

Sector: Wastewater
Sub-Sector / Technically Autonomous Unit (Network, basin, ..): Bekaa Water & Wastewater Establishment

Sector	Sub-sector	Geographic area	Component	Present Situation Sp	Target Situation St	Projects AS	Characteristics										Priority		
							Technical Constraints		Cost					Impact	Uncertainty (High, Medium, Low)				
							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
Waste water		Bekaa	Physical Stock 1. Collection network	Baalbek & Hermel: Baalbek & surrounding sewerage network under construction; Several villages, such as Chmistar & Bednayel are 100% connected; Others have no sewerage networks; Sewer length: 82 km; Estimated investment cost since 1999: US\$ 7 million, most of which is on the STP of Baalbek	Master plan for wastewater (sewage & stormwater) for Assi and upper and middle Litani Basins prepared, including identification of water resources to be protected, establishing priorities & construction schedule, & setting construction standards & workmanship	Master Plan & Feasibility Study for Assi Basin; Master Plan & Feasibility Study for Upper and Middle Litani Basins	Establishing the Administrative set up	2	1	0.5	0	0	0	10	0	50%	Optimization of investment	M	1
Waste water		Bekaa			Wastewater systems for the area South of Baalbek and north of Zahle (Timnine)	Design, tendering, construction, supervision & O&M		2	6	2	0	1	20	50	10	25%	Minimizing pollution risk	M	1
Waste water		Bekaa			Wastewater systems for Hermel	Design, tendering, construction, supervision & O&M	Can proceed immediately for villages listed, others may be identified by the Master Plan.	2	3	4.1	0	1	20	50	10	25%	Improves efficiency of STP	L	1
Waste water		Bekaa			Wastewater systems for Laboue	Design, tendering, construction, supervision & O&M	Can proceed immediately for villages listed, others may be identified by the Master Plan.	2	2	2.5	0	1	20	50	10	25%	Improves efficiency of STP	L	1
					Direct discharge of raw sewage into water stream abolished and diverted to STPs	Included elsewhere											Reduces O&M & replacement costs		
Waste water		Bekaa			Network deficiencies (capacity, settlement, leakages) solved	Upgrading all existing networks. It requires a land use survey, a detailed house connection survey to identify sewage and stormwater connections, developing options for stormwater collection, network capacity simulation, & regular O&M	Considered part of the O&M of the networks. However, the Establishment should enforce the standard construction details.	2	4	1	0	1	20	50	10	50%	Reduces malfunctions	M	3
					Adequate construction standards & workmanship established	Included elsewhere											Improves efficiency of STP		
Waste water		Bekaa			Collectors constructed within river beds replaced	Design, tendering, construction, supervision & O&M		2	2	2	0	1	20	50	10	50%	Reduces O&M & replacement costs	M	1

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Waste water		Bekaa		Zahle & surroundings 75% of population connected to sewerage network; Raw sewage is disposed in rivers and streams; Main collectors are constructed within river beds; Sewer length: 112 km; Estimated investment cost US\$ 27 million of which 74% are for new works (on-going construction of STP)	Master plan for Upper and Middle Litani Basins (refer to Baalbek above), including identification of water resources to be protected, industrial wastewater management, establishing priorities & construction schedule, & setting construction standards & workmanship	Master Plan & Feasibility Study for Upper and Middle Litani Basin	Establishing the Administrative set up	2	1	0.5	0	0	0	10	0	50%	Optimization of investment	M	1
Waste water		Bekaa		Tender documents completed; awaiting funding	Rehabilitation, upgrading and extension of the sewerage and stormwater networks of Anjar - Majdel Anjar system and surroundings	Tendering, construction, supervision & O&M		1	3	5	0	1	20	50	10	50%	Minimizing pollution risk; Minimizing pollution risk; Reduces malfunctions; Improves efficiency of STP; Reduces O&M & replacement cost	M	1

