KNOWLEDGE GENERATION LEAFLET

Background and Purpose

The Lebanese Ministry of Energy and Water (MEW) prepared in 2010 a National Water Sector Strategy (NWSS). The strategy was endorsed by the Council of Ministers on March 9, 2012.[1] It presents a detailed road map for improving water conditions and service delivery in Lebanon, and recommends the preparation of a Strategic Environmental Assessment (SEA). The Terms of Reference for the SEA study were prepared by Plan Bleu in consultation with MEW and Lebanese Ministry of Environment (MOE). Plan Bleu funded the SEA under the Global Environment Facility project "Regional Governance and Knowledge Generation" and commissioned ECODIT to carry out the study.

The National Water Sector Strategy NWSS

The National Water Sector Strategy articulated seven objectives:

(1) Maximizing the potential and improving the quality of surface water resources,
(2) Improving the management and protection of groundwater resources,
(3) Fulfilling deficits through groundwater and/or surface water,
(4) Ensuring proper and continuous access to high quality water supply,
(5) Providing adequate quantities and quality of water for irrigation,
(6) Increasing coverage of wastewater collection networks and treatment capacities, and
(7) Optimizing current wastewater treatment processes and sludge disposal.

The NWSS is divided into two parts: 7 infrastructure initiatives and 5 water sector initiatives:

Strategy Initiatives	*Summary Description*	*Cost Estimate ($M)*
1. Optimizing surface water storage	• 64 million CM of additional water	$2,206 (29% of total CAPEX)
2. Artificial recharge of groundwater aquifer	• Up to 200 million CM of additional water by artificial recharge (during the wet season / excess flow)	
3. Surface storage: dams and hill lakes	• Up to 670/880 million CM of water storage (static/dynamic) • 42 candidates sites for dams and hill lakes (<1 million CM)	
4. Water supply transmission	• 2800 km of transmission pipes • 191000 m^3 of storage in 561 tanks	$1,790 (23%)
5. Water supply distribution	• 9600 km of distribution pipes • About 1 million water meters	
6. Irrigation rehabilitation and expansion	• Up to 30,000 ha irrigated by 2020 • Additional 60,000 ha irrigated by 2035	$577 (7%)
7. Wastewater collection & treatment	• 12 coastal STPs planned to serve 5,597,000 people-equiv. • 42 inland STPs planned to serve 1,977,750 people-equiv.	$3,104 (40%)

[1] The NWSS was approved a few weeks before the SEA Decree 8213/2012 was enacted by the Council of Ministers; it was therefore not possible to commission the SEA earlier, i.e., before the formal endorsement of the NWSS.

The SEA Process in Lebanon

The SEA process in Lebanon is fairly new. Whereas several SEAs were conducted since 2004, Lebanon formally passed the required SEA regulation (Decree 8213) in 2012 making the SEA process mandatory for all policies, programs, and strategies. The SEA of the NWSS is the first SEA to be conducted in accordance with Decree 8213/2012.

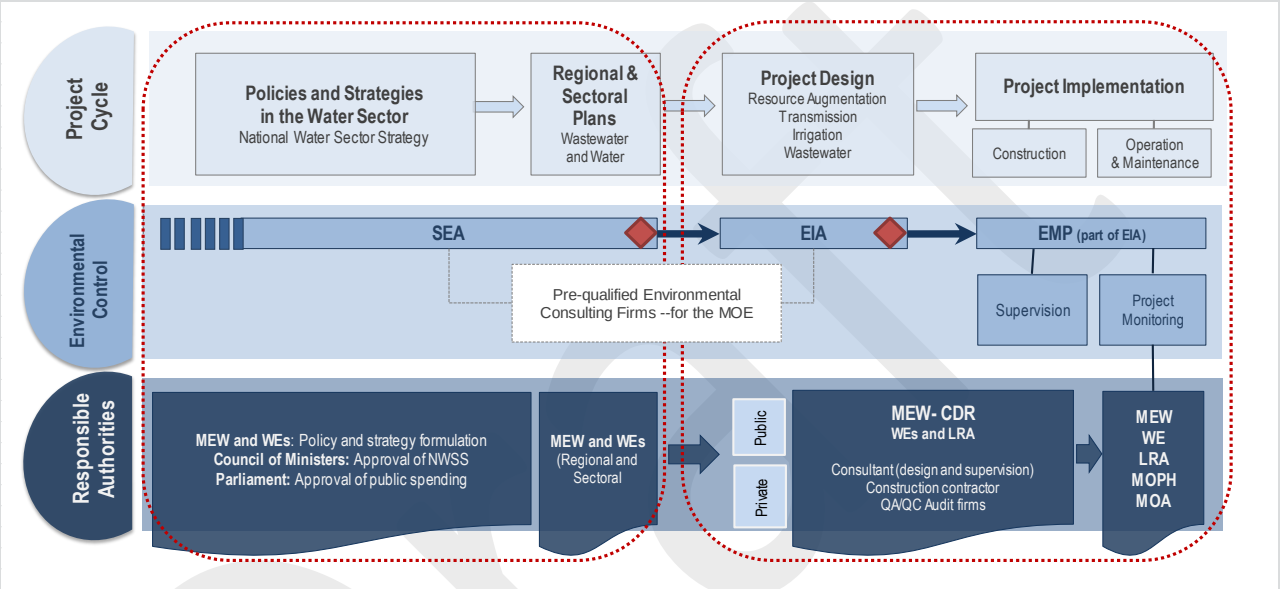
To understand the function and purpose of the SEA of the National Water Sector Strategy, ECODIT prepared a flowchart explaining the SEA process in relation to the project cycle.

