

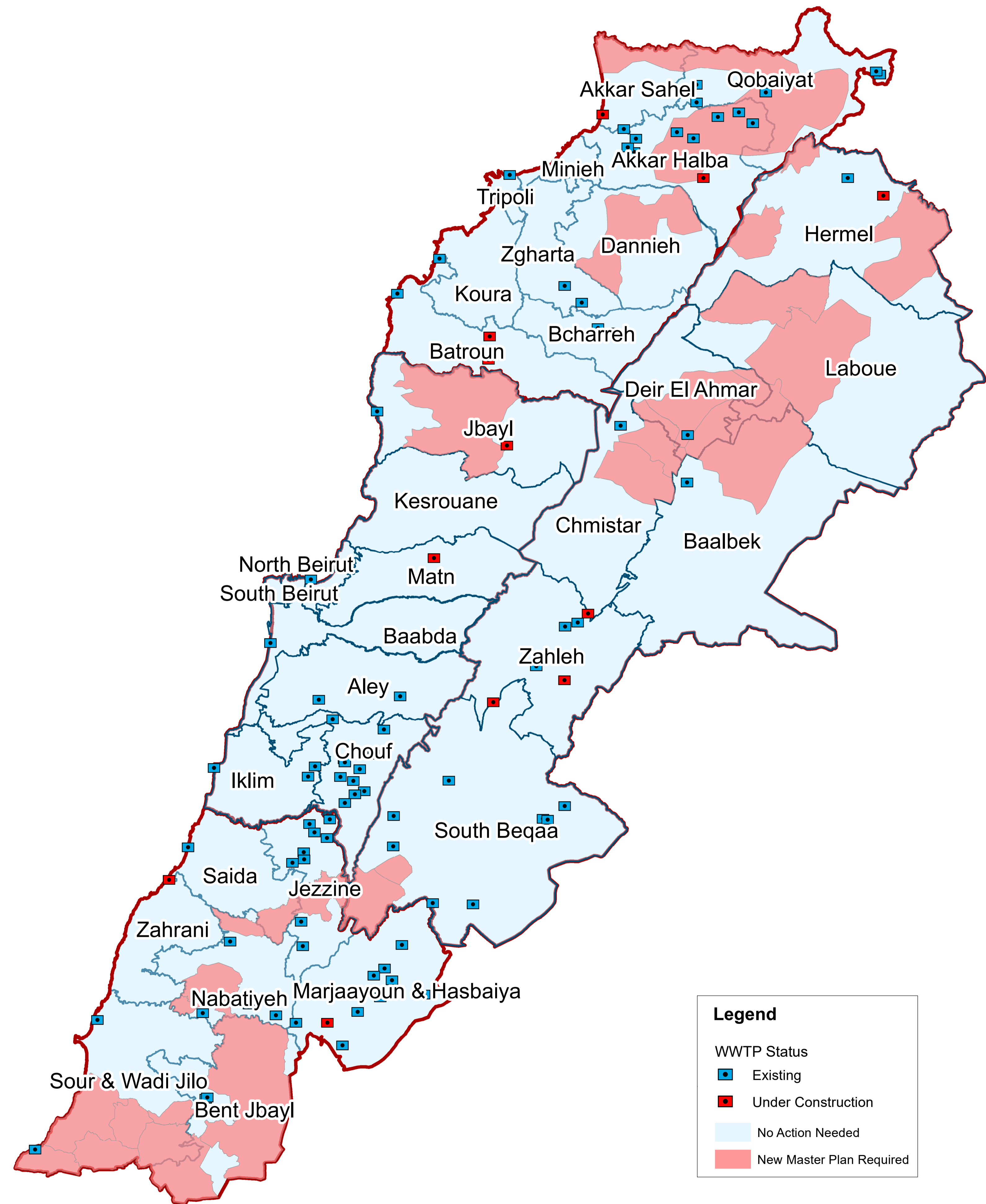


EU-AFD TECHNICAL ASSISTANCE PROGRAMME TO SUPPORT REFORMS IN THE WATER AND WASTEWATER SECTORS IN LEBANON



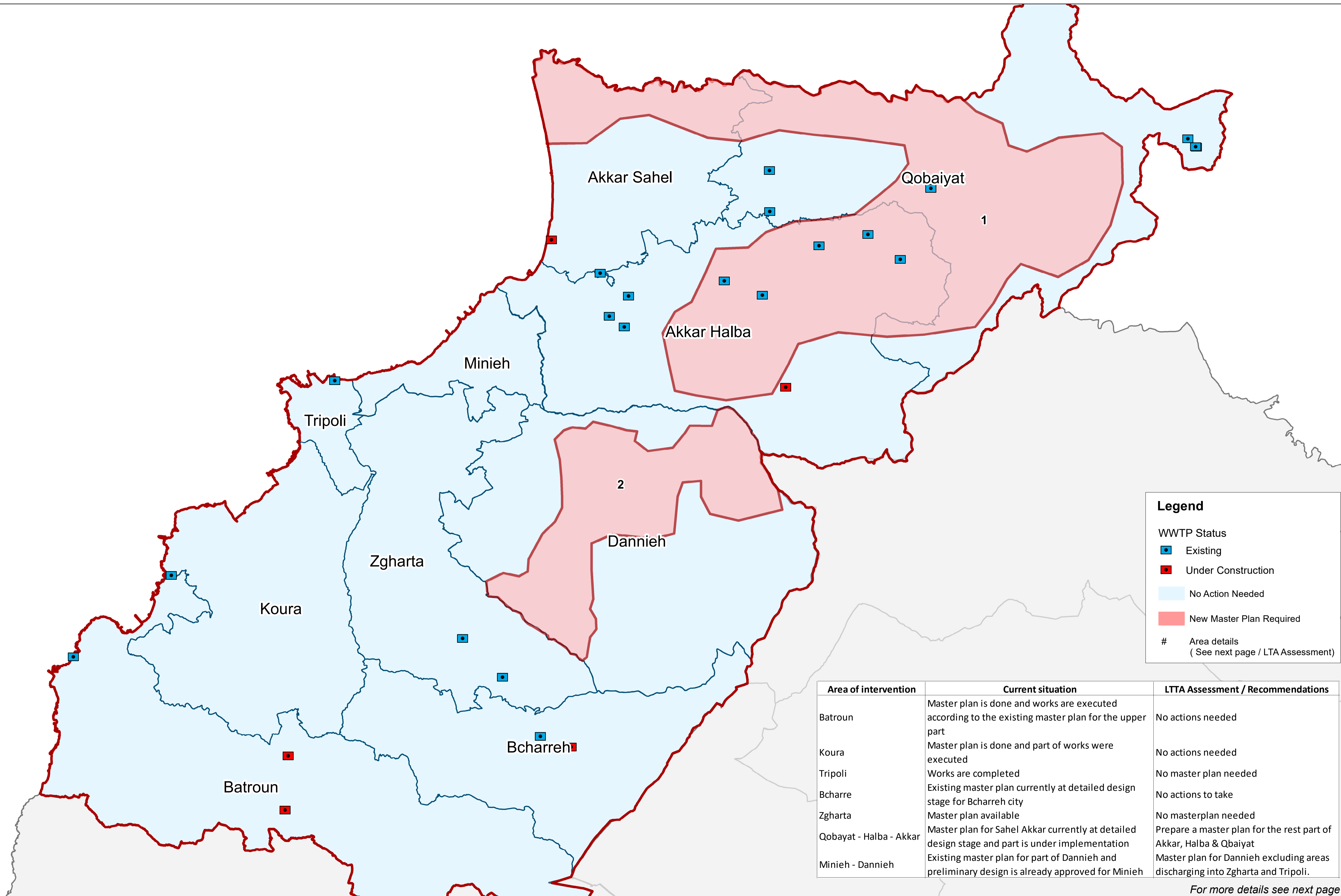
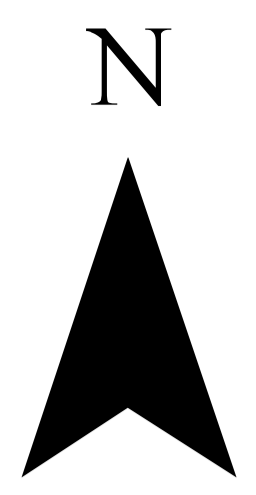
WASTEWATER MASTER PLANS STATUS & PROPOSED ACTION

