(km)	179 km (transmission), and 147 km (distribution)	179 km (transmission), and 147 km (distribution)	Renovation of 70 km transmission lines in all areas, and of 18 km in Halba			1	2	22		1	10	10	15	17.5 (all areas), and 4.5 (Halba)	30%		Low	2	
Water		North Leb.				Provision of water quality laboratory in the authority			3	2	0.25			10				50%	More control of water quality	Medium	3	
Water		North Leb.				Provision of water intakes (The authority should increase the water production to meet actual and future demand, by alimentionation of electricity to 25 intakes from ground water resources (this could increase production of water 29,300 m3/day))			2	4	0.25		1	10	10	15		50%		Low	1	
Water		North Leb.				Operation by the authority of 3 systems constructed in 2002 (projects Ain Yaakoub, Beit Mallat, and Akroum-Kfar toun) by connections of all population to distribution pipes			1	1							included elsewhere			Low	2	
Water		North Leb.				Water Supply for villages related to Kama reservoir: Beit Ayoub, Beit Younes, Karyat and Kama	This project is financed by SFD, and AFESD		0	3	4.15										Medium	1
Water		North Leb.				Water Supply for villages related to reservoirs Harrar and Kabit			1	2	9.9										Medium	1
Water		North Leb.				Study and construction of 70 Kms of network and reservoirs and pumping stations for the plane of Akkar				5	22	0.62	1	10	10	15		50%		Low	1	
Water		North Leb.	Institutional Setup Subscriptions number Number of Staff Number of water meters	7,800 18 0	61,375 50 61,375	15,500 water meters to implement	This number takes into consideration the connections number of local comities, and the projection of connection number for 15 years		2	4	3.9		1	20	35	10		30%		Low	3	
						31,000 water meters to implement			6	8			1	20		10		50%		Low	x	
						14,875 water meters to implement			14	4			1	20	10	10		50%		Low	x	
			Management Software	No	Yes																	
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	36 5 0.4% 2% 21 1%	58 6 1% 10% 40 12																	
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years	42,300/10,621 61,375/10,621 NA The water quality should be enhanced: Total number of coliforms/100 ml= 1 to 4. the norm impose total absence of this parameter. 39% (transmission), and 13 % (distribution)	 Equal or less than 1 24 Good 0																	

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics										Priority		
						ΔS	Remarks	Technical Constraints		Cost						Impact	Uncertainty			
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab./replac. cost (c) %	Span for rehab./replac. (d)				Yearly operation cost (e) %	Remarks
			Percentage of unaccounted for water (%) Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	35 % leakage in transmission network from Nabaa El Saber source, 38 % illegal connections 0.72 0 70% 2002: 1.1-0.997	20% 2 100% 90% Equal or more than 0															

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics										Impact	Uncertainty	Priority
						ΔS	Remarks	Technical Constraints		Cost						Remarks	Uncertainty			
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replac. (d)					
			Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	2.93 0 85% 2002: 1.826-1.476	2 100% 90% Equal or more than 0															

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Zgharta

Present Population 135,000
 Population (2020) 156,750

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics											Priority		
							Technical Constraints			Cost					Impact	Uncertainty				
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)			Yearly operation cost (e) %		Remarks	Uncertainty
Water		North Leb.	Physical Stock Number and capacity of treatment plants Number and capacity of reservoirs(m3) Length of network (Transmission+Distribution)(km)	0 44; 7025 m3 77 km (transmission), 236 km (distribution)	0 31,350 m3 82 km (transmission), 236 km (distribution)	Rehabilitation of 77 km (transmission), and 169 km (distribution)		1	4	29.4		1	10	10	15	19.25 (transmission), 10.14 (distribution)	30%	Reduce losses	Low	2
Water		North Leb.				Ehden Project	Proposed in the CDR List- Financed by AFD	0	1.5	5									Medium	1
Water		North Leb.	Exploited resources are insufficient to meet actual and future water demand	Exploited resources are sufficient to meet actual and future water demand	Upgrading of catchment hydraulic structures	Nabee Mar Sarkis (capacity : 65,000 m3/day could be an alternative to study by the authority)(Actually, 20 % of the resources are used).	Topographic constraints	1	3	0.5		1	10	10	15		40%	Using this resource could reduce the cost of power (0,5 milliard LL/year).	Medium	2
Water		North Leb.				3 Pumping stations at Nabee El-Kadi		1	3	0.1	0.0075	1	10	10	15		40%	Increase the capacity of exploited resources	Low	2
Water		North Leb.				construction of reservoirs (9500 m3)		1	3	2.4	0.31	1	10	10	15		40%			3
Water		North Leb.				5 km of transmission network for construction		1	3	1.2		1	10	10	15		50%		Low	3
Water		North Leb.	Institutional Setup Subscriptions number Number of Staff Number of water meters	3200 (without illegal connections and users from local comities) 16 0	39,200 50 39,200	10,000 water meters for installation 20,000 water meters for installation 9,200 water meters for installation		2	5	2.5		1	20	10	15		30%		Low	3
								7	10	5		1	20	10	15		50%		Low	x
								17	5	2.3		1	20	10	15		50%		Low	x
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	10 3 1.4% 8% 24 5%	13 3 1% 10% 40 12															
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years Percentage of unaccounted for water (%) Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	27,000/12,900 39,190/12,900 NA Good 100 % (transmission), and 72 % (distribution) 84 % UFW (42 % leakage, and 42 %illegal connections) 0.6 0 72%	 Equal or less than 1 24 Good 0 20% 2 100% 90% Equal or more than 0															