Lebnon's growing SEA Experience:

Jounieh Bay Rehabilitation Plan (2004)
Land Use Planning in Tannourine (2006)
Lebanon Mountain Trail Project (2008)
Lebanese Petroleum Sector (2012)

On-going SEAs include:

Renewable Energy Sector (on-going)
ADEL NORD (on-going)
Lebanese Electricity Policy Paper (tender)



Acronyms: **CDR** Council for Development & Reconstruction, **EIA** Environmental Impact Assessment, **EMP** Environmental Management Plan, **EMS** Environmental Management System, **LRA** Litani River Authority, **MEW** Ministry of Energy & Water, **MOA** Ministry of Agriculture, **MOE** Ministry of Environment, **MPH** Ministry of Public Health, **SEA** Strategic Environmental Assessment, **WE** Water Establishments.

Key Environmental and Social Impacts

Based on a targeted assessment of baseline conditions, ECODIT identified 12 Key Issues (environmental, social and economic). These issues carry national and/or strategic importance; other issues not presented here should be addressed in project-specific EIA studies. The most significant environmental and socio-economic impacts and corresponding mitigation and policy responses are:

SEA Key Issues	Key Impacts	Key Mitigation and Policy Response
1. Climate Change Adaptation	• CC uncertainty may impact storage capacity of proposed dams and hill lakes	• Prioritize water data to improve CC knowledge • Develop drought management plants for all sectors
2. Effects on Ecology and Ecosystems	• STPs will significantly reduce pollution levels in surface and groundwater • Dams will inundate forests and fragile ecosystems • Man-made lakes will provide new habitats for birds and water-dependent species	• Conduct in-depth assessments of the baseline conditions to document species and habitats • Reduce the extent of inundation to protect important species and ecosystems • Replace the MOA policy for "replacement trees" with an ecological restoration plan
3. Effects on Marine Environment and Coastal Waters	• STPs will significantly reduce pollution levels in the Mediterranean Sea • Dams will reduce the natural sedimentation process near river outfalls	• Monitor BOD_5 discharges into the Mediterranean Sea and inform the public • Monitor marine ecosystems near river outfalls affected by dams upstream
4. Effects on Underground Water and Karst	• Lebanon's complex geology (and extensive underground karst) may impact the permeability of dams	• Develop Guidance Note for project EIAs on how to assess the effects on groundwater • Engage professional caving clubs in the studies
5. Water-Energy Nexus	• Lack of energy data make it difficult to assess the NWSS's energy foot print • Dams will increase opportunities for gravity transmission and thereby reduce energy costs • Irrigation schemes will significantly reduce hydroelectric production on the Litani River	• Establish information system to monitor energy consumption at the utility level • Review Lebanon's renewable energy pledge (12% by 2020) and remove barriers to hydropower production in public / private sectors
6. Man-Made Water Bodies and Buffers	• Dams are land greedy; planned expropriations did not consider buffer zones • Man-made water bodies will increase the value of surrounding lands and attract new activities that could degrade the resource	• Develop Guidance Note on how to delineate and manage buffer zones, and control land use activities by land management authorities • Develop Guidance Note on how to manage and protect Man-Made Water Bodies
7. Catastrophic Failure and Emergency Planning	• Lebanon has no experience in Emergency Action Planning in the water sector; • Lebanon has no classification system for dams • STPs cannot handle industrial wastewater	• Adopt the World Bank classification system for dams (OP 4.37) and commission EAPs accordingly; encourage EAP testing • Monitor industrial discharges and enforce pre-treatment requirements to avoid malfunction
8. Water-Poverty Nexus	• Increased water supply (domestic and agriculture) will significantly improve living conditions, especially in farming community • The influx of Syrian refugees has exacerbated water shortages (unforeseen event)	• Improve irrigation efficiency and crop selection in areas that will benefit from irrigation water • Develop a fair water and wastewater pricing structure (consumption based)
9. Treated Sewage Effluent and Sludge Reuse	• STPs will produce a stream of Treated Sewage Effluent and sludge • The location of several coastal STPs limit the potential for TSE reuse	• Review draft guidelines for TSE and sludge reuse; train farmers on TSE reuse • Develop Guidance Note on TSE discharge into streams to avoid loading receiving waters
10. Construction and Excavation Waste	• Lebanon has a poor record in the management of construction / excavation waste • NWSS investments will potentially result in significant waste volumes affecting landforms	• Optimize cut-and-fill operations during all construction works • Enforce site-cleanup and restoration plans in all NWSS investments
11. Operation and Maintenance	• Lebanon's Water Utilities have very limited O&M capabilities; the transfer of STP to the utilities has experienced extensive delays	• Enhance O&M systems in all NWSS programs (production, transmission, wastewater) • Provide Guidance Notes for improved O&M
12. Transboundary water	• The NWSS will dam two transboundary rivers with Syria and 1 transboundary river with Israel	• Conflict prevents the conclusion of any water agreement with Israel for Wazzani/Hasbani