May 2023



Legend

- WWTP Status
- Existing
- Under Construction
- No Action Needed
- New Master Plan Required



Legend

WWTP Status

- Existing
- Under Construction

No Action Needed

New Master Plan Required

Area details
(See next page / LTA Assessment)

Area of intervention	Current situation	LTTA Assessment / Recommendations
Batroun	Master plan is done and works are executed according to the existing master plan for the upper part	No actions needed
Koura	Master plan is done and part of works were executed	No actions needed
Tripoli	Works are completed	No master plan needed
Bcharre	Existing master plan currently at detailed design stage for Bcharreh city	No actions to take
Zgharta	Master plan available	No masterplan needed
Qobayat - Halba - Akkar	Master plan for Sahel Akkar currently at detailed design stage and part is under implementation	Prepare a master plan for the rest part of Akkar, Halba & Qbaiyat
Minieh - Dannieh	Existing master plan for part of Dannieh and preliminary design is already approved for Minieh	Master plan for Dannieh excluding areas discharging into Zgharta and Tripoli.

For more details see next page



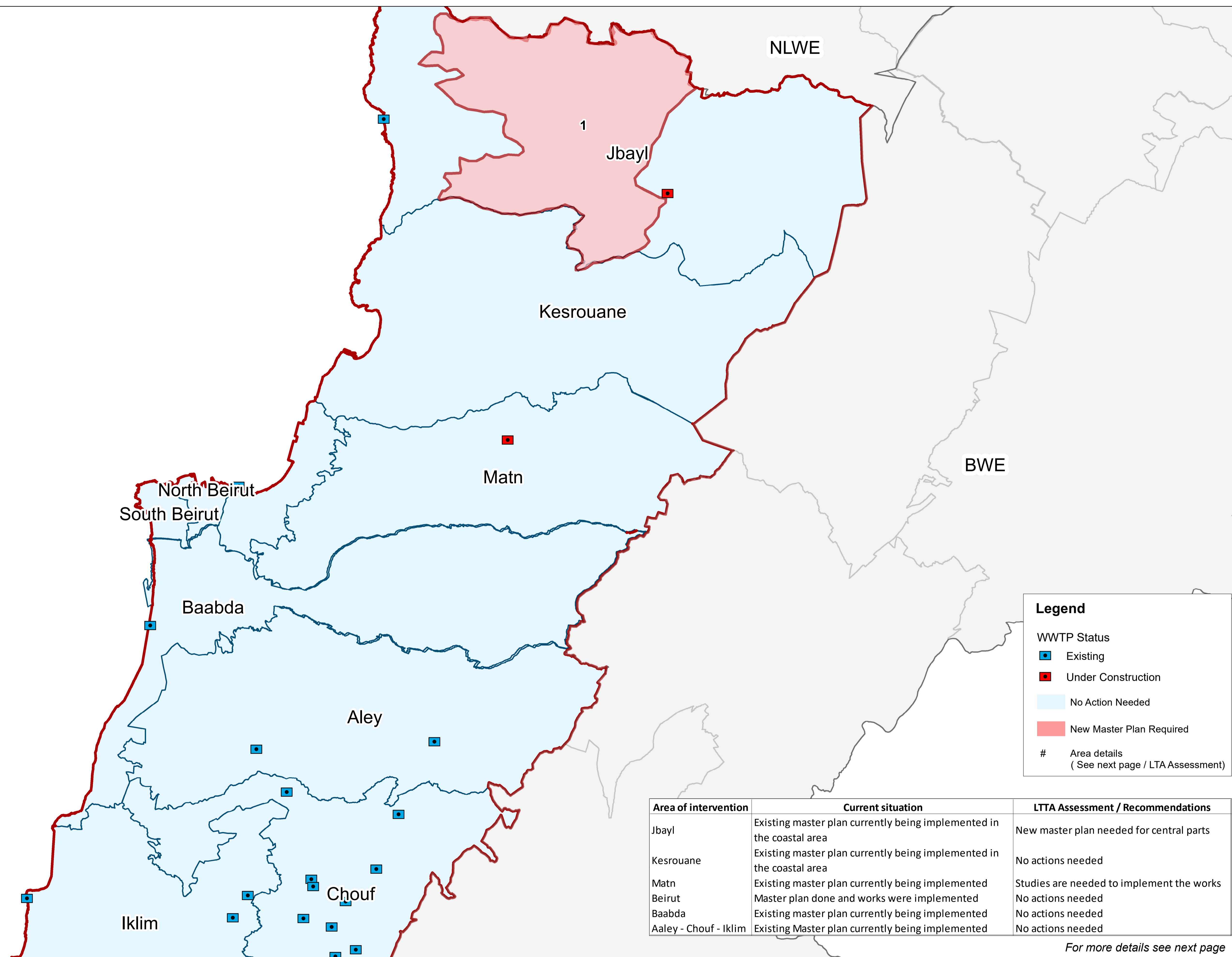
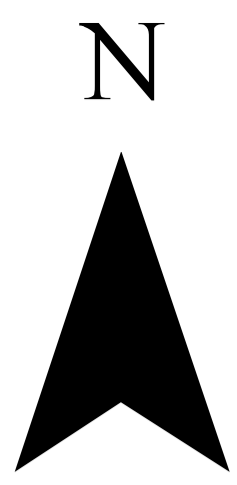
EU-AFD TECHNICAL ASSISTANCE PROGRAMME TO SUPPORT REFORMS IN THE WATER AND WASTEWATER SECTORS IN LEBANON