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Minieh

Present Population 75,000 Population (2020) 87,100

Sector	Sub-sector	Geographic area	Component	Present Situation Sp	Target Situation St	Projects ΔS	Remarks	Characteristics										Impact	Uncertainty	Priority	
								Technical Constraints			Cost										
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)	Yearly operation cost (e) %	Remarks				Uncertainty
Water		North Leb.	Physical Stock Number and capacity of treatment plants Number and capacity of reservoirs(m3) Length of network (Transmission+Distribution)(km)	0 97 reservoirs; 19,750 m3 129.2 km (transmission), 380 km (distribution)	0 97 reservoirs; 19,750 m3 129.2 km (transmission), 380 km (distribution)	Rehabilitation of 56,4 km (transmission) and 124,7km (distribution)		1	3	21.6		1	10	10	15	14.1 (transmission), 7.48 (distribution)	30%	Reduce losses	Low	2	
			The available resources are sufficient to meet future domestic demand if the authority operates the 2 projects constructed by CDR. Total capacity of resources: 117,000 m3/day in winter, and 74,000 m3/day in summer. The water demand for irrigation: 71,333 m3/day. The total used volume for all sectors= 47,000 m3/day.		The available resources are sufficient to meet future domestic demand.																
Water		North Leb.	Institutional Setup Subscriptions number Number of Staff Number of water meters	8,400 42 0	21,800 60 21,800	5,500 water meters for installation 11,000 water meters for installation 5,300 water meters for installation		2	4	1.4		1	20	35	15		30%		Low	3	
			Management Software	No	Yes			6	8	2.8		1	20	10	15		50%		Low	x	
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	5 0 2.9% 18% 25 11%	27 0 1% 10% 40 12			14	4	1.3		1	20	10	15		50%		Low	x	
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years Percentage of unaccounted for water (%) Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	15,000/16,200 21,775/16,200 NA 0 à 3 coliforms/100ml, but Good quality 43.6 % (transmission), and 33 % (transmission) 66.75 % UFW (27.5 % leakage, and 40 % illegal connections)	Equal or less than 1 24 Good 0 20% 2 100% 90% Equal or more than 0																