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Waste water		Bekaa		Chamsine (West Beqaa & upper Rachaya): 50% of population connected; Raw sewage discharged into rivers and streams; Main collectors constructed within river beds; Sewer length: 99 km; Estimated investment cost US\$ 24 million, of which 95% are for rehabilitation, upgrading and extension of sewage and storm networks of 3 systems out of a total of 8 systems	Master plan for Middle Litani Basin updated (refer to Baalbek), including identification of water resources to be protected, industrial wastewater management, establishing priorities & construction schedule, defining flood protection areas & setting construction standards & workmanship	Master Plan & Feasibility Study for Middle Litani Basin (refer to Baalbek)	Establishing the Administrative set up	2	1	0.5	0	0	0	0	0	50%	Optimization of investment	M	1
Waste water		Bekaa			Rachaya collection network completed & operational	Tendering, construction, supervision & O&M	Feasibility study & detailed design required	3	3	1.5	0	1	20	50	10	25%	Minimizing pollution risk	L	3
Waste water		Bekaa			Qaraoun collection network completed & operational	Tendering, construction, supervision & O&M		1	3	1.3	0	1	20	50	10	25%	Minimizing pollution risk	L	1
Waste water		Bekaa		Villages downstream the Qaraoun dam having collection networks are discharging into the river	Collection network designed, constructed & operational	Design and feasibility study		2	1	0.5						50%	Minimizing pollution risk	L	1
			2. Treatment Plants																
Waste water		Bekaa		Baalbek & Hermel: STP constructed in 2000 for a capacity of 12,5000 m ³ /d to serve a population of about 75,000 but not operational. Investment cost US\$ 15 million	STP operational and effluent reused for irrigation	O&M and upgrading to tertiary treatment				0.7						50%	Reduces pollution; Provides additional water resources for irrigation	L	1
Waste water		Bekaa			Hermel STP constructed, operational and effluent reused for irrigation	Design, tendering, construction, supervision & O&M		3	2	6.1	0.5	2	20	50	15	25%	Reduces pollution; Provides additional water resources for irrigation	M	1
Waste water		Bekaa			Timnine STP constructed, operational and effluent reused for irrigation	Design, tendering, construction, supervision & O&M		2	2	7	0.5	2	20	50	15	50%	Reduces pollution; Provides additional water resources for irrigation	M	1
Waste water		Bekaa			Laboue STP constructed, operational & effluent reused for irrigation	Design, tendering, construction, supervision & O&M		2	2	2	0.5	2	20	50	15	50%	Reduces pollution; Provides additional water resources for irrigation	M	1
Waste water		Bekaa		Chamsine (West Beqaa & upper Rachaya): Qaraoun STP under construction	Qaraoun STP constructed, operational and effluent reused for irrigation,	O&M , tendering, construction & supervision		1	2	3.7	0.5	2	20	30	15	50%	Reduces pollution; Provides additional water resources for irrigation	L	1

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Waste water		Bekaa			Marj STP constructed, operational and effluent reused for irrigation (Anjar, Majdel Anjar system)	Tendering, construction, supervision & O&M		2	2	15	0.5	2	20	30	15	50%	Reduces pollution; Provides additional water resources for irrigation	L	1
Waste water		Bekaa			Rachaya STP constructed, operational and effluent reused for irrigation,	Tendering, construction, supervision & O&M	Feasibility study & detailed design required	2	2	3.5	0.5	2	20	30	15	50%	Reduces pollution; Provides additional water resources for irrigation	M	3
Waste water		Bekaa	Institutional Setup	Todate, municipalities are still in charge of the sector. However, because of their inadequate capabilities and administrative shortage, CDR contracted out the O&M of the Ghadir plant. Payment to the contractor is made from the Municipalities Fund	Government continues supporting the capital investment of wastewater projects; Water Establishment funds O&M	Constitution of the Wastewater Department within the Establishment	Resolving governmental decision concerning staff hiring and salaries	1	2	1.5	0	0	0	0	0	50%	Optimization operation	L	1
Waste water		Bekaa		Legally, the Bekaa Establishment is responsible for the sector, however the Establishment has neither the experience nor the administrative setup and required staff	Administrative setup in Water Establishment established for project management & monitoring; Services for O&M are either by the Establishment or by specialized firms.	Technical assistance, training & capacity building for staff to take over full responsibility of the sector, project identification, tendering, procurement, project management & monitoring, supervision, & O&M, public awareness campaign for all stakeholders to adopt, apply & monitor application of construction standards and workmanship		2	1	1.5	0	0	0	10	0	50%	Optimization of investment and O&M cost	L	1
			Economic values:																
			Investment (a)	73	207														
			Land value / expropriation (a')	3	2														
			Yearly maintenance cost (b)	1.4%	0.8%														
			Major rehab/replac. cost (c)	16.4%	1%														
			Span for rehab/replc (d)	5	40														
			Yearly operation cost (e)	12%	9%														
			Performance Indicators:																
			Results																
			Low % of polluted water resources																
			Volume of TSE available for irrigation & landscape irrigation																
			Means																
			Coverage of collection network																
			% of sewerage treated																
			Capabilities of Establishment																
			Number of employees per 1000 connections																