WASTEWATER MASTER PLANS STATUS & PROPOSED ACTION

NLWE



	Master Plan 1	Master Plan 2	Master Plan 3	Master Plan 4	Master Plan 5	Master Plan 6	Master Plan 7
Covered area							
Casa	Southern area	Southern area	Tripoli	Southern area	Northern area - Akkar	Southern area	Northern area
District	Batroun	Koura	Tripoli	Bcharre	Qobayat - Halba - Akkar	Zgharta	Minieh - Dannieh
Nbr of localities	73	49	9	25	158	47	49
Covered population (2020)	69,235	152,984	519,122	47,895	689,694	124,423	232,008
Nbr of subscribers to the WE (2019)	12,022	15,203	59,862	3583	16189	10617	13079
Nbr connected to the sewer (2019)	2,533	2,535	18,449				
Collection networks							
Nbr of Waste Water systems	9	7	1	24	18	4	1
Total length of network	215.2 km Existing 372.8 km Proposed	157.4 km Existing 15.4 km Under construction 124.3 km Proposed	80.88 km Existing 40.4 km Under Construction 164.3 km Proposed		100.5 km Existing 245 km Under Construction 928.6 km Proposed	60.9 km Existing 192.4 km Proposed	155.8 km Existing 161.8 km Proposed
Treatment plants							
Nbr of WWTP (Ex, UC, Planned or designed)	10	7	1	25	18	7	1
WWTP (Ex, UC, Planned or Designed)	2 Existing (Chekka, Selaata) 6 Planned (Madfoun, Jrabta, Dahr Abi Yaghi, Ram, Kfar Hay, Chabtine) 2 Under Construction (Kfar Halda, Bcheaali)	1 Existing (Chekka) 6 Planned (Kaftoune, Btaaboura, Dar Bechmazzine, Ajed Ebrine, Kalhat, Bnehrene)	1 Existing (Tripoli WWTP)	1 Existing (Bcharre Reed bed) 23 Planned (Abdine, Qnat, Beit Mounzer, Hadath Al Joubbeh, Breissat, Mazraat Bani Saab, Mazraat Assaf, Billa, Bane, Hasroune, Baazoune, Bqerqasha, Bqaa Kafra, Berhalliounne, Dimane, Blaouza, Hadchite 1, Moghr El Aoual, Qnayouer, Tourza, Hadchite 2, Kanyour, Matrite) 1 Under Construction (Bcharre)	16 Existing (Homeira, Majdla, Bqarezle, Rahbe, Jebrayel, Zouq El Mqachrine, Akkar El Atika, Beino, Daoura, Mazraat Balde, Qbayat, Charbilia, Knaisse 1, Knaisse 2, Machta Hammoud, Hnaider) 2 Under Construction (Michmich, El Aabde)	3 Existing (Tripoli, Ehdn 1, Ehdn 2) 4 Planned (Kfarsghab, Bouhairat Toula, Aslout, Arbet Koshaya)	1 Existing (Tripoli)
Treatment Technology(ies)	Activated sludge, Conventional Activated Sludge (CAS) with Oxidation Ditch (DO) with N removal	Activated sludge, Trickling filter, Wetland	Activated sludge	Reed bed, Activated sludge, Wetland, Rotating Biological Contractors (RBC)	Trickling Filter, Secondary treatment plant, Up_Flow Anaerobic Sludge Blanket UASB Technology, Activated Sludge, Wetland, Advanced Septic Tank, MBBR	Activated sludge, Trickling filter, Wetland, Conventional Activated Sludge, tertiary chlorination and membrane filtration	Activated sludge
Effluent Discharge (Coastal/Inland)	Coastal & Inland						
Use	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater
Project Holder (CDR, MoEW, WEs)	MoEW, NLWE	MoEW, NLWE	MoEW, NLWE	MoEW, NLWE	MoEW, NLWE	MoEW, NLWE	MoEW, NLWE
Consultant	KREDO	KREDO	KREDO	KREDO	KREDO	KREDO	KREDO
Description and Scope of works	<p>The Wastewater Systems Master Plan for the Mohafazat of South and Nabatieh aims to produce a unified and final masterplan that can be used by the decision makers at the MEW and the North Lebanon Water Establishment (NLWE) in the preparation of a rationale infrastructure development and capital investment plan for wastewater collection and wastewater treatment systems.</p> <p>The scope of works includes the following tasks: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2050 horizon. - Assess the existing main wastewater infrastructures, and collect and study all reports, designs, and proposed masterplans. - Develop alternative recommended improvements to the wastewater systems in the service areas. - Prepare an action plan with capital cost estimates for each proposed capital investment.</p> <p>All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and cazas.</p>	<p>The Wastewater Systems Master Plan for the Mohafazat of Akkar and the North aims to produce a unified and final masterplan that can be used by the decision makers at the MEW and the North Lebanon Water Establishment (NLWE) in the preparation of a rationale infrastructure development and capital investment plan for wastewater collection and wastewater treatment systems.</p> <p>The scope of works includes the following tasks: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2050 horizon. - Assess the existing main wastewater infrastructures, and collect and study all reports, designs, and proposed masterplans. - Develop alternative recommended improvements to the wastewater systems in the service areas. - Prepare an action plan with capital cost estimates for each proposed capital investment.</p> <p>All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and cazas.</p>	<p>The Wastewater Systems Master Plan for the Mohafazat of Akkar and the North aims to produce a unified and final masterplan that can be used by the decision makers at the MEW and the North Lebanon Water Establishment (NLWE) in the preparation of a rationale infrastructure development and capital investment plan for wastewater collection and wastewater treatment systems.</p> <p>The scope of works includes the following tasks: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2050 horizon. - Assess the existing main wastewater infrastructures, and collect and study all reports, designs, and proposed masterplans. - Develop alternative recommended improvements to the wastewater systems in the service areas. - Prepare an action plan with capital cost estimates for each proposed capital investment.</p> <p>All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and cazas.</p>	<p>The Wastewater Systems Master Plan for the Mohafazat of Akkar and the North aims to produce a unified and final masterplan that can be used by the decision makers at the MEW and the North Lebanon Water Establishment (NLWE) in the preparation of a rationale infrastructure development and capital investment plan for wastewater collection and wastewater treatment systems.</p> <p>The scope of works includes the following tasks: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2050 horizon. - Assess the existing main wastewater infrastructures, and collect and study all reports, designs, and proposed masterplans. - Develop alternative recommended improvements to the wastewater systems in the service areas. - Prepare an action plan with capital cost estimates for each proposed capital investment.</p> <p>All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and cazas.</p>	<p>The Wastewater Systems Master Plan for the Mohafazat of Akkar and the North aims to produce a unified and final masterplan that can be used by the decision makers at the MEW and the North Lebanon Water Establishment (NLWE) in the preparation of a rationale infrastructure development and capital investment plan for wastewater collection and wastewater treatment systems.</p> <p>The scope of works includes the following tasks: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2050 horizon. - Assess the existing main wastewater infrastructures, and collect and study all reports, designs, and proposed masterplans. - Develop alternative recommended improvements to the wastewater systems in the service areas. - Prepare an action plan with capital cost estimates for each proposed capital investment.</p> <p>All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. 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Detailed cost estimates were developed by project components, types of work and cazas.</p>	<p>The Wastewater Systems Master Plan for the Mohafazat of Akkar and the North aims to produce a unified and final masterplan that can be used by the decision makers at the MEW and the North Lebanon Water Establishment (NLWE) in the preparation of a rationale infrastructure development and capital investment plan for wastewater collection and wastewater treatment systems.</p> <p>The scope of works includes the following tasks: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2050 horizon. - Assess the existing main wastewater infrastructures, and collect and study all reports, designs, and proposed masterplans. - Develop alternative recommended improvements to the wastewater systems in the service areas. - Prepare an action plan with capital cost estimates for each proposed capital investment.</p> <p>All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and cazas.</p>
Status	Completed	Completed	Completed	Completed	Completed	Completed	Completed
Time frame							
Start date	2015	2015	2015	2015	2015	2015	2015
End date/Duration	2016	2016	2016	2016	2016	2016	2016
Additional Info	In addition to Kredon master plan, other studies for wastewater in this area were prepared also to implement the works. It should be noted that the data are from the most updated studies and the updated NWSS 2020.	In addition to Kredon master plan, other studies for wastewater in this area were prepared also to implement the works. It should be noted that the data are from the most updated studies and the updated NWSS 2020.	In addition to Kredon master plan, other studies for wastewater in this area were prepared also to implement the works. It should be noted that the data are from the most updated studies and the updated NWSS 2020.	In addition to Kredon master plan, A feasibility study was prepared for the wastewater systems at the charre caza. The works. It should be noted that the data are from the most updated studies and the updated NWSS 2020. Feasibility study available, prepared by other consultants.	In addition to Kredon master plan, detailed design were prepared for the areas Sahel 1, 2 and 3, Mechmech, In addition to Kredon master plan, other studies for wastewater in this area were prepared also to implement the works. It should be noted that the data are from the most updated studies and the updated NWSS 2020.	No additional studies were made to implement the planned wastewater water systems. It should be noted that the data are from the most updated studies and the updated NWSS 2020.	In addition to the master plan, a feasibility study was prepared by WET and ELARD to implement the planned wastewater systems. It should be noted that the data are from the most updated studies and the updated NWSS 2020.
LTA Assessment	Current Situation: Works are under construction in upper Batroun (Kfarhelda), master plan available for lower part. Recommendations: No action are needed in terms of Master planning. Detailed design are required to implement the wastewater systems for the lower part.	Current Situation: Master plan done. A part of works were executed. Recommendations: No action needed. Detailed design are needed for the remaining works.	Current Situation: Some works are under construction. Recommendations: No need for a master plan	Current Situation: Master plan and feasibility study are available. Works are under construction for the Bcharre city.. Recommendations: No master plan needed. Detailed design are required for the areas outside the bcharre city.	Current Situation: Master plan is done and works are under execution for Area Sahel 1, 2, and 3. The master plan and the feasibility studies for the remaining part of Akkar must be revised. Recommendations: The master plan must be revised for the parts outside Sahel 1,2&3, Mechmech, ... Areas & Localities in need to master plan: Area (1) Villages: Qabbait, Habchite, Danbou, Chane, El Houaiche, Khreibet Akkar, Harare, Sadaka, Beit Younes, Beit Ayoub, El Korne, El Krayat, Mimnih, Jebrayel, Dahr-Leyciné, Rahbé, Tikrite, Beit Mallat, Tallé et Chattaha, El Ayounne, Bazbina, Ain Yacoub, Chakdouf, El Borge, Kboula, Beino, Late, Daoura, Akkar El Atika, Qatlabé, Andeket, El Koubayet, Majdel, Fseikine et Ain Achma, Kherbet Char, Barbara, Douair Adouiyé, Ain Tanta, Sindianet Zeidan, El Bardé, Mazraet El Nahrieh, Chikhlar, Rmah, Kfarnoune, Mounjez, Freidice, Charkié, Dabbabiyé, Noura El Faouka, Noura El Tahta, El Armeh, Kachlak, Srar, Deirine, Janine, Al Kharnoubé, Barcha, Cheir Homeirine, Joret Srar, Al Abboudiyé, Tal Homeira, Tal Biré, Al Kneissé, Hekr El Dahiri, Al Semmakie, Arida, Al Moghrak, Cheikh Zenad Tal Biré, Al Kleiat, Saadine, Akroum, Kfar Toun, Mrah, Khaoukh, Sahle.	Current Situation: Master plan done. Recommendations: Detailed design is required.	Current Situation: Preliminary design for Minnieh done. Detailed design is required. Recommendations: Master plan for Dannieh excluding areas discharging into Zgharta and Tripoli. Areas & Localities in need to master plan: Area (2) Villages: Qemmamine, Mazraet El Kreine, Jaroun, Kfar Bibnine, Hawara, Assaymout, Qarhaiya, Debaael, Beit Haouik, Karsela, El Hazmieh, Ain El Tiné, Beit El Faks, Al Sfiré, Tarane, Mrah El Sfiré, Qraine, Kattiné, Assoun, Sir, Haql El Aazimé, Kharnoub, Bakhounne, El Watié, Harf Siad, Btermaz, Btehlina, Bchnnata, Behweité



