Role of Ministry of Energy and Water in National IWRM Planning

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Technological Tools and Financing Mechanisms for IWRM: Complementing Hydro-diplomacy &
Climate Change Adaptation Efforts
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Overview

- Water Resources Challenges in Lebanon
- Why IWRM Planning in Lebanon?
- Context for IWRM Plan
- The Planning Cycle
- MEW & IWRM Planning in Lebanon: Progress & Achievements
- IWRM Conceptual Framework
- Scope of the MEW DSS
- MEW Integrated DSS
- List of priorities for DSS
- List of priorities for IWRM
Water Resources Challenges in Lebanon

Freshwater resources are under increasing pressures due to various factors, among which:

- **Water pollution (from point and non-point sources)**
  - Influences the quality of water downstream
  - Reduces water availability
  - Has impacts on human health

- **Recurring drought periods with varied severity and length**
  - Loss of agricultural productivity
  - Land degradation and desertification

- **High urban population concentration**
  - Increased pressure on water demand and water pollution
  - High population growth rate would amplify the problem

- **Competing uses of the resources from different activities**
Water Resources Management Challenges in Lebanon

- Lack of reliable data on which Decision making should be based
- Overlapping responsibilities of institutions & stakeholders involved in water management
- Limited participatory approaches in decision making
- Competing uses of the resources from different activities
Why IWRM Planning in Lebanon?

- A **systematic process** that considers together all different uses of water resources and allows to take decisions related to water allocation and management considering the effects of each use on the others.

- A **strategic statement** that details a country’s actions toward to sustainable management of its water resources

- A **process** leading to a National IWRM plan elaborated, endorsed and implemented by all stakeholders (a participative process)
Context for IWRM Plan

- Link to other strategies and plans:
  - Other existing national plans/strategies
  - National MDG Strategies
  - National poverty reduction strategies
  - National 5 years plans
  - National sustainable development strategies
  - National biodiversity strategy and action plan
The Planning Cycle

- **Initiation.**
  - Government commitment.
  - Team formed.

- **Vision/policy.**
  - Commitment to IWRM.

- **Evaluation.**
  - Assess progress, revise plan.

- **Implementation.**
  - Legal, institutional, management actions.
  - Build capacity.

- **Situation analysis.**
  - Problems, IWRM situation, goals identified.

- **Strategy choice.**
  - Goals prioritised, strategy selected.

- **IWRM plan.**
  - Draft, stakeholder & political approval.

- **Work plan.**
  - Awareness raising.
  - Stakeholder participation.
  - Political commitment.
MEW & IWRM Planning in Lebanon
Progress & achievements
~ 15 years inspiring IWRM concepts and approaches:

- Revision of water Legislation (2000)
- MED EUWI Country Policy Dialogue on IWRM in Lebanon
  - Phase I (concluded in 2009)
  - Phase II (2010 - ongoing)
MEW & IWRM Planning in Lebanon
Progress & achievements

• The Water Code - a cooperation programme between the Lebanese and the French Government - aims to tackle within a comprehensive and integrated framework governance, institutional and management issues and recommends provisions for the implementation of sustainable management of water resources;

• The Water Code has been submitted to the Council of Ministers for approval.
Gathering political will and support for IWRM and the planning process;

A framework for broad stakeholder participation is being created;
IWRM Conceptual Framework - Lebanon

Data Inventory (Assimilation)
Hydrology, watershed physical and physiographic, climatic, water use/demand, water quality, water systems, agriculture, land use/cover, socio-economic, etc

Legislative Framework
Laws, Policies, Legislations, Regulations

Decision Support System (DSS)
Modeling / Analysis
WEAP

Database (Spatial and temporal)
Analysis (Spatial, GIS)