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Bcharré

Present Population 78,000 Population (2020) 90,600

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics										Priority				
							Technical Constraints		Cost					Impact	Uncertainty						
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %			Span for rehab./replc. (d)		Yearly operation cost (e) %	Remarks	Uncertainty	
Water		North Leb.	Physical Stock Number and capacity of treatment plants	0	0																
Water		North Leb.	Number and capacity of reservoirs(m3)	15 reservoirs (6390 m3)	18,000m3	11 reservoirs (3,190 m3) for rehabilitation		1	2	0.095		1	10	10	10		30%		Low	2	
Water		North Leb.	Length of network (Transmission+Distribution)(km)	17,8 km (transmission), and 43 km (distribution)	17,8 km (transmission), and 43 km (distribution)	3160 m3 of reservoirs for construction		2	2	0.79	0.12	1	10	35	10		40%		Low	3	
						16 km (transmission), and 33 km (distribution) for renovation		1	2	6		1	10	10	10		30%		Low	2	
				The available resources are sufficient to meet domestic demand. This region is rich in water. Total capacity of resources= 90,200 m3/day (winter), and 24,500 (summer). 250 Ha are actually irrigated (total irrigated area= 2,500 Ha)	The available resources are sufficient to meet future domestic demand.	Water Supply Project in Bcharré		0.5	3	12									Medium	1	
Water		North Leb.	Institutional Setup Subscriptions number	3,750	22,650																
			Number of Staff	17	20																
			Number of water meters	0	22,650	5,700 water meters for installation		2	4	1.4		1	20	10	15		30%		Low	3	
						11,400 water meters for installation		6	8	2.8		1	20	10	15		50%		Low	x	
						5,550 water meters for installation		14	4	1.4		1	20	10	15		50%		Low	x	
			Management Software	No	Yes																
			Economic values:																		
			Investment (a)	3	5																
			Land value / expropriation (a')	1	1																
			Yearly maintenance cost (b)	0.0%	1%																
			Major rehab/replac. cost (c)	0%	10%																
			Span for rehab/replc (d)	26	40																
			Yearly operation cost (e)	0%	12%																
			Performance Indicators:																		
			Results																		
			Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day)	15,600/35,000																	
			Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day)	22,650/35,000	Equal or less than 1																
			Number of supply hours/day	NA	24																
			Quality of water vs. international norms	Good	Good																
			% of network ages more than 35 years	90 % (transmission), and 76 % (distribution)	0																
			Percentage of unaccounted for water (%)	54 % UFW (24% leakage, and 30% illegal connections)	20%																
			Means																		
			Number of staff per 1000 connections	1.68	2																
			Percentage of water metering coverage per water authority (%)	0	100%																
			Collection ratio of fees (%)	52%	90%																
			Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	2002: 386-195	Equal or more than 0																

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Jabal Amel

Present Population 282,000 Population (2020) 328,000

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics										Priority		
							Technical Constraints			Cost				Impact	Uncertainty				
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Investment Mil US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %			Span for rehab./replc. (d)		Yearly operation cost (e) %	Uncertainty
ΔS	Remarks	ΔS	Remarks	ΔS	Remarks	ΔS	Remarks	ΔS	Remarks	ΔS	Remarks	ΔS	Remarks	ΔS	Remarks				
Water		South Leb.	Physical Stock Number and capacity of treatment plants (m3/day)	Station of Taybeh, 7000m3	Extension of Taybeh Treatment Plant capacity, 25000m3	On-going	This project depends on C800										Increase the potable water quantity in the region (18,000 m3/day)	Low	2
Water		South Leb.	Number and capacity of reservoirs(m3)	89 reservoirs, 21850	65,000	2200m3 of reservoirs for rehabilitation (System 16-E03-Touline region); and 700m3 at system 16-E08 (Chibaa region)		1	1	0,07		1	10	10	10	30%		Low	2
Water		South Leb.	Length of network (Transmission+Distribution)(km)	807 Km Distribution, 330 Km Transmission	807 Km Distribution, 350 Km Transmission	12600m3 of reservoirs for construction		1	15	3,2	3	1	10	10	10	40%	Increase capacity of storage	Low	3
Water		South Leb.	Length of network (Transmission+Distribution)(km)	807 Km Distribution, 330 Km Transmission	807 Km Distribution, 350 Km Transmission	330 km of transmission networks for renovation		1	15	82,5		1	10	10	10	30%	Reduce leakage	Low	3
Water		South Leb.				107 km of distribution networks for renovation (Old Distribution network is mainly located at Aita El Jabal, Bir Assalasel, Hasbaya, Kawkaba, El-meri, Kfarchouba, Chouaya, Abou Qamha, Ain Qinya, El-Fardis, El-Majidiyé)		1	6	6,4		1	10	10	10	50%	Reduce leakage	Low	2
Water		South Leb.	Institutional Setup Subscription number	24,000	82,000														
Water		South Leb.	Number of Staff	58	82,000	20,500 water meters for implementation		2	5	5,1		1	20	10	10	30%	Encourage conservation of water, control the input and output of water systems	Low	3
Water		South Leb.	Number of water meters	0		41,000 water meters for implementation		7	10	10,2		1	20	10	10	50%		Low	x
Water		South Leb.	Management Software	No	Yes	20,500 water meters for implementation		17	5	5,1		1	20	35	10	50%		Low	x
			Economic values: Investment (Mil\$) (a)	54	257														
			Land value / expropriation (a')	7	15														
			Yearly maintenance cost (b)	0.7%	1%														
			Major rehab/replac. cost (c)	2%	10%														
			Span for rehab/replc (d)	10	40														
			Yearly operation cost (e)	2%	12														
			Performance Indicators:																
			Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day)	56,400/40,000															
			Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day)	82,000/40,000	Equal or less than 1														
			Number of supply hours/day	NA	24														
			Quality of water vs. international norms	Good	Good														
			% of network ages more than 35 years	13 % (Distribution), 100 % (Transmission)	0														
			Percentage of unaccounted for water (%)	(20 % leakage, 10 % illegal connections and 30 % Unaccounted for water)	20%														
			Means Number of staff per 1000 connections	2.41	2														
			Percentage of water metering coverage per water authority (%)	0	100%														
			Collection ratio of fees (%)	53%	90%														
			Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	2003: 2.87 -2.65	Equal or more than 0														