Legend

WWTP Status

- Existing
- Under Construction
- No Action Needed
- New Master Plan Required

Area details
(See next page / LTA Assessment)

Area of intervention	Current situation	LTA Assessment / Recommendations
Jbayl	Existing master plan currently being implemented in the coastal area	New master plan needed for central parts
Kesrouane	Existing master plan currently being implemented in the coastal area	No actions needed
Matn	Existing master plan currently being implemented	Studies are needed to implement the works
Beirut	Master plan done and works were implemented	No actions needed
Baabda	Existing master plan currently being implemented	No actions needed
Aley - Chouf - Iklm	Existing Master plan currently being implemented	No actions needed

For more details see next page



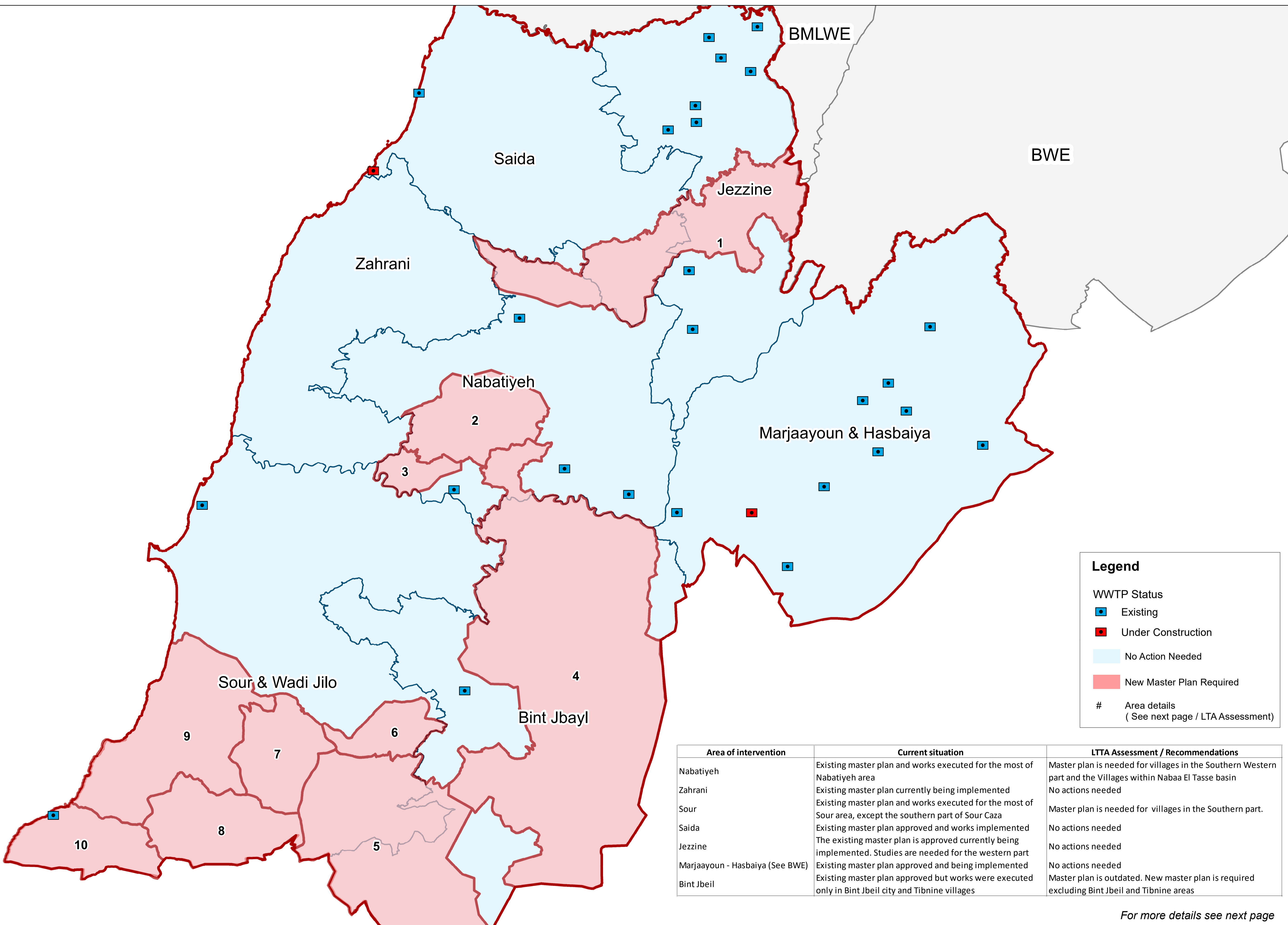
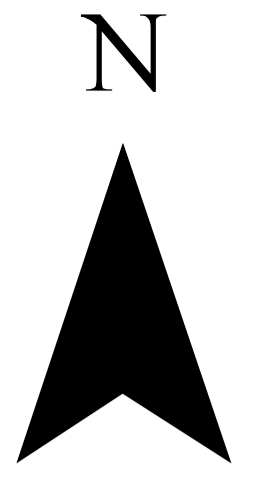
EU-AFD TECHNICAL ASSISTANCE PROGRAMME TO SUPPORT REFORMS IN THE WATER AND WASTEWATER SECTORS IN LEBANON

