National Water Sector Strategy

"A right for every citizen, a resource for the whole country"





LEBANESE REPUBLIC
MINISTRY OF ENERGY AND WATER

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Baseline

Demand/Supply Forecasts

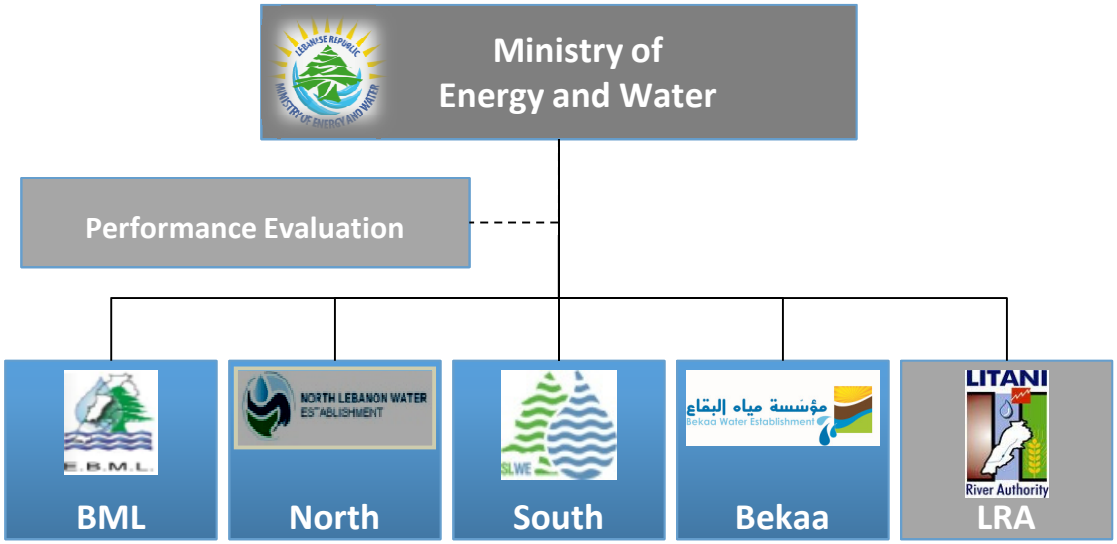
Sector Enabling Environment

- **Institutional and Organizational Initiatives**
- Financial and Commercial Initiatives
- Legal and Regulatory Initiatives
- Environmental Concerns

Investment Plan

Strategic Roadmap

Roles and responsibilities in the water sector are well defined in Law 221 …



Role of Water Establishments According to Law 221(*)

a. Design, implement, operate and maintain potable and irrigation distribution projects based on national master plan and resources allocated by MEW
b. Collect, treat and dispose of wastewater based on treatment and outfall sites approves by MEW
c. Propose water supply, irrigation and wastewater tariffs
d. Monitor water quality for distributed water supply and irrigation

Role and Modus Operandi of Performance Evaluation Committee

To be determined by joint decision of ministers of Energy & Water and Finance

Role of the Ministry of Energy and Water (Law 221)

1. Monitor, control, measure, study water resources, and estimate water needs
2. Monitor the quality of surface and groundwater and set quality standards
3. Develop and update a national masterplan for the allocation of potable and irrigation water resources, and develop a wastewater masterplan
4. Design and implement large water infrastructure projects
5. Perform artificial recharge of ground water aquifers and monitor extractions
6. Develop legal framework and procedures to protect water resources from pollution and improve water quality
7. Issue permits for water prospection and use of public water and property
8. Conduct and update hydro-geological studies and research, and collect technical water data
9. Monitor and regulate WEs and other entities working in the water sector
10. Enhance and monitor WE performance of according to indicators set in their business plans
11. Set standards and regulations for (i) studies and project execution, (ii) surface and groundwater exploitation and wastewater; and (iii) water quality monitoring
12. Perform expropriation transactions for MEW and WEs
13. Provide opinion on permits related to mines and quarries and impact on water resources
14. Ensure public relations and provide relevant information related to water conservation

Source: Law 221/2000 and its amendments
Note: (*) Applies to BML, North South and Bekaa WEs but does not fully apply to LRA

… where MEW is in charge of policy making, national planning and water resource management, while WEs will ensure service provision

	Description of Responsibilities	MEW	WEs
Policy Making	▪ Definition of sector policy, institutional roles and sector structure ▪ Enactment of legislation and regulation ▪ Development of investment and subsidy policies	✓	
Planning	▪ Establishment of long term consolidated planning for water, irrigation and wastewater ▪ Evaluation of infrastructure and investment requirements	✓	✓
Conservation/ Resource Management	▪ Allocation of resources across regions e.g., water reuse ▪ Identification and promotion of water conservation campaigns	✓	
Regulation	▪ Issuance of regulations ▪ Enforcement of regulations and standards for cost recovery, service quality, and consumer relations ▪ Review and approval of tariff adjustment in accordance with rules and regulations	✓	
Business Operation	▪ Provision of services including billing and collection ▪ Maintenance and renewal of infrastructure ▪ Funding and execution of investment programs		✓