Recommendations for Integrating SEA Findings in the NWSS

The SEA Report identified 12 key issues potentially affected by the NWSS. The analysis of impacts and the potential mitigation measures and policy responses resulted in the following priority recommendations:

(1) **Mid-term appraisal of the NWSS.** Such an appraisal would draw the lessons learned from experience so far, reassess targets and methodologies, and implement SEA safeguards. MEW can now refer to actual experience to see where the NWSS worked, was too ambitious, or was derailed by unforeseen events (budget overruns, Syrian refugee crisis, and drought).

(2) **Iterative process for NWSS revisions.** Based on this mid-term appraisal, the MEW should review the NWSS and its strategic roadmap (2010-2020) and consider scaling-back its dams program in light of social, economic, and environmental constraints. MEW should address the legitimate concerns of the public in affected areas and ensure full compliance with EIA regulations.

(3) **Implementation Unit for oversight and monitoring.** There is an urgent need to clearly assign responsibility for oversight and monitoring of the NWSS in one unit at the MEW. By virtue of its mandate, this unit would improve NWSS communication with other agencies and immunize the strategy from political interference.

(4) **Improving the national water dialogue.** Since the MEW does not have direct power to require ministries and bodies outside its jurisdiction to undertake any action related to the NWSS, it has to rely on dialogue. The proposed National Water Council would be able to address actions that require broad cross-sectoral co-operation including data sharing, catchment protection, climate change adaptation, and Water Demand Management.

The SEA identified the following gaps:

System for dam classification (for example, small and large dams based on World Bank's OP 4.37)

Guidance Note on the construction and O&M of water projects to inform the EIA process.

Guidance Note on man-made water bodies specifying which activities are sanctioned, buffer zone requirements, and minimum erosion control-measures.

Guidance Note on Treated Sewage Effluent discharge into water courses that take into consideration the quality of TSE and the volume of receiving waters.

Limitations of the NWSS – SEA

The SEA was conducted *after* the endorsement of the NWSS. Because the NWSS is well underway, some of its momentum cannot be reversed (dams under construction, sewage program) regardless of the SEA findings and recommendations.

The SEA should review and assess proposed alternatives that have been identified and studied by the client (MEW) to provide sufficient information for proper assessment.

The SEA coincided with two unforeseen events that may alter the course of the NWSS; the influx of 1.5 million Syrian refugees (requiring an additional 43-70 million m3 per year) and one of the driest winters on record (2013-2014).

The SEA was partially eclipsed by the release of a milestone water strategy report prepared by civil society; although Blue Gold is not incompatible with the NWSS, the national water discourse strained the SEA public consultation process.