WASTEWATER MASTER PLANS STATUS & PROPOSED ACTION

BMLWE



	Master Plan 1	Master Plan 2	Master Plan 3	Master Plan 4	Master Plan 5	Master Plan 6
Covered area						
District/casa	Jbayl	Kesrouane	Upper Matn/Costal Matn	Beirut	Baabda-Aaley	Chouf - Klim
Nbr of localities	133	78	88/24	12	231	
Nbr of subscribers to the WE (2020)	20,088	56,476	133,805	73,644	103,150	
Nbr connected to the sewer (2020)						113,500 (All)
Collection networks						
Nbr of Waste Water systems	5	4	11	2	7	20
Total length of network						
Collection networks						
Nbr of WWTP (Ex, UC, Planned or designed)	5	4	11	2	8	21
WWTP (Ex, UC, Planned or Designed)	1 Existing (Jbayl WWTP) 1 Under construction (Qartaba WWTP) 3 Planned (Lassa, Hdeine, Korkraya)	4 Planned (Ghazir-Adma, Achqout, Hrajel, Makhada WWTP)	1 Existing to Bourj Hammoud WWTP 9 Planned (El Halaliyeh, El Abadiyeh, El Kneissé, Hasbaiya, Kartada, Abou Mizane, Es Souane, Mchikha, Zabbougha WWTP) 1 Under construction (Khouchara WWTP)	2 Existing (*Ghadir and Borj Hammoud WWTP) * Ghadir WWTP served Beirut and Baabda-Aaley districts	3 Existing (*Ghadir and Nabaa El Safa , Rimahala WWTP) 5 Planned (Bchetfine, Bou zridé, Chourit, Aghmid, Bhamdoun WWTP) * Ghadir WWTP served Beirut and Baabda-Aaley districts	15 Existing (Ras Nabi Younes, KfarKatra, Barouk, Maasser El Chouf, El Jdeidé, El Moukhtara, Ainbal, Gharifé, Ammatour, El Khreibé, Baadarane, Mristé, Jebah, Bater, Nabaa El Safa WWTP) 6 Planned (Bkifa, Deir Baba, El Fouara, Mazraet El Chouf, Mazraet El Mekhtaram, Sirjbal WWTP)
Treatment Technology(ies)	Biofilters	Activated sludge	Activated sludge		Extended aeration activated sludge	Activated sludge , trickling filter
Effluent Discharge (Coastal/Inland)	Coastal and Inland	Coastal and Inland	Coastal and Inland	Coastal	Coastal and Inland	Coastal and Inland
Use	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater
Project Holder (CDR, MoEW, WEs)	BMLWE, MoEW	BMLWE, MoEW	BMLWE, MoEW	BMLWE, MoEW	BMLWE, MoEW	BMLWE, MoEW
Consultant	Internally prepared by MoEW	Internally prepared by MoEW	Internally prepared by MoEW	Internally prepared by MoEW	Internally prepared by MoEW	Internally prepared by MoEW
Description and Scope of works	The Wastewater Systems Master Plan for the Mohafazat of Beirut and Mount Lebanon aimed to: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2040 horizon. - Assess the existing main wastewater infrastructures, - List the recommended improvements and define the required wastewater systems in the service areas	The Wastewater Systems Master Plan for the Mohafazat of Beirut and Mount Lebanon aimed to: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2040 horizon. - Assess the existing main wastewater infrastructures, - List the recommended improvements and define the required wastewater systems in the service areas	The Wastewater Systems Master Plan for the Mohafazat of Beirut and Mount Lebanon aimed to: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2040 horizon. - Assess the existing main wastewater infrastructures, - List the recommended improvements and define the required wastewater systems in the service areas	The Wastewater Systems Master Plan for the Mohafazat of Beirut and Mount Lebanon aimed to: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2040 horizon. - Assess the existing main wastewater infrastructures, - List the recommended improvements and define the required wastewater systems in the service areas	The Wastewater Systems Master Plan for the Mohafazat of Beirut and Mount Lebanon aimed to: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2040 horizon. - Assess the existing main wastewater infrastructures, - List the recommended improvements and define the required wastewater systems in the service areas	The Wastewater Systems Master Plan for the Mohafazat of Beirut and Mount Lebanon aimed to: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2040 horizon. - Assess the existing main wastewater infrastructures, - List the recommended improvements and define the required wastewater systems in the service areas
Status	Completed	Completed	Completed	Completed	Completed	Completed
Time frame						
Start date	NA (Latest MP found)	NA (Latest MP found)	NA (Latest MP found)	NA (Latest MP found)	NA (Latest MP found)	NA (Latest MP found)
End date/Duration	NA (Latest MP found)	NA (Latest MP found)	NA (Latest MP found)	NA (Latest MP found)	NA (Latest MP found)	NA (Latest MP found)
Additional Info	In addition to the master plan, other studies for wastewater in the coastal area of Jbayl were prepared also to implement the works. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the master plan, studies for wastewater systems were also made for the implementation of works. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the master plan, studies for wastewater systems were also made for the implementation of works in the coastal Matn and few areas in the upper Matn. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	Works are completed. Studies are needed for upgrades and rehabilitation. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the master plan, studies for wastewater systems were also made for the implementation of works in the coastal and upper Chouf areas. Some areas still need to studies to implement the wastewater systems. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the master plan, studies for wastewater systems were also made for the implementation of works in the coastal and upper Chouf areas. Some areas still need to studies to implement the wastewater systems. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)
LTTA Assessment	Current Situation: A master plan is being implemented for the coastal area. Recommendations: New master plan is needed for the central parts of Jbayl. Areas & Localities in need to master plan: Area (1) Villages : Maad, Ain Kfah, Bejjé, Ghalboune, Hsarate Et Richkif, Chamate, Beit Habbak, El Ramout, Sakiet El Kheite, Obeidate, El Kharbé, Haqel, Maifouk, Lehfed, Al Kattara, Tartige, Jage, Saki Rechmaya, Mechmech, Habil, El Kfoune, Behdaidate, El Kafr, El Harf, Berket Hejoula, Hejoula, Kfarbaal, Torzaya, Almate El Chemaliat, Mazraat El Maaden, Ehmej, Mazraet El Siyad, Bchillé, Jouret El Kattine, Zebdine, El Hsoune, Bazoune, Farhat, El Souané, Ain El Delbé, Frat, Aimate El Jenoubiat, Belhos, Bezhel, Fatré, Bir El Haiit, Adonis, Sannour, Mechane, Ain Jraine, Yahchouche, Korkraya, Janné, Kehmez, Aarasta, Ghabate, Sarhita, Afka, El Mejdel, Yanouh, El Mghairé, Tedmor Et Serghal, Deir Mar Sarkis, Kartaba, Hedayné,	Current Situation: Master plan done. Studies are still needed to implement the wastewater systems. Recommendations : No master plan is needed. There is a need for additional advanced studies.	Current Situation: Master plan done. Studies are still needed to implement the wastewater systems in the upper Matn. Recommendations : No master plan is needed. There is a need for additional advanced studies to implement the works in the upper Matn.	Current Situation: Works were implemented. Studies are still needed to upgrade and rehabilitate the existing wastewater systems. Recommendations : No master plan is needed. There is a need for additional advanced studies to implement the works in the upper Matn.	Current Situation: Master plan is done and part of works are completed. Studies are still needed to implement the remaining wastewater systems. Recommendations : No master plan is needed. There is a need for additional advanced studies to implement the remaining wastewater systems, upgrade and rehabilitate the existing ones.	Current Situation: Master plan is done and works are completed for a part of Chouf. Studies are still needed to implement the remaining wastewater systems. Recommendations : No master plan is needed. There is a need for additional advanced studies to implement the remaining wastewater systems, upgrade and rehabilitate the existing ones.