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics										Priority	
								Technical Constraints			Cost					Impact	Uncertainty		
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Inv. Million US\$	Land value / expro. (a) Mill US\$	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d) (Year)				Yearly operation cost (e) %
			Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	83% 8.6-6.2	90% Equal or more than 0	ΔS	Remarks												

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Baalback-Hermel

Present Population 282,000 Population (2020) 327,395

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects		Characteristics										Priority	
						ΔS	Remarks	Technical Constraints			Cost						Impact		Uncertainty
								Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab/replac. (d)	Yearly operation cost (e) %			
Water		Bekaa	Physical Stock Number and capacity of treatment plants	0	All cities, and villages have a water supply in good quantity and quality conditions	Diagnostic study for water supply sector		1	2	0.2				10		50%		Low	1
Water		Bekaa	Number and capacity of reservoirs(m3) Length of network (Transmission+Distribution)(km)	36; 25,085 m3 534 km (transmission), and 434 km (distribution)	65,000 m3	Water Supply project for Labwe, Ras Baalback, and Alkaa systems	10 km of transmission lines	1	2	5								Medium	1
Water		Bekaa	Institutional Setup Subscriptions number Number of Staff Number of water meters	19,134 168 0	81,850 81,850	20,500 Water meters for installation 41,000 Water meters for installation 20,350 Water meters for installation		2	5	5.1		1	20	10	15	30%		Low	3
			Management Software	Yes	Yes			7	10	10.2		1	20		15	50%		Low	x
			Economic values: Investment (a) Land value / expropriation (a') Yearly maintenance cost (b) Major rehab/replac. cost (c) Span for rehab/replc (d) Yearly operation cost (e)	49 2 1.0% 7% 27 4%	58 2 1% 10% 40 12			17	5	5.1		1	20		15	50%		Low	x
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day) Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day) Number of supply hours/day Quality of water vs. international norms % of network ages more than 35 years Percentage of unaccounted for water (%) Means Number of staff per 1000 connections Percentage of water metering coverage per water authority (%) Collection ratio of fees (%) Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	56,400/62,780 81,850/62,780 NA NA 53 % (transmission), NA (distribution) 60% 3.19 0 30% 3.3-3.5	Equal or less than 1 24 Good 0 20% 2 100% 90% Equal or more than 0														

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Zahlé

Present Population 125,000 Population (2020) 145,100

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics											Priority		
							Technical Constraints			Cost					Impact	Uncertainty				
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)			Yearly operation cost (e) %		Remarks	Uncertainty
Water		Bekaa	Physical Stock Number and capacity of treatment plants	1; 9600 m3/day	1; 9600 m3/day	Diagnostic study for water supply sector		1	2	0.2							50%		Low	1
Water		Bekaa	Number and capacity of reservoirs(m3)	31; 6600	29,000 m3															
Water		Bekaa	Length of network (Transmission+Distribution)(km)	164 km (transmission), 409 (distribution)	164 km (transmission), 409 (distribution)	Construction of reservoirs (8900 m3)		1	3	2.2	0.32	1	10	10	15		40%		Low	3
Water		Bekaa	Institutional Setup Subscriptions number	25,381	36,275															
Water		Bekaa	Number of Staff	51	76															
Water		Bekaa	Number of water meters	0	36,275	9,100 water meters for installation		2	4	2.3		1	20	10	15		30%		Low	3
Water		Bekaa				18,200 water meters for installation		6	8	4.6		1	20	10	15		50%		Low	x
Water		Bekaa				8,975 water meters for installation		14	4	2.2		1	20	10	15		50%		Low	x
			Management Software	Yes	Yes															
			Economic values: Investment (a)	22	24															
			Land value / expropriation (a')		0															
			Yearly maintenance cost (b)	2%	1%															
			Major rehab/replac. cost (c)	17%	10%															
			Span for rehab/replc (d)	28	40															
			Yearly operation cost (e)	9%	12															
			Performance Indicators: Results Actual quantity of water demand (m3/day)(2006)/Actual quantity of exploited resources(m3/day)	25,000/32,000																
			Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day)	36,275/32,000	Equal or less than 1															
			Number of supply hours/day	NA	24															
			Quality of water vs. international norms	NA	Good															
			% of network ages more than 35 years	NA	0															
			Percentage of unaccounted for water (%)	40 % UFW	20%															
			Means Number of staff per 1000 connections	1.34	2															
			Percentage of water metering coverage per water authority (%)	0	100%															
			Collection ratio of fees (%)	43%	90%															
			Revenues of water authority(Billions LL)-expenditures of water authority (Billions LL)	3-4	Equal or more than 0															

