
# Cost Assessment of Water Resources Degradation (CAWRD)
## Conclusions et Recommendations
## Consultation Meeting

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# General Conclusions of the Study

- **The environment neglect of the Litani Basin is becoming a burden on the Lebanese Economy**. The cost assessment of water resources degradation was estimated at 339 billion LBP or US$ 225 million/year corresponding to the 0.5% of the GDP of Lebanon in 2012. The cost of water degradation corresponds to approximately half of the cost the water resources degradation in Lebanon for a basin occupying only 21% of the Lebanese surface area and about 25% of its population.

- **The environmental health bill due to the burden of waterborne diseases is also high and was estimated at LP 74 billion/year (US$ 49 million) or 0.7% of the ULB GDP** whereas the burden of waterborne diseases represented 0.5% of the national GDP in 2005. Major sources of waterborne diseases are due to: untreated wastewater which is 96% of the total wastewater generated as only 4% is being treated; poor quality of potable water from private wells as more than 50% of the ULB population rely on wells; and poor hygiene practices that still need to be assessed, especially among the poor.

- **Physical losses and other non-revenue water are excessive and was estimated at 50% for domestic water and 30% for irrigation**. These losses of totalling 151.2 MCM/year and estimated at LBP 48.4 billion/year (US$ 32.0 million) could be seen as a cost borne by the Lebanese population with no return on investment. The high rate of leakage in the water network contributes to heavy losses and to the low reliability of water supply. These losses are due mainly of lack of investments in the networks and more importantly due to a lack of regular operation and maintenance costs.

# General Conclusions of the Study (ctd)

- **Water resources allocation does not reflect the reality of the socioeconomic conditions in the Litani Basin.** The decree 14522/1970 issued for more than 40 years ago still defines the amount of manageable water from the Litani System and its allocation for irrigation and domestic use in the southern Bekaa. Priority of water allocation is for hydropower (without which many cities and villages will be in the dark) and for domestic use. There is no approved water resources master plan for the Litani which should take into account the supply and demand management based on economic principles, the future long term needs of this basin taking into consideration population growth, climate change impacts as well as the necessary environmental flow for protecting the biodiversity resources in the basin.

- **Too little attention was given to the Lower Litani Basin and its development opportunities were not fully explored**. The majority of studies, research and monitoring were focused in the Upper Litani Basin because of its socioeconomic importance. The water resources in the LLB are not contaminated with the same level of pollution found in the ULB, however with the future operation of the canal 800, the water quality may be adversely affected as the canal will withdraw 20 MCM of water per year for domestic and industrial use and 86 MCM of water per year for agricultural purposes from the Qaraoun Lake which is already polluted. As the construction of the canal is in its first stage which will be completed in 2017, further investigation on the water quality of the canal 800 and the impacts of pollution transfer should be undertaken by the MOEW and the MOE so as to prevent further deterioration of the water quality as it is occurring in canal 900.

# General Conclusions of the Study (ctd)

**The fragmented responsibilities between the MOEW, MOE, LRA, and the Water Establishments are contributing to poor environmental performance in terms of monitoring and enforcement and have prevented the efficient development and management of the water and wastewater services.**

- Major sector studies and notes prepared by Development Partners such as the World Bank, USAID and AfD have stressed the importance of speeding up the process of a transparent governance in the water and the wastewater sectors as required in the NWSS.
- The World Bank has recommended strengthening the capacity of the WEs and provide them the operational and financial autonomy with accountability. USAID has recommended that the best institutional arrangement for the Litani is that the Litani River Authority becomes the Litani Basin Authority with full-fledged responsibility and accountability of all the water activities in the Basin. No formal decision was yet reached by the Government.

# Five Axes of Interventions are Recommended

**Support the River Basin Agency Concept to be implemented by the Litani River Authority (LRA).** The underlying issues of the Litani Basin and its socio-political impacts are so complex that the present status quo of the present fragmented responsibilities will not ensure the environmental sustainability of this important basin.

- **There is an urgent need to establish an integrated river basin management at LRA in which water management** should be made at the basin level for water allocation, monitoring, compliance and enforcement and closer interactions with water users and operators.
- **MOEW strategic role in developing water policies, regulating the regional water establishment and planning and financing large hydraulic infrastructures will certainly be maintained.**

# Five Axes of Interventions are Recommended (ctd)

- **Focusing first on "the low hanging fruits" for reduction of the water losses and for non-revenue water for water in the water supply and irrigation networks as well as practices. This will require**:
  - ❑ Preparation of an inventory and an action plan with costs for the rehabilitation of the water, wastewater, and irrigation networks and the establishment of outcome-based technical and financial targets for reducing losses in these systems.
  - ❑ Implementation of the action plans using the local manpower for replacing existing old transmission and distribution of potable water and irrigation systems.
  - ❑ Establishment and maintenance a leak detection system and irrigation techniques, cropping patterns, surfacing soil, drainage systems, etc. as well as establishing specific indicators of management and performance for the water supplies and irrigation systems to be contracted out to professional engineering firms

# Five Axes of Interventions are Recommended

- **Improving the programming, investment efficiency and the maximization of environmental benefits in the wastewater sector. The proposed interventions should be:**

- ❑ To improve first the sanitation in rural and urban poor areas to cover about 688,000 inhabitants that could not have access to improved sanitation, through the adoption of low cost technologies and subsidized capital and operation and maintenance costs.
- ❑ To increase also the coverage and the treatment capacities of the existing wastewater treatment plants which are either not functional or not operating at their initial installed capacity.
- ❑ These measures will have to be undertaken within an effective reprogramming and sequencing of investments which take into account the capital and the operation and maintenance costs as well as the operation of these plants by qualified utilities firms.

# Five Axes of Interventions are Recommended(ctd)

- **Reducing environmental threats due to the 4 pollution pressures in the ULB. The following recommendations are proposed:**
- To conduct additional pre-feasibility analyses to prioritize based on efficiency the long list of interventions proposed in this program regarding municipal wastewater discharge, industrial effluents, solid waste leachate and agricultural runoff.
- To adopt, based on results of these pre-feasibility studies, a structured and sequenced approach to pollution control by investing in:
  - ❑ building, densification and calibration of the sewer network and connect it to the operating and planned WWTPs
  - ❑ the in situ treatment of industrial effluents;
  - ❑ closing/rehabilitating open dumps near by the Litani River and its tributaries and establishing municipal treatment facilities in major cities using the Zahle model

# Five Axes of Interventions are Recommended: Reducing Environmental Threats(ctd)

- **To reinforce the monitoring and enforcement and compliance system by ensuring that polluting enterprises would comply with auto-control and self-monitoring as required by the Framework of the Environment Protection Law 444 and the environmental compliance certification system (Decree 8471-2012) and by outsourcing regular inspections to certified laboratories or universities to enable the MOE to take the necessary legal actions against polluters in conjunction with both the MOEW and Ministry of Industry.**

# Five Axes of Interventions are Recommended (ctd)

- **Strengthening the knowledge on the development of water resources in the Lower Litani Basin (LLB) and future transfers by:**
  - Institutionalizing the water quality and quantity monitoring system which was developed under the LRBMS.
  - Conducting a strategic regional environmental assessment of the LLB to evaluate the environmental consequences and impacts of transferring the polluted water from the ULB to the LLB through canal 800 that is under construction, and to Beirut through the planned conveyor.

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**Thank you**
**for your attention**

**Merci pour**
**votre attention**

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