Legend

WWTP Status

- Existing
- Under Construction
- No Action Needed
- New Master Plan Required

Area details
(See next page / LTA Assessment)

Area of intervention	Current situation	LTA Assessment / Recommendations
Nabatiyeh	Existing master plan and works executed for the most of Nabatiyeh area	Master plan is needed for villages in the Southern Western part and the Villages within Nabaa El Tasse basin
Zahrani	Existing master plan currently being implemented	No actions needed
Sour	Existing master plan and works executed for the most of Sour area, except the southern part of Sour Caza	Master plan is needed for villages in the Southern part.
Saida	Existing master plan approved and works implemented	No actions needed
Jezzine	The existing master plan is approved currently being implemented. Studies are needed for the western part	No actions needed
Marjaayoun - Hasbaiya (See BWE)	Existing master plan approved and being implemented	No actions needed
Bint Jbeil	Existing master plan approved but works were executed only in Bint Jbeil city and Tibnine villages	Master plan is outdated. New master plan is required excluding Bint Jbeil and Tibnine areas

For more details see next page



EU-AFD TECHNICAL ASSISTANCE PROGRAMME TO SUPPORT REFORMS IN THE WATER AND WASTEWATER SECTORS IN LEBANON

WASTEWATER MASTER PLANS STATUS & PROPOSED ACTION

SLWE

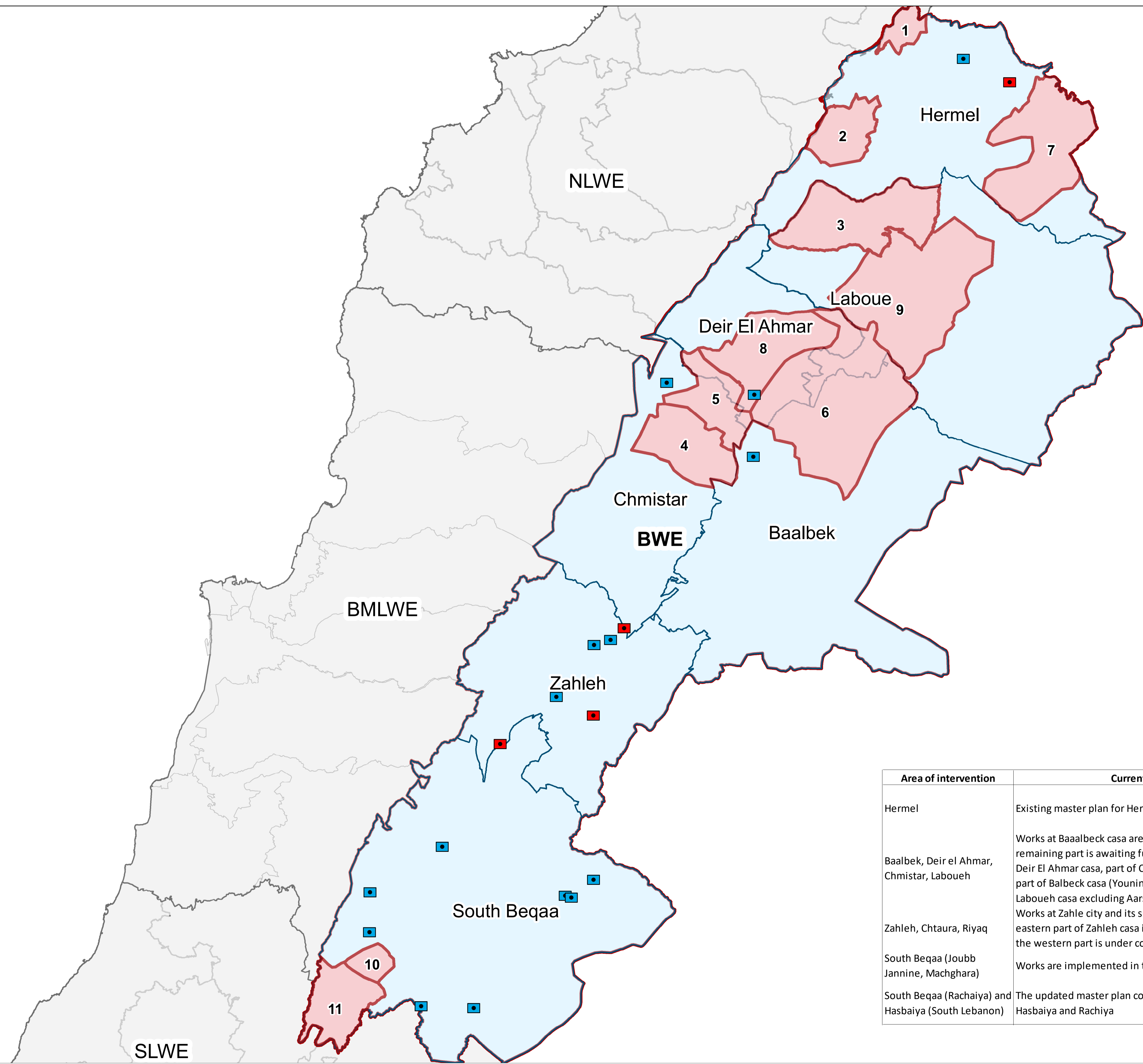
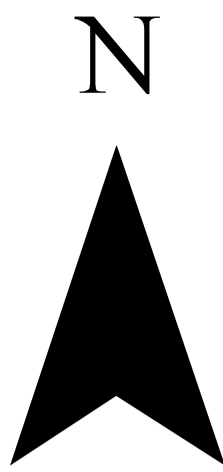