Planning, Management, Decision Making

Institutional Framework
Institutions, public involvement, NGO’s, etc

Communication
Endorsement

Monitoring System

Feedback
Acceptance
Scope of the MEW DSS

- Lebanon has 40 rivers and main water courses
  - 17 main river basins with a total area of around 8000 Km^2
  - ~75% of the country’s total area.
- Develop an integrated DSS model for major river basins (We have run the model for six basins: Hasbani, Orontes, Elkabir, Aljawz, Upper litani basin, Abou ali, Naher Elkalb)

- The DSS is intended to establish an integrated modeling approach that supports:
  - hydrologic analysis
  - assessment of Water Resources Use/Demand
  - water resources management
  - water resources planning
  - scenario evaluation
  - analysis of Alternatives
  - integration of Future Projections
  - water Quality Modeling
MEW Integrated DSS

**Decision implementation**
- Monitoring plan

**Decision making**
- Mitigation, adaptation, risk management, management plan, program of measures...

**Data assimilation (MEW Geodatabase)**
- Climate, Hydrology, water resources, water quality, socio-economic data...

**Model implementation and calibration**
- Hydrologic modeling (surface runoff, ground water recharge, ET, etc)

**Water Resources Modeling**
- Water demand/use

**Future Scenarios**
- Implementation of climate scenarios: Hydrologic forecasts, Future water resources forecasts

**Analysis**
- Evaluation and assessment of current and future conditions (identification of impacts/drivers), evaluation of different scenarios (e.g. climate change impact analysis)

**Water Quality Modeling**
- Assessment of major drivers and impacts
DSS Outcomes

- Limitation of water resources,
  - Competition between users
  - inadequacy in the water supply systems and water use
    - Deficiencies in the supply management, increased loss to the system
    - Deficiencies in irrigation practices (i.e. Surface irrigation/ cropping patterns)
      - increasing unmet demands by all sectors
  - Lack of water reuse practices
    - Increased return flows (usually polluted)
- Future Projections
  - increased water demand by all sectors
    - Increased population, agriculture, and economical activities
    - Increased competition between users
    - Increased unmet demands by all sectors
  - Climate change projections
    - Recurring drought period with varied severity and length
      - Impacts agricultural practices in the inland areas and population demand in coastal zones
  - Increased urban population concentration
  - Increased pressure on water demand
List of priorities for DSS

- Major focus should be made on the analysis water demands and scenarios for all Lebanese Basins;
- In depth analysis of drivers/impacts
  - Identification water resources problems (use/supply, water quantity/quality):
    - Population growth, Irrigation development, Ground water abstraction, Drought, Climate change, etc;
- Extend the DSS to accommodate:
  - Water quality and pollution tracking
  - Water socio-economy
- Formulation of IWRM program of measures and strategies.
List of priorities for DSS

- Hydrologic Analysis
- Assessment of Water Resources Use/Demand
- Water Planning and Management
- Evaluation of Scenarios
- Analysis of Alternatives
- Integration of Future Projections
- Water Quality Modeling

• completed
• Projected
List of priorities for DSS

- **Water planning:**
  - Population growth
  - Water scarcity and water allocation
  - Water supply (e.g. Urban, Irrigation)
  - Socio-economic considerations
  - Drought/ Climate Change
  - Depletion of water sources (e.g. aquifers)

- **Water management:**
  - Expansion/ change in agricultural practices
  - Decline of water quality (i.e. pollution)
  - Waste water management
MEW Data Sharing Insights

- IWRM, what about data sharing?

- Outputs from the DSS and processed Data from MEW database!

- The MEW (DSS) is sought to provide information in the following areas:
  - Water demand/analysis
  - Hydrologic simulations (e.g. surface runoff, ground water recharge, ET, GW/SW interaction, etc)
  - Water demand/use and hydrologic forecasts
  - Climate change impact analysis
List of priorities for IWRM

- Involve stakeholder participation in decision making
- Develop of Water Resource Management Plan
- Develop a set of Program and Measures
- Develop a Comprehensive Monitoring Plan
Thank you