Sector: Water supply
Sub-Sector / Technically Autonomous Unit: Chamsine

Present Population 165,000 Population (2020) 191,600

Sector	Sub-sector	Geographic area	Component	Present Situation	Target Situation	Projects	Characteristics										Priority		
							Technical Constraints			Cost					Impact	Uncertainty			
							Description	Min. delay to start (Year)	Min. constr. Period (Year)	Million US\$	Land value / expro. (a) %	Yearly maintenance cost (b) %	Major rehab/replac. cost (c) %	Span for rehab./replc. (d)				Yearly operation cost (e) %	Uncertainty
Sp	St	ΔS	Remarks																
Water		Bekaa	Physical Stock Number and capacity of treatment plants Number and capacity of reservoirs(m3)	0 61; 15,000	0 38,300 m3	10,650m3 reservoirs for rehabilitation (including 1200 m3 of reservoirs to rehabilitation in: Mdoukha, Khirbit Rouha, Bakka, Elbir, Rachaya, Marj Elzouhour) Pumping stations on Ain Zarqa	On going	1	2	0.32	1	10	10	30%		Low	2		
Water		Bekaa	Length of network (Transmission+Distribution)(km)	285 km (transmission), and 141km (distribution)	300 km (transmission), and 170 km (distribution)	Construction of reservoirs (5250m3)		1	3	1.3	0.19	1	10	10	40%		High	3	
Water		Bekaa				15 km of transmission network for construction		1	3	3.8		1	10	10	30%		High	1	
Water		Bekaa				30 km of distribution network for construction		1	3	2.1		1	10	10	30%		High	1	
Water		Bekaa				Diagnostic study for water supply sector		1	2	0.2			10		50%		Low	1	
Water		Bekaa				Supply with potable water of Package 2 of West Bekaa Caza Loussy System (Drilling of 2 boreholes, construction of 2 regional reservoirs(2000m3 each) Construction of 2 control stations, 96Km of transmission lines and 156Km of distribution lines)		2	6	23.6	0.12	1	10	10	15			Low	3
Water		Bekaa	Institutional Setup Subscriptions number	17,000	47,900														
Water		Bekaa	Number of Staff	55	47,900														
Water		Bekaa	Number of water meters	0		12,000 water meters for installation		2	4	3		1	20	10	15	30%		Low	3
Water		Bekaa				24,000 water meters for installation		6	8	6		1	20	35	15	50%		Low	x
Water		Bekaa				11,900 water meters for installation		14	4	3		1	20	35	15	50%		Low	x
			Management Software	Yes	Yes														
			Economic values:																
			Investment (a)	17.6	37														
			Land value / expropriation (a')	3.8	4														
			Yearly maintenance cost (b)	1.7%	1%														
			Major rehab/replac. cost (c)	13%	10%														
			Span for rehab/replc (d)	29	40														
			Yearly operation cost (e)	0%	12														
			Performance Indicators:																
			Results																
			Actual quantity of water demand (m3/day)/Actual quantity of exploited resources(m3/day)	33,000/33,000															
			Future quantity of water demand (m3/day)(horizon 2020)/Actual quantity of exploited resources(m3/day)	47,900/33,000	Equal or less than 1														
			Number of supply hours/day	NA	24														
			Quality of water vs. international norms	NA	Good														
			% of network ages more than 35 years	NA	0														
			Percentage of unaccounted for water (%)	50 % UFW	20%														
			Means																
			Number of staff per 1000 connections	2.2	2														
			Percentage of water metering coverage per water authority (%)	0	100%														
			Collection ratio of fees (%)	41 % (2003)	90%														
			Revenues of water authority(Billions LL)- expenditures of water authority (Billions LL)	2.3-2.3	Equal or more than 0														