CONSULTANT

Hydroconseil HYDROPHIL

May 2023

	Master Plan 1	Master Plan 2	Master Plan 3	Master Plan 4	Master Plan 5	Master Plan 6	Master Plan 7
Covered area							
District	South Lebanon	South Lebanon	Nabatieh	South Lebanon	South Lebanon	South Lebanon	Nabatieh
Casa	Saida	Nabatieh	Bint Jbeil	Zahrani	Sour	Jezzine	Marjaayoun - Hasbaiya
Nbr of localities	55	27	24	24	28	28	28
Covered population (2020)	331,321	353,109	68,625	216,384	569,101	51,660	101,556
Nbr of subscribers to the WE (2021)	53,701	35,065	29,747	15,129	32,162	6,541	14,220
Nbr connected to the sewer (2021)	48,012	24,275	0	0	0	0	0
Ratio (Sub. Connected/Subscribers)	89%	69%	0%	0%	0%	0%	0%
Collection networks							
Nbr of Waste Water systems	1	4	2	1 Canceled	2	12	10
Total length of network (km)	303 km Existing	201 km Existing	144 km Existing		440 km Existing	195 km Existing	28 km Existing 195 km Under construction
Treatment plants							
Nbr of WWTP (Ex, UC, Planned or designed)	1	4	2	1 Canceled	2	15	14
WWTP (Ex, UC, Planned or Designed)	1 Existing (Sainiq WWTP)	2 Existing (Charqiyé, Zaoutar) 2 Existing not operational (Kfar Sir, Yohmor)	1 Existing (Tibnine WWTP) 1 Planned (Bint Jbeil)	1 Designed (the Construction of the planned WWTP at Sarafand for the Zahrani wastewater system was canceled). The collected wastewater flow will be conveyed to Chabriha WWTP by mains of pumping stations constructed along the coastal area	2 Existing (Chabriha, Borj En Naqoura)	2 Existing (Qaytoulé, Haytoura) 7 Existing not operational (Wadi Jezzine, El Aichye, Bteddine, Dahr Er Ramli, Ghabbatieh, El Rihane, Sanaya) 6 Planned (Bisri, Azour, Roum, Sfaray, Bhannine, Zhilta)	1 Existing (Deir Mimas) 7 Existing not operational (Aain Jarfa, Chebaa, Fardis, Hebbariyé, Kfar Hamam, Meri, Salaiyeb) 5 Planned (Chebaa, Kfar Hamam, Meri, Salaiyeb, Kfar Chouba) 1 Under construction (El Khiam)
Treatment Technology(ies)	Preliminary Treatment	Activated Sludge	NA		Activated sludge	Reed bed, Wetland, Activated sludge, Trickling filter, Aeration tanks, Digestor	Activated Sludge and other technologies are not defined as they are not operational.
Effluent Discharge (Coastal/Inland)	Coastal	Inland	Inland	Coastal	Coastal	Inland	Inland
Use	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater
Project Holder (CDR, MoEW, WEs)	MoEW & SLWE	MoEW & SLWE	MoEW & SLWE	MoEW & SLWE	MoEW & SLWE	MoEW & SLWE	MoEW & SLWE
Consultant	WET	WET	WET	WET	WET	WET	WET
Description and Scope of works	<p>The Wastewater Systems Master Plan for the Mohafazat of the South and the Nabatieh aims to prepare a unified and final masterplan that can be used by the decision makers at the MEW and the South Lebanon Water Establishment (SLWE) in the preparation of a rationale infrastructure development and capital investment plan for wastewater collection and wastewater treatment systems.</p> <p>The scope of works includes the following tasks: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2050 horizon. - Assess the existing main wastewater infrastructures, and collect and study all reports, designs, and proposed masterplans. - Develop alternative recommended improvements to the wastewater systems in the service areas. - Prepare an action plan with capital cost estimates for each proposed capital investment.</p> <p>All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and cazas.</p>	<p>The Wastewater Systems Master Plan for the Mohafazat of the South and the Nabatieh aims to prepare a unified and final masterplan that can be used by the decision makers at the MEW and the South Lebanon Water Establishment (SLWE) in the preparation of a rationale infrastructure development and capital investment plan for wastewater collection and wastewater treatment systems.</p> <p>The scope of works includes the following tasks: - Forecast the volume of wastewater to be generated and needing to be treated up until the year 2050 horizon. - Assess the existing main wastewater infrastructures, and collect and study all reports, designs, and proposed masterplans. - Develop alternative recommended improvements to the wastewater systems in the service areas. - Prepare an action plan with capital cost estimates for each proposed capital investment.</p> <p>All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. 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Detailed cost estimates were developed by project components, types of work and cazas.</p>
Status	Completed	Completed	Outdated	Completed	Completed	Completed	Completed
Time frame							
Start date	2015	2015	2015	2015	2015	2015	2015
End date/Duration	2016	2016	2016	2016	2016	2016	2016
Additional Info	In addition to the WET master plan, a number of studies were conducted to implement the wastewater systems. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the WET master plan, other studies for wastewater in this area were prepared also to implement the works. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the WET master plan, a number of studies were prepared to implement the works. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the WET master plan, A detailed design was prepared to implement the works. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the WET master plan, detailed design studies were conducted to implement the works. The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the WET master plan, a number of studies were prepared to implement the works. X The data are from the most updated studies and the updated NWSS 2020 produced by the different concerned authorities (MoEW, CDR, LRA, and WEs)	In addition to the WET master plan, a detailed design was carried out by BTD to implement the wastewater works for Marjayoun caza. The assessment of the master planning situation for the area of Hasbaiya is presented in the Bekaa Area because Hasbiya and rachiya fall under the same basin and all related wastewater studies have been prepared for both areas together. The data are from the most updated studies and the updated NWSS 2020 produced by the concerned authorities (MoEW, CDR, LRA, and WEs).
LTA Assessment	<p>Current Situation: Master plan is done. Works are already executed in Saida. Some works are still needed in Saida caza.</p> <p>Recommendations : No action is needed.</p> <p>Areas & Localities in need to master plan: Area (1) Villages: Arab Salim, Houmine El Faouqa, Jarjouh, El Louaizé, Akmata, Mlikh, Aramté, Kefe-Houne, Mazraet El Bayad.</p>	<p>Current Situation: Works were executed. Works are still needed in some villages in the Southern Western part and the Nabaa El Tasse basin.</p> <p>Recommendations : New master plan for the Southern Eastern part of Nabatieh and the Villages discharging into the Nabaa El Tasse basin.</p> <p>Areas & Localities in need to master plan: Area (2) Villages : Kakiat El Jisr, Kafr Daljal, Adchite, Ksaibé, Braikeh, Abba, Jobchite Area (3) Villages : Sir El Gharbié</p>	<p>Current Situation: Master plan approved but works were completed only in Bint Jbeil (networks) and Tibnine systems. Works are needed outside Bint Jbeil and Tibnine WW systems.</p> <p>Recommendations : Master plan are needed for areas outside outside Bint Jbeil and Tibnine wastewater systems.</p> <p>Areas & Localities in need to master plan: Area (4) Villages: Froune, Ghandouriyé, Kantara, Deir Seriane, Achite El Koussair, Al Taibé, Rabb Salacine, Bani Haiyane, Kabrikha, Toulina, Borge Kalaouiyé, Kalaouiyé, Kherbet Salem, Souané, Jmeijmé, Majdel Selm, Talloussa, Markaba, Houla, Chakra, Meis El Jabal, Beit Yahoune, Kounine, Ainata, Mhaibib, Blida, Aitaroun Area (5) Villages : Yater, Salhané, Ramié, Beit Lif, El Kouzah, Sarbine, Rachafe, Debel, Aita El Chaab, Rmeiche, Ain El Katmoune, Hanine Area (6) Villages : Kafra, Harisse</p>	<p>Current Situation: Works are under construction according to the master plan.</p> <p>Recommendations : No action is needed.</p>	<p>Current Situation: Works are already executed in sour. Some works are still needed in Sour caza and the master plan for the Southern part needs to be revised.</p> <p>Recommendations : Master planning is needed for the Southern part.</p> <p>Areas & Localities in need to master plan: Area (7) Villages : Zebkine, Jebel El Batm Area (8) Villages : Abou Chech, Tair Harf, El Jbine, Chihine, Marouhine, Boustane, Mazraat Ez-Zalloutieh, Yarine, Mazraat Dhaira, Btaychiyé Area (9) Villages : Deir Kanoun Ras El Ain, El Kleilé, El Henniyé, Izzié, Majdalzoun, Chameh, Jejime, Hamoul, Eskandaroun, El Mansouri, Cheietiyé Area (10) Villages : Nakoura, Alma Chaab</p>	<p>Current Situation: Works are under construction.</p> <p>Recommendations : No action is needed in terms of master planning. Studies are still needed for the implementation of wastewater systems for the Western part of the Caza.</p>	<p>Current Situation: Works are under execution.</p> <p>Recommendations : No action is needed in terms of master planning.</p>



Legend

WWTP Status

- Existing
- Under Construction

No Action Needed

New Master Plan Required

Area details
(See next page / LTA Assessment)

Area of intervention	Current situation	LTTA Assessment / Recommendations
Hermel	Existing master plan for Hermel city and its surrounds	Partial funding is required to complete the project of Hermel. Prepare a new master plan for the areas outside the Hermel City
Baalbek, Deir el Ahmar, Chmistar, Laboueh	Works at Baaalbeck casa are mostly completed and the remaining part is awaiting funding, The master plans for Deir El Ahmar casa, part of Chmistar casa, the northern part of Balbeck casa (Younine, Makne till Chaat), and Laboueh casa excluding Aarsal are outdated	Prepare a new Master plan for Deir El Ahmar casa, part of Chmistar casa, and the Northern area of Baalbeck casa and Laboueh casa excluding Aarsal
Zahleh, Chtaura, Riyaq	Works at Zahle city and its surrounds are completed, the eastern part of Zahleh casa is at the detailed design and the western part is under construction	No actions are needed
South Beqaa (Joubb Jannine, Machghara)	Works are implemented in the northern area	Prepare a new Master plan for the Southern eastern area
South Beqaa (Rachaiya) and Hasbaiya (South Lebanon)	The updated master plan covers the whole area of Hasbaiya and Rachiya	No actions are needed

