

The Damour River Basin - Lebanon Case Study



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LEBANON

Overview of Lebanon Water Resources

- In the Middle East where water resources are becoming more scarce, Lebanon remains so far blessed with relatively more water in comparison with its neighboring countries.
- However, the increasing pressures on Lebanon water resources require the formulation & implementation of a comprehensive management plan to meet future water demands and challenges.
- In the frame of INECO project, Damour River Basin was selected as a template to focus on focal water management problems & highlight on problems mitigation efforts and solutions.

Damour River Basin in a Glance

- Damour is a coastal village located 20 km south of Beirut with a population of 76'000 inhabitants
- Damour which originally had an agriculture profile, has become starting from the 1990 an important touristic area with the proliferation of beach resorts along its coast
- The DAMOUR RIVER BASIN area (333 km²) enjoys abundant surface & ground water resources compared to other basins in Lebanon.

The Water Management Issue

Previous investigations, researches and analysis carried out on water resources and the field work within INECO project helped to reveal the following focal problem :

Description of WM Problem

Damour River Basin is facing a decrease in the total amount of surface & ground water of adequate quality necessary to serve the needs of its different domestic, agriculture & industrial users.

This situation has led and is still leading to implications of multi facets & levels :

Social Implications : increase in social cost, increase in local conflicts, stress on water demand

Environmental Implications : increase in health problems due to pollution

Economical Implications : increase in desertification of agricultural area, limited financial resources to improve situation

The Causes of Water Management Problem

The major Causes behind decrease & inadequate quality can be summarized as follows:

- ✓ Drop in precipitation levels
- ✓ Over exploitation of ground water & surface water sources
- ✓ Uncontrolled discharge of waste from domestic & industrial sources
- ✓ Inter basin transfer of ground water
- ✓ Sea water intrusion to groundwater
- ✓ Limited capacities of authority
- ✓ Limited financial resources

Current Effort For Problem Mitigation

- ❑ Sincere efforts are being made to mitigate the water problems not only in the Damour region but on national level

Currently applied measures by authorities :

- Creation of 4 new autonomous water boards whose tasks entail the management, the operations & the maintenance works
- Damour River Basin operations were entrusted to Beirut & Mount Lebanon water authority
- Damour municipality & neighboring municipalities have started beginning 2008 to enforce subscription to water networks including annual fixed fee per m³/day

Currently applied institutional and economical responses

- In Damour River Basin, collection of charges is entrusted to municipalities whilst it is normally executed by Water Authority in other regions (decentralization measure)
- Water charges are collected separately
- Unique tariff employed
- Water extraction permits are subject to drastical conditions.

The Reasons behind Success & Failure

- The Lebanese law governing the water sector dates back to Ottoman & French regime. The significance of sustainable water management urged policy makers to develop new laws
- However political, social & economical instability has dramatically impeded authorities to stop illegal wells
- Interbasin transfer activity is still increasing and quantities are threatening the Damour Basin aquifers
- Some zones of the studied area are declared protected upstream the Damour River & water wells are restricted in these zones. However, economic consequence of this measure is the high cost of expropriation in the area.

The Reasons behind Success & Failure (cont.)

- Poor cost recovery: difficulties for municipalities & water authorities to recover operational maintenance cost
- Inexistence of environmental supervision from tutorial institution
- Excessive quantity of water committed for inter basin transfer rendering Damour area more vulnerable

Key Policy Objectives

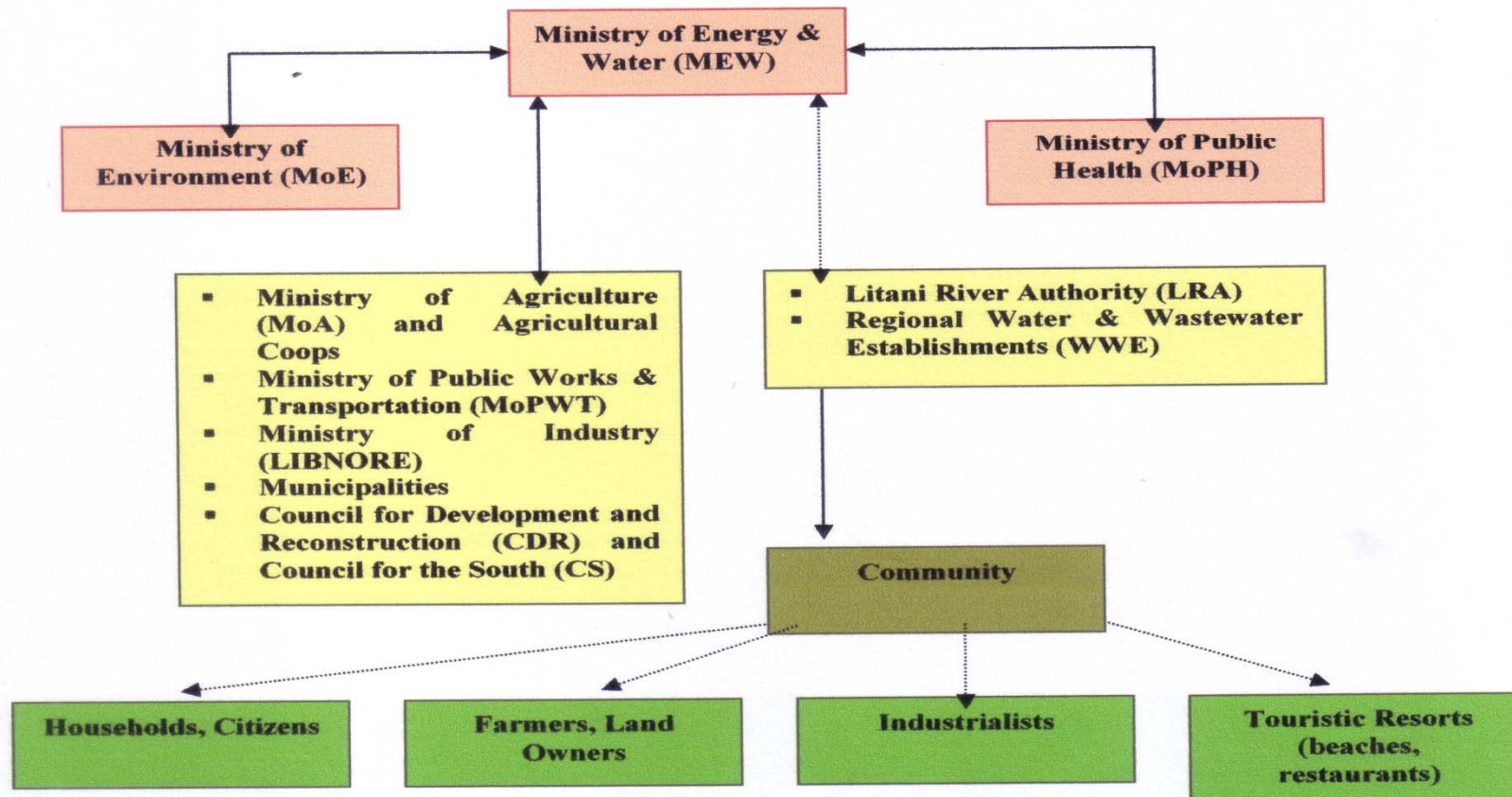
- The consultation meetings & workshops held with various categories of stakeholders within INECO project, helped to set the key policy objectives articulated around 4 main elements :
- 1. Securing necessary quantity & adequate quality of surface & ground water
- 2. Rehabilitating infrastructure & reinforcing the monitoring & control capacity of institutions dealing with WM
- 3. Preventing water pollution
- 4. Allocating water resources on basis of joint agreement & comprehensive socio-economic survey & analysis of water use

Process & Stages Followed

- We implemented a participatory approach with stakeholders to reach consensus on options suitable for all
- The process comprised :
 - 20 meetings with stakeholders
 - 2 seminars and 1 workshop
 - Surveys, discussion fora, dedicated questionnaires, etc.
- Stakeholders & concerned citizens participated in the debate on water problems, proposal on objectives & alternative solutions
- Several categories of stakeholders are involved in the water management problems and have direct or indirect relation & impact and are affected by water problems

Process & Stages Followed

Stakeholders Chart



Identified Instruments & Priorities for Problem Mitigation

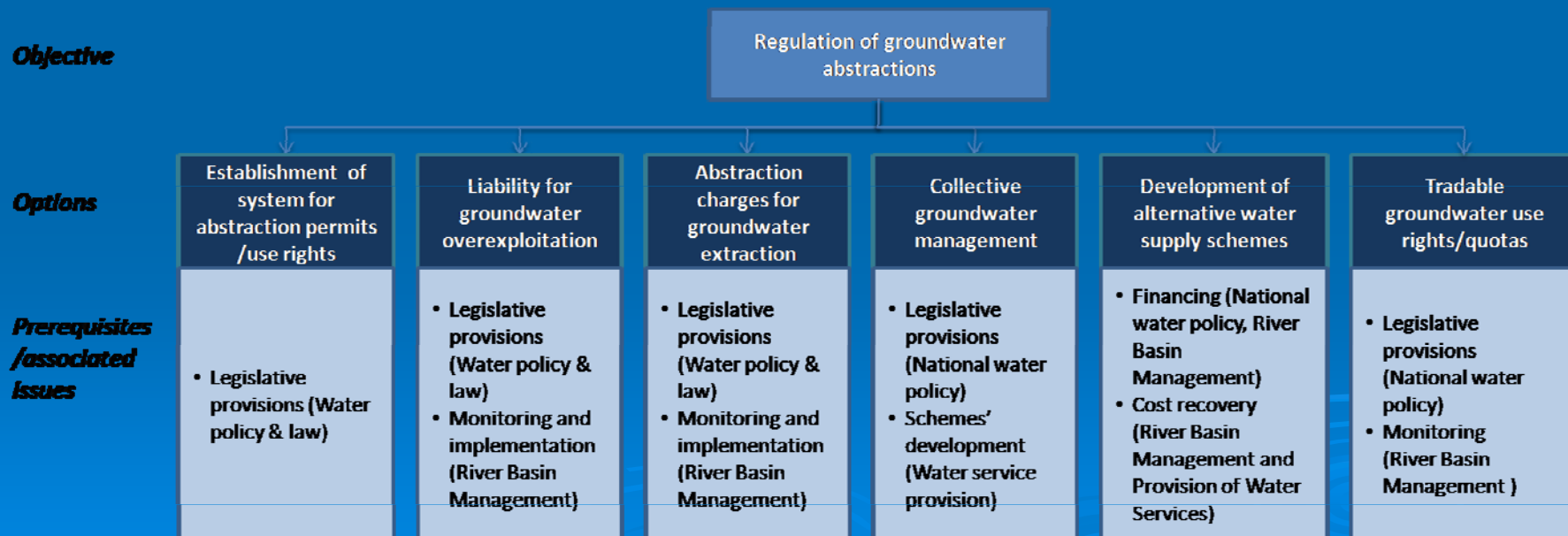
- Identified issues were discussed with local stakeholders in accordance with the objectives already defined, and pertained to 3 main functions :
 - a. Water service provision (Operational Level)
 - b. River basin level/Aquifer management (Organizational Level)
 - c. National water policy & law (Constitutional Level)

Identified Instruments & Priorities for Problem Mitigation