All the deficiencies in the implementation of Law 221 will be addressed

Main Implementation Deficiencies of Law 221

▪ The implementation of the reform law	▪ Initiated but not fully concluded
▪ The transfer of functions to the four WEs	▪ Subject to several delays
▪ Administrative and financial autonomy of WEs	▪ WEs not yet fully empowered
▪ The legal text to organize the work of MEW	▪ Has not been developed yet
	▪ MEW still dedicated to projects/O&M
▪ Availability of funds and technical staff	▪ WEs still suffer from shortage
▪ Performance monitoring of WEs	▪ Not yet enforced

Initiative # II.1

1.1. Perform all priority actions required to complete the restructuring of WEs and address potential limitations, mainly:

- Development of revised and improved organization structures for WEs based on roles and responsibilities
- Drafting revised WE organization bylaws, supporting in the approval process and following up on their enactment
- Implementation of the restructuring of WEs
- Evaluate the potential for efficient outsourcing of certain non-core functions
- Providing needed support for WEs to gradually reach full administrative and financial autonomy

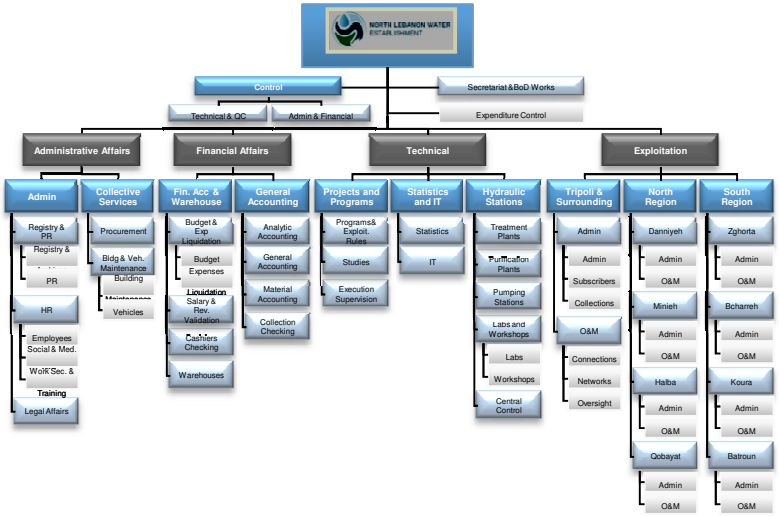
1.2. Improve on the operating model between WEs and MEW to ensure an integrated water resource management, mainly through:

- Improvement in coordination
- Ensuring an integrated management of water resources
- Providing operational and financial empowerment of WEs together with proper mechanisms for performance management
- Ensuring the involvement of WEs in project planning and implementation

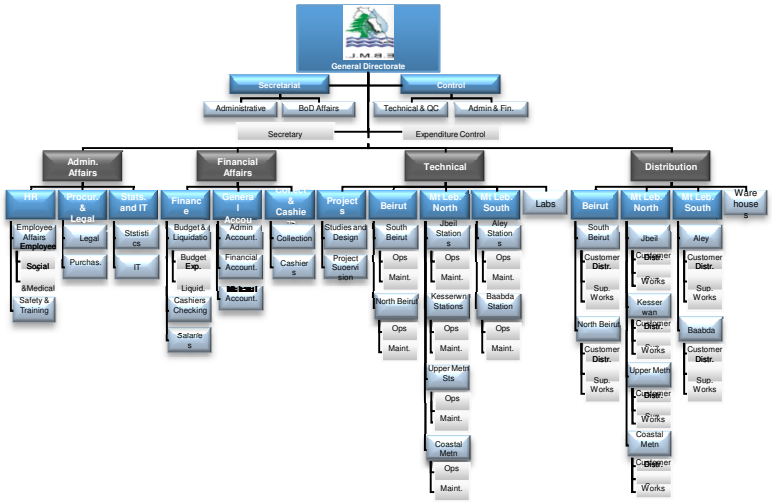
Organization structures of WEs will be reviewed for an improved performance

To date, LRA still doesn't have an organization structure

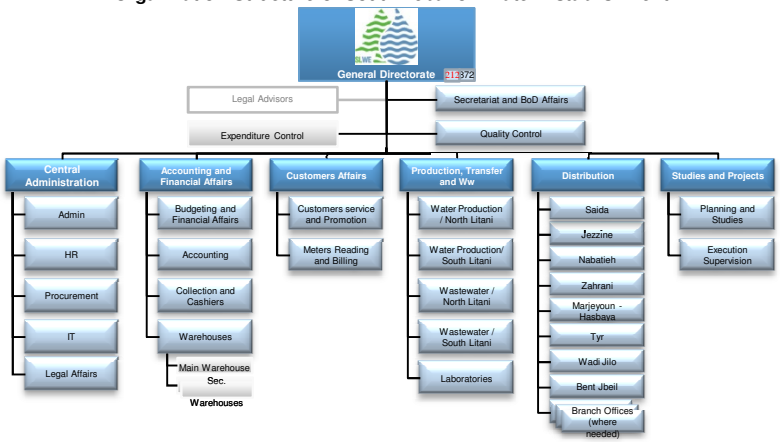
Organization Structure of North Lebanon Water Establishment



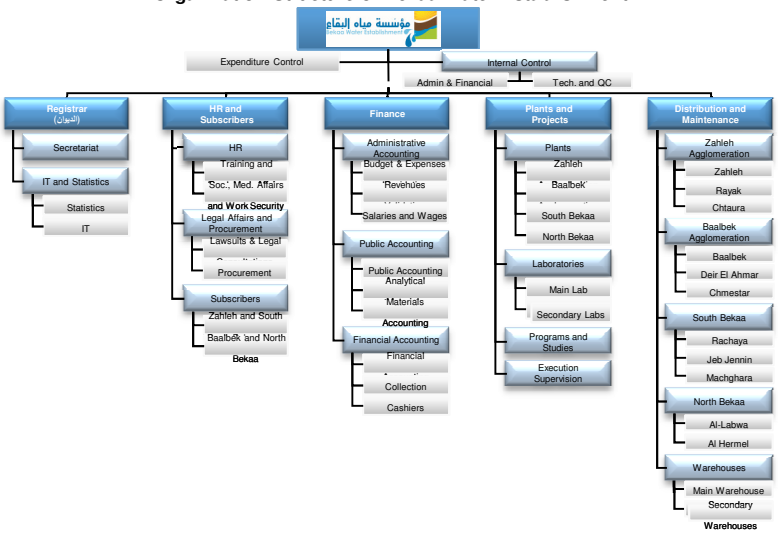
Organization Structure of Beirut & Mount Lebanon Water Establishment



Organization Structure of South Lebanon Water Establishment



Organization Structure of Bekaa Water Establishment

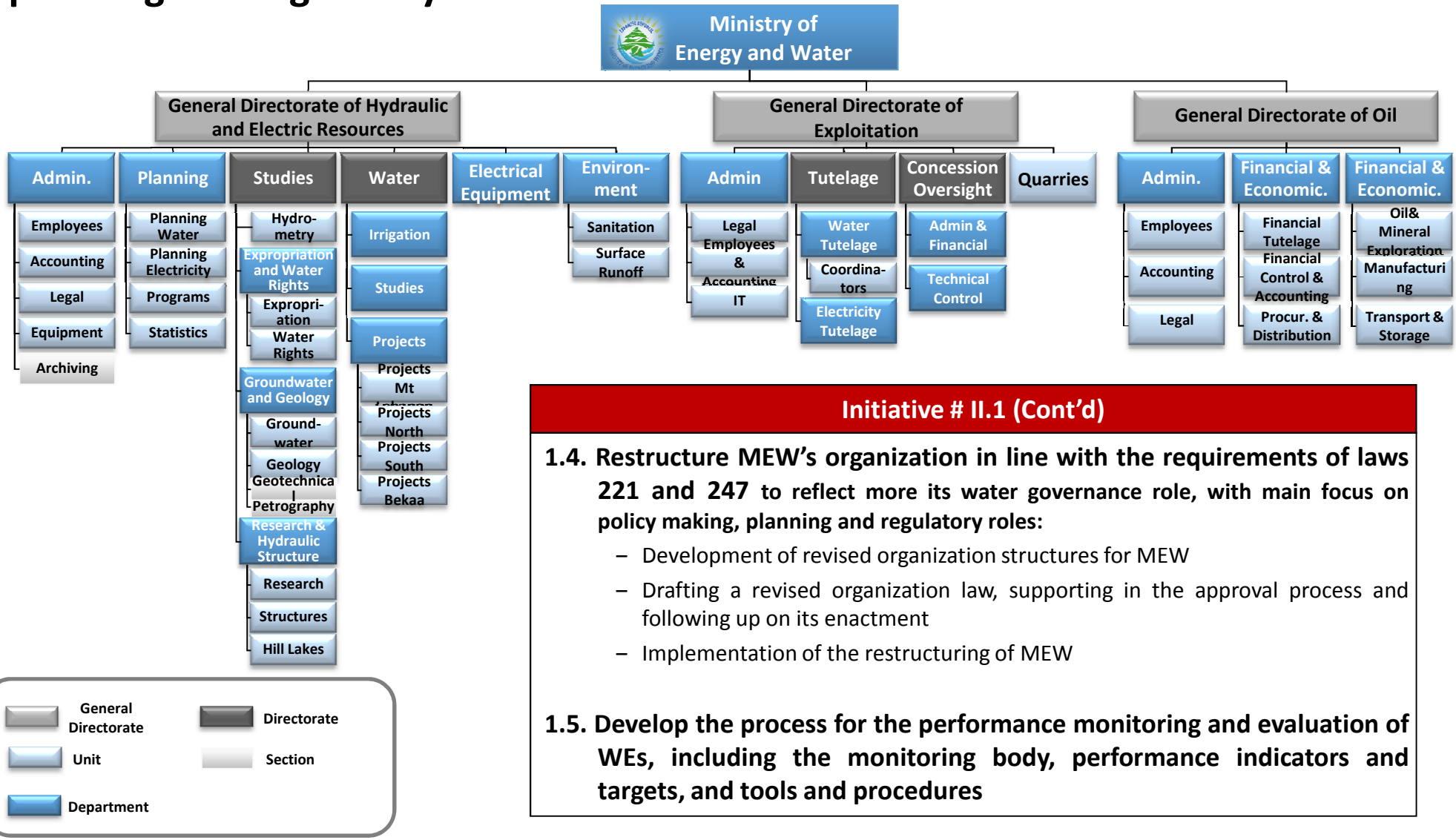


Initiative # II.1 (Cont'd)

1.3. Improve on the performance of WEs to reflect:

- More focus on irrigation and wastewater responsibilities, in addition to current water supply activities
- Most suitable organization for technical functions i.e. operation, maintenance for production, transmission and distribution
- Improvements to support functions e.g., Strategic Planning and Business Planning, Water Demand Management, performance management, more focus on IT, Fixed Asset Management, Supply Chain Management, HRM, Customer Service, Control and Audit functions

MEW's organization will be restructured with main focus on policy making, planning and regulatory roles



Initiative # II.1 (Cont'd)

1.4. Restructure MEW's organization in line with the requirements of laws 221 and 247 to reflect more its water governance role, with main focus on policy making, planning and regulatory roles:

- Development of revised organization structures for MEW
- Drafting a revised organization law, supporting in the approval process and following up on its enactment
- Implementation of the restructuring of MEW

1.5. Develop the process for the performance monitoring and evaluation of WEs, including the monitoring body, performance indicators and targets, and tools and procedures

Manpower needs and training requirements will be assessed to ensure optimal management of the sector

Initiative # II.1 (Cont'd)

1.6. Provide the required manpower levels and capabilities to ensure an appropriate operation and maintenance of assets and the delivery of water at optimal service levels, through the:

- Staffing of MEW and WEs to required manpower levels according to recommended organization structures
- Exploring outsourcing potential
- Continuous development of staff through proper training

- Perform bottom-up manpower planning based on workload drivers, requirements and current and forecasted workload volumes for each activity according to recommended organization structures
- Assess gaps given current number of employees
- Assess capabilities of MEW and WE staff and identification of training requirements

Assess the needs of MEW and WEs for additional staff and training of exiting personnel

Recruitment

- Develop a staff selection process to fill gaps where applicable for permanent and non-permanent (contract based) employees
- Develop job description for each required position
- Advertise for position
- Screen CVs, shortlist and select candidates for interview
- Conduct relevant procedures, evaluate and communicate decision

Transfers Across Entities

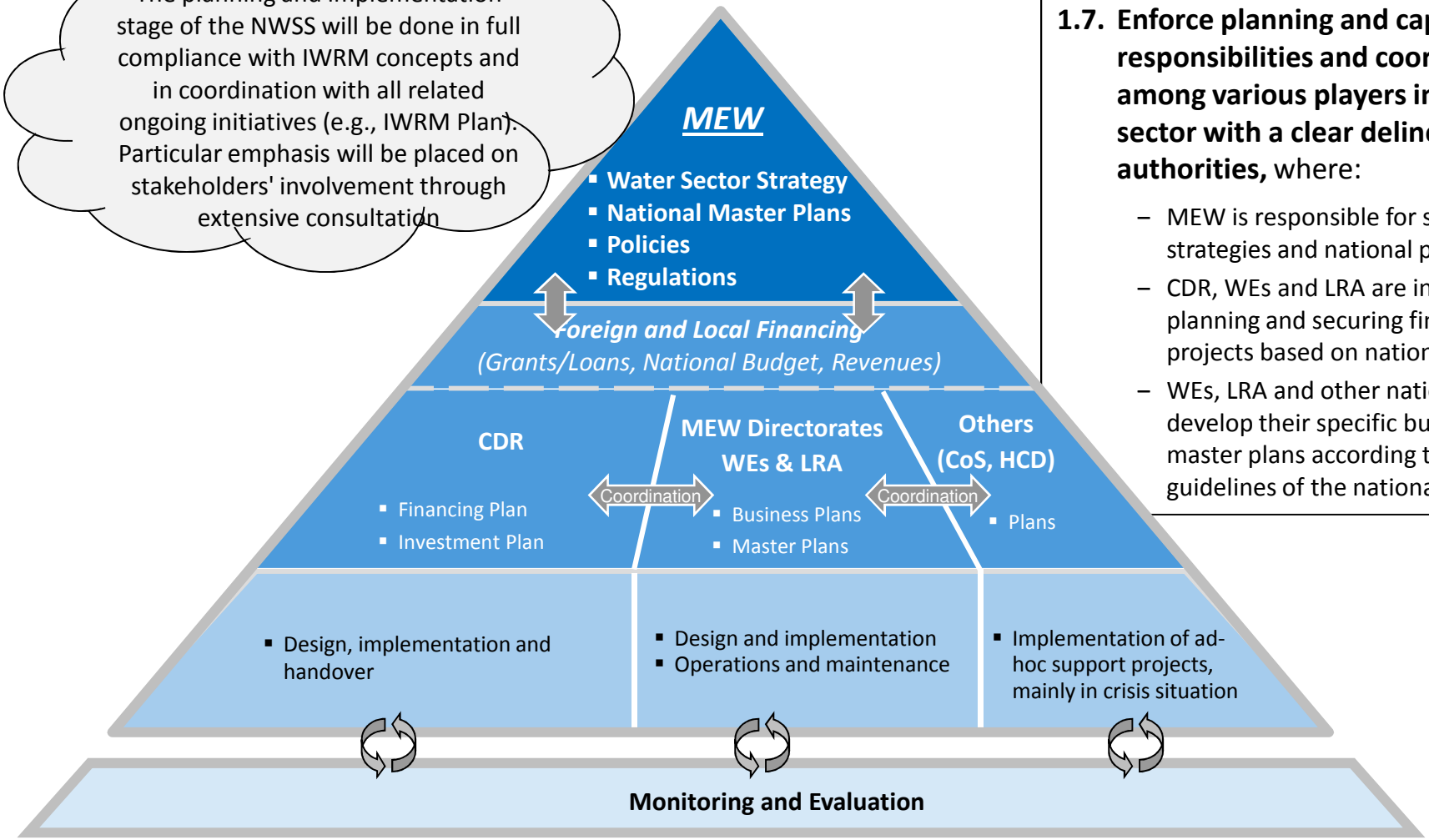
- Assess possibilities for transfer form other entities
- Screen CVs and valuate potential candidates for required position
- Conduct interview, evaluate and communicate decision

Training

- Generate an up to date training course list for use in the training needs
- Develop training budget, curricula & calendar
- Provide training courses
- Complete the course evaluation s and provide feedback

Allocation of planning and capital spending responsibilities among the various players in the sector will be clearly defined

The planning and implementation stage of the NWSS will be done in full compliance with IWRM concepts and in coordination with all related ongoing initiatives (e.g., IWRM Plan). Particular emphasis will be placed on stakeholders' involvement through extensive consultation

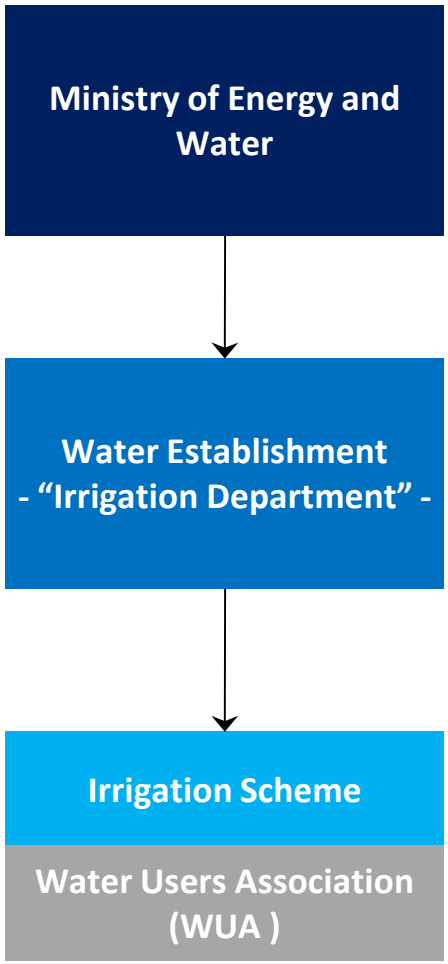


Initiative # II.1 (Cont'd)

1.7. Enforce planning and capital spending responsibilities and coordination among various players in the water sector with a clear delineation of authorities, where:

- MEW is responsible for setting policies, strategies and national planning
- CDR, WEs and LRA are in charge of planning and securing financing of capital projects based on national plans
- WEs, LRA and other national entities develop their specific business plans and master plans according to policies and guidelines of the national plan

The management of the irrigation sector will be addressed to ensure sustainability and improve cost recovery



- Water resource provision and allocation
- National irrigation master plan
- Policy making
- Large civil works

- O&M of main canals, intake structures and pumping stations often well above the farmers' capacities
- Assistance to WUAs in the O&M of irrigation schemes, especially those which are in bad state of repair

- O&M of scheme at the secondary and tertiary levels
- Collection of water fees
- Payment of fees to the WE responsible for providing the bulk water and other services
- Water quality management and pollution control

Initiative # I.1 (Cont'd)

1.8 Involve stakeholder participation in the design and management of projects to ensure sustainability according to best practices, through:

- Creation of formal Water Users Associations (WUAs) to replace the different organizations currently in charge of O&M of irrigation schemes
- Definition of roles and responsibilities with respect to water management (including water quality) of the WUAs and other partners, in close cooperation with the intended beneficiaries
- Providing well-focused training related to the establishment and management of WUAs to all involved parties

1.9 Improve irrigation water demand management and cost recovery, and sustainability of irrigation schemes, through:

- Adjustment of irrigation water tariffs to cover O&M costs at a first stage, and periodically review and adjust water tariffs to reflect actual costs (refer to Tariff Initiatives in next slides)
- Basing water charges on volume of water used rather than area. Where metering is not feasible at this time, base water charges on a combination of a fixed charge to cover the basic services, and other charges which can be used as a proxy for the volume of water used, such as crop grown and/or hourly use of water
- Carrying out periodic public awareness campaigns to inform policy makers and farmers of water shortages that could be faced, and the need for conserving irrigation water

Baseline

Demand/Supply Forecasts

Sector Enabling Environment

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Investment Plan

Strategic Roadmap

Tariffs structures will be reviewed to reflect value for real consumption and provide incentives for water saving

Key Highlights of Current Tariff Structures

Water Supply
- Lebanon is one of the very few countries still adopting a flat tariff structure
- Volumetric charges prevented by lack of meters
- Lack of volumetric charges limiting conservation incentives at the consumer level, and production/leakage reduction incentives at the WE level
- Increased reliance on expensive private providers

Irrigation
- The largest water consumer, with very limited metering, preventing volumetric charges
- Lack of awareness on water consumption and conservation
- High reliance on undeclared groundwater
- Collection not performed effectively by WEs

Wastewater
- Tariff not yet applied, leading to a lack of incentive for limiting pollution

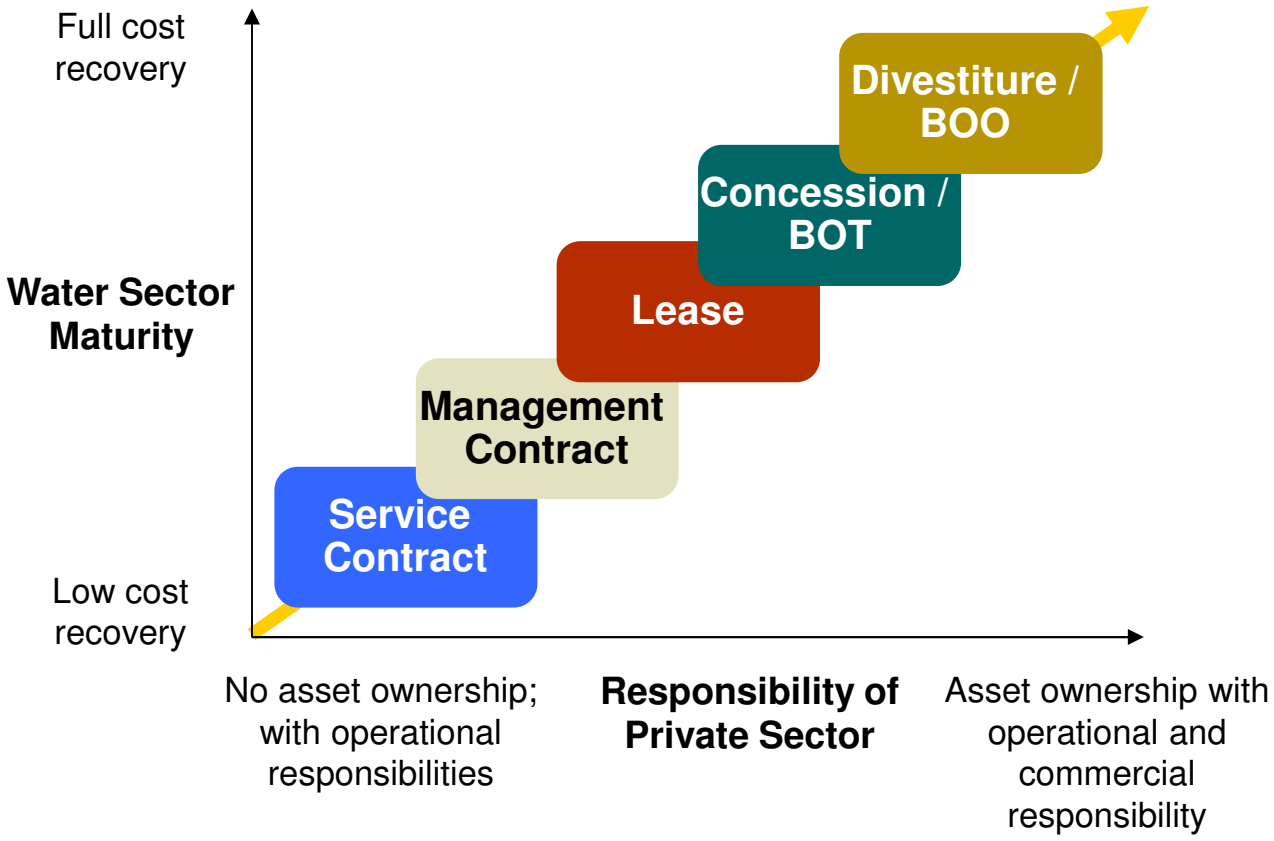
Initiative # II.2

2.1. Water Supply
- **Implement a new consumption-based tariff which includes fixed and variable (volumetric) charges for connections equipped with customer water meters**, where:
  - Current lump-sum tariff should be temporarily maintained for unmetered customers
  - No tariff increase would be introduced before concrete improvements are brought to the water sector (i.e. 2014)
  - Any future tariff increase should be based on a proper cost analysis to cover, at a minimum, O&M cost in 2014 as a first stage

2.2. Irrigation
- **Design and implement alternative irrigation tariff structures based on the specificities of existing and projected irrigation schemes**, where volumetric metering would be the preferred solution wherever possible

2.3. Wastewater
- **Apply a new wastewater tariff to customers connected to a sewer network and to a WWTP**, where:
  - New tariff should be based on a proper cost analysis and cover at a minimum O&M cost in an intermediate stage, with an introductory tariff initially in pilot areas where full service (collection and treatment) is available
  - Wastewater charges to be introduced as a percentage of water bill

Different options for Private Sector Participation (PSP) will be considered according to sector maturity



Highlights

- Given the current efficiency levels and low tariff collection, Management Contract would be a common starting point for PSP in the downstream sub-sector. It would prepare WEs for more advanced forms of PSP
- Production/ Upstream is typically a more mature sub-sector and is suitable for more advanced PPP schemes (e.g., dams, WWTPs)

While PSP is likely to be one of the main enablers of improvement, it should be supported by a holistic reform approach

1. **Select and implement suitable PSP approach**
   - Introduce private sector to increase efficiency, improve service and ensure continuous and general access to quality water
2. **Review water sector policies**
   - Review policies related to water usage and resources, tariffs, water quality and environment, and investment climate
3. **Improve Institutional Setting**
   - Review role of existing institutions
   - Design new institutions to support PSP and reform initiatives
   - Restructure and reorganize institutions

A number of shortcomings need to be addressed to ensure success of PSP initiatives

Key Lessons Learnt

- Lebanon still lags behind a number of countries in the MENA region who have already an experience in PSP
- The legal framework governing PPP activities in not yet ready
- While PSP is likely to be one of the main enablers of improvement, it should be supported by achieving a holistic reform and a sound enabling environment
- The participation of the private sector is seen as an enabler to incorporate know-how and fresh capital
- Given inefficiency and low tariff collection, Management Contracts would be a starting point for PSP in the downstream sub-sector. It would prepare the sector for more advanced forms of PSP
- Production/ Upstream is suitable for more advanced PSP schemes (e.g., BOT)

Initiative # II.2 (Cont'd)

2.4. Provide support in developing the adequate legal institutional and regulatory setting to promote PSP, in a way to ensure the interests of the Government and the Lebanese population, and provide an attractive environment to the private sector, through:

- Finalizing legal texts, existing or under development and developing any additional legislation
- Ensuring needed approvals from relevant authorities

2.5 Ensure the readiness of the water sector from all aspects (e.g., institutional, organizational, financial, legal and regulatory) to guarantee the success of future transactions *(this initiative is addressed throughout this strategy document)*

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Strategic Roadmap

The “Code de l’Eau” currently under development needs to be finalized and effectively implemented and enacted

Key Components of the Water Code

- Recognition of the main legal principles prevailing actually in the field of water:
  - the sustainable management
  - the right of each citizen to receive water
  - the determination of the missions of the Public Authorities to provide drinking water, the treatment of wastewater, the fight against flood, drought and pollution
- Introduction of a National Water Council including the representatives of the main authorities in charge or concerned by the water sector
- Implementation of a Water master plan to guarantee the realization of water and wastewater infrastructure
- Recognition of the administrative, environmental economic and financial requirements of water resource management
- Determination of the utilization of water including the legal possibilities to Private Sector Participation

Initiative # II.3

3.1. Produce the final version of the draft Water Code and follow up the process for its effective implementation and enactment, through:

- The approval of the Ministry of Energy and Water
- Discussion and adoption by the Council of Ministers
- Transfer by decree to the Parliament for final approval and implementation

Legal requirements stemming from the implementation of the NWSS will be identified and executed

Key Legal Highlights

- Lebanon is endowed with a tested 80 years-old body of legislation in this field of water and related issues
- In recent years, the water sector in Lebanon, albeit vital for socio-economic development, has been the object of few structural legal changes
- The modernization and updating of the legislation do not necessarily imply a complete juridical overhaul of the legal principles, but rather, a more comprehensive method of drafting based on advanced juridical, socio-economic and scientific analysis

Initiative # II.3 (Cont'd)

3.2. Strengthen the legal framework in order to improve the performance of the delivery of water and wastewater services and support the implementation of the proposed strategic initiatives, including:

- Improvements to current organizational bylaws of WEs
- Development and enactment of new organizational law for MEW's restructuring
- Reevaluation of some provisions of law 221/2000 and amendments in view to strengthen the capacities of the management and to provide better performance to the end users
- Establishment of an efficient regulatory framework
- Setting of a transparent tariff structures
- Development of a wastewater collection and disposal regulations
- Improvement of irrigation regulation bylaws
- Providing adequate legal environment to promote private sector participation
- Development of performance based incentives (e.g., procurement framework,)
- Ensuring normal access to potable water and sanitation including requirements for a proper implementation of operational and quality standards

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- **Environmental Concerns**

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Strategic Roadmap

Knowledge on climate change and its implications on water resources and its vulnerability will be improved and refined

Indicative

		Anticipated Trends	Projected Variations
Temperature		↗	1 °C on the coast and 2 °C inland by 2040 3 °C on the coast and 5 °C inland by 2090
Evapotranspiration		↗	Beirut: 1% by 2044 & 2% from 2044 to 2098 Cedars: 5% by 2044 & 8% from 2044 to 2098 Zahleh: 26% by 2044 & 10% from 2044 to 2098
Precipitation		↘	Between 10% & 20% by 2040 Between 25% & 50 % by 2090
Snow	Snow width	↘	50% with 2 °C warming, & mean width ~20cm (i.e, Cenomanian plateau of Nahr Ibrahim 2,000m altitude)
	Snowpack altitude	↗	1,500 - 1,700 m with 2 °C warming 1,700 - 1,900 m with 4 °C warming
	Snowpack volume	↘	1,200 - 700 MCM with 2 °C warming 700 – 350 MCM with 4 °C warming
	Snowing period	↘	Begin – end of each season reduction 1 – 3 weeks
Surface Runoff		↗	
Infiltration (Recharge)		↘	
Water Resources		↘	6 to 8% with 1 °C warming 12 to 16 % with 2 °C warming

More Predictable

Predictability

Less Certain

Initiative # II.4

4.1. Improve / refine climate change knowledge, and particularly its implications on the water sector and its vulnerability (i.e. refinement of models and figures):

- Collect, analyze and develop trends for climatic data (precipitation and temperature) covering all Lebanon, to compare with historic data and detect possible deviations
- Establish a unified database to include all water monitoring data and maintain it regularly updated
- Develop and implement long-term river, spring and snow cover monitoring programs
- Update periodically water usage scenarios and thus water management options

Source: MoE, UNDP

Water, wastewater treatment and effluent quality will be improved, and flood mitigation arrangements developed and enforced

	Current situation
Water Resources Surface and Groundwater	▪ **Groundwater pollution:** – Increasing salinity – Contamination by nitrates & pesticides ▪ **Surface water pollution:** – Bacteriological contamination – Chemical contamination (excessive use of fertilizers, direct discharge of industrial effluent, olive oil residues, open dumping) ▪ **Permanent sources of pollution** (n=82) along 225 km of coast (wastewater discharge, chemicals, oil residues, turbid water, warm water and dumps/landfills) ▪ **Limited protection of water resources/ recharge zones** ▪ **Damages from flash flooding:** cost up to 2.5 million USD dollars per event (e.g. 2001 flood in Hermel region)
Usages Potable Irrigation Industrial	▪ Drinking water Standards (1999): decree # 1039 ▪ Drinking purposes, swimming purposes and aquatic life (1996): MoE decision 52/1 ▪ Water quality mostly unknown at user level (water provided from WEs or alternative water sources) ▪ Monitoring data is scarce and situation poorly monitored ▪ Monitoring of irrigation water quality quasi absent
Wastewater	▪ Standards for wastewater discharge set in 2001 (MoE decision 8/1) ▪ Coverage of wastewater network (~60 %) ▪ Wastewater treatment (~8%) ▪ Draft standards for sludge reuse set in 2010 ▪ Draft standards for wastewater reuse in agriculture set in 2010

Initiative # II.4 (Cont'd)

4.2. Improve water quality and protection of recharge zones:
- Review and upgrade water quality standards
- Take actions to protect against contaminants that may be found in drinking water
- Design and implement a comprehensive integrated surface & groundwater quality monitoring network
- Develop a implement a concept for protecting recharge zones
- Centralize data and ensure communications with the consumers
- Design and implement an integrated monitoring system for irrigation water quality

4.3. Develop flood mitigation arrangements:
- Establish a flood plain zoning
- Develop an integrated flood management plan
- Assess the potential use of flood water for groundwater recharge
- Support initiatives aiming at combating desertification

4.4. Improve wastewater treatment and effluent quality:
- Review and update wastewater treatment and effluent standards
- Review and adopt draft standards for wastewater reuse in agriculture & sludge reuse
- Implement wastewater effluent monitoring systems

Source: MoE, UNDP

A Strategic Environmental Assessment (SEA) will be conducted to ensure environmental concerns are addressed and resolved

According to the World Bank, the cost of environmental degradation: ~ 1% of GDP

SEA – Main Steps

Screening	Does the proposed strategic action affect the environment?
Scoping	What are the driving forces/issues/ components that should be addressed?
Stakeholder involvement	Were the opinions of affected groups taken into consideration?
Performing the assessment	Were the potential impacts identified & assessed?
Submission of SEA report	What documents & data need to be included & presented in an objective manner?
Peer review & integration of SEA finding	Were the original set objectives fulfilled & were the stakeholders feedback accounted for?
Decision making	To decide on the proper environmental arrangements regarding the proposed strategy
Monitoring & Quality assurance	Did SEA influence decision and result in greening public decisions?

Source: MoE, UNDP

Initiative # II.4 (Cont'd)

4.5. Evaluate environmental consequences of the proposed NWSS (Strategic Environmental Assessment) to ensure they are :

- fully included
- addressed appropriately at the earliest possible stage of decision making on par with economic and social considerations