For more details see next page



EU-AFD TECHNICAL ASSISTANCE PROGRAMME TO SUPPORT REFORMS IN THE WATER AND WASTEWATER SECTORS IN LEBANON

WASTEWATER MASTER PLANS STATUS & PROPOSED ACTION

BWE



CONSULTANT

Hydroconseil | ESD | HYDROPHIL | VA

May 2023

	Master Plan 1	Master Plan 2	Master Plan 3	Master Plan 4	Master Plan 5
Covered area					
District	Hermel	Baalbek and Laboueh	Zahle	South Beqaa	South Beqaa
Casa	Hermel	Baalbek, Deir el Ahmar, Chmistar, and Laboueh	Zahleh, Chtaura, Riyaq	Joubb Jannine, Machghara	Rachaiya and Hasbayia (South Lebanon)
Nbr of localities	37	110	52	44	35
Covered population (2020)	97,500	561,447	491,000	181,780	80,552
Nbr of subscribers (2022)	3,954	29,078	34,523	18,738	4,500
Nbr connected to the sewer (2022)	0	8,273	15,565	5,552	0
Collection networks					
Nbr of Waste Water systems (Ex, UC, Planned)	2	3	5	3	17
The total length of the network (As per BWE Database)	32 km existing 17 km Under construction 387 km proposed	606 km existing 241 km Under construction 1215 km proposed	268 km existing 316 km Under construction 207 km proposed	275 km existing 462 km proposed	71 km existing 461 km proposed
Ratio EX/PR	8%	50%	129%	60%	15%
Treatment plants					
Nbr of WWTP (Ex, UC, Planned)	2	3	5	3	17
WWTP (Ex, UC, Planned)	1 Existing not operational (Kouakh) 1 Under construction (Hermel WWTP)	1 Existing WWTP (Iaat) 2 Existing and not operational (Deir El Ahmar, Yammoune) 1 Under Construction WWTP (Temnine El Tahta)	3 Existing (Zahle , Ablah, Fourzol) 2 Under construction (El Marj & Kfar Zabad WWTP)	3 Existing (Joub Jannine, Saghbine, Machghara / Aitanit)	4 Existing (Rachaiya, Bakka 1 & 2, Chouaia) 6 Existing not operational (Yanta 1 &2, Mimmes 1&2, Ain Harcha, Haouch El Qinnaabe) 7 Planned (Aakabe, Dahr El Ahmar, Deir Al Aachayer, Kfar Qoug, Majdel Balhiss, Mhaidthe, Beit Lahia) Trickling filter & Stabilization Ponds
Treatment Technology(ies)	Conventional Activated sludge, MBBR	Conventional Activated sludge	Trickling Filter , Activated sludge	Trickling Filter , Activated sludge	Trickling filter & Stabilization Ponds
Effluent Discharge (Coastal/Inland)	Inland	Inland	Inland	Inland	Inland
Use	Wastewater	Wastewater	Wastewater	Wastewater	Wastewater
Project Holder (CDR, MoEW, WEs)	BWE	BWE	BWE	BWE	BWE/CDR
Consultant	KREDO	KREDO	KREDO	KREDO	KREDO and DAHT
Description and Scope of works	Master Plan within the Service Area of the Bekaa Water Establishment for the planning horizon of 2035. A detailed assessment of the existing situation was carried out and Capital Investment Plans and Priority Action Plans for water supply and wastewater systems were developed to provide full service to the population of the Bekaa which was projected to reach 1.5 million residents in 2035. All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and casas.	Master Plan within the Service Area of the Bekaa Water Establishment for the planning horizon of 2035. A detailed assessment of the existing situation was carried out and Capital Investment Plans and Priority Action Plans for water supply and wastewater systems were developed to provide full service to the population of the Bekaa which was projected to reach 1.5 million residents in 2035. All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and casas.	Master Plan within the Service Area of the Bekaa Water Establishment for the planning horizon of 2035. A detailed assessment of the existing situation was carried out and Capital Investment Plans and Priority Action Plans for water supply and wastewater systems were developed to provide full service to the population of the Bekaa which was projected to reach 1.5 million residents in 2035. All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and casas.	Master Plan within the Service Area of the Bekaa Water Establishment for the planning horizon of 2035. A detailed assessment of the existing situation was carried out and Capital Investment Plans and Priority Action Plans for water supply and wastewater systems were developed to provide full service to the population of the Bekaa which was projected to reach 1.5 million residents in 2035. All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work and casas.	The KREDO master plan was recently updated by DAHT who prepared a feasibility study for Hasbiya and Rachiya excluding the Arqoub region and the Hasbiya Ain-Qonia Choueiyya where a separate partial master plan and a detailed design for the Arqoub were also prepared. All technical recommendations were aligned with the National Water Sector Strategy adopted by the Lebanese Government and proposed works were optimized to reduce operation & maintenance and energy costs. Detailed cost estimates were developed by project components, types of work, and casas.
Status	Completed	Completed	Completed	Completed	Completed
Time frame					
Start date	2013	2013	2013	2013	NA
End date/Duration	2015	2015	2015	2015	NA
Additional Info	In addition to the Kredo master plan, other studies for wastewater in this area were prepared by DAHT for the city of Hermel and its surrounds. It should be noted that the data are from the most updated studies and the updated NWSS 2020.	In addition to the Kredo master plan, other studies for wastewater in this area were prepared by a number of consultants. It should be noted that the data are from the most updated studies and the updated NWSS 2020. Outside the areas where works are implemented, under design or construction, the wastewater systems should be revised in a way to have a wastewater system compatible with the current situation in the area.	The master plan was complemented by studies and design works to implement the needed wastewater systems .	In addition to the Kredo master plan, advanced and detailed studies for wastewater in this area were prepared also by other consultants. It should be noted that the data are from the most updated studies and the updated NWSS 2020. Outside the areas where works are implemented, under design or construction, the wastewater systems should be revised in a way to have a wastewater system compatible with the current situation in the area.	The DAHT master plan is in use.
LTTA Assessment	Current Situation: The master plan for Hermel city and its surrounds is under implementation and the execution of works is on hold due lack of funds. Outside Hermel city, the master plan was not revised and no additional studies were also made. As a result, a new master plan must be carried out to consider the output of the new strategy in terms of demography, infrastructure, and water resources changes, and to base the design of the master on realistic figures. Recommendations: Prepare a new master plan for the areas outside Hermel City. Areas & Localities in need to master plan: Area (1) Villages : Boustane, El Hmaire, Jwar El Hashish, Maql Ayoub, Mrah El Damdoum Area (2) Villages : Al Barkhsh, Qornet Es Sendyene, Sawah Allaou, Marjhen, Beit Allaou, El Hima, El Msateb, El Mdaouich, Ob Elsher, Biout Ein Jamee, Ain El Hramiyeh, Es Soueidiyeh, Ein El Baida, Choab Daiee Area (3) Villages: Al Knaise, Al Maaisa, Wadi En Nara, Wadi Bnit, Wadi Faara, Mrah Yassin, Mazraat El Fakih	Current situation: Works at Baalbeck casa are mostly completed and the rest is awaiting funding. The master plans for Deir El Ahmar, the Northern part of Balbeck casa (Younine, Makne till Chaat) is outdated. Recommendations: Prepare a new Master plan for the Deir El Ahmar, Part of Chmistar casa, the Northern area of Baalbeck casa, and the Laboueh casa excluding Aarsal. Areas & Localities in need to master plan: Area (4) Villages : Bouday, Saaiyde, and Haouch Ed-Dahab, Faloui, Hafir, Mrah El-Jeddaoui, Mazraat Ed-Dallil, Ouadi oum Aali Area (5) Villages: Nahle, Maqne, Kneisseh, Younine, Riha, and Chaat, in addition to a part of Nabha. Area (6) Villages : Chlifa, Dar El-Ouassaa and Btedaai Area (7) Villages: El-Qaa, including El-Qaa and the villages and agglomeration situated along the northern country border. Area (8) Villages : Deir El-Ahmar, El-Ram, Barqa, Bachwat, Karha and Nabha. Area (9) Villages: Mikrak, Laboueh, Nabi Osmane, El-Ain, El-Fakhe (including Jdeide), Ras-Baalbeck (Es-Sahl), Harbata, Sbouba, El-Kharayeb, Ouadi El-Osse, Halbata, Zabboud,	Current Situation: Works at Zahle city is completed, The eastern part is at detailed design and the western part is under construction. Recommendations: No actions are needed.	Current Situation: The updated master plan covers the whole northern area. Recommendations: Prepare a new Master plan for Sohmor and Srairi areas. Areas & Localities in need to master plan: Area (10) Villages : Sohmor Area (11) Villages : Ain El Tine , Maidoun , Kellia, Yohmor, Zelleya, Loucia.	Current Situation: The updated master plan covers the whole area of Hasbayia and Rachiya. Recommendations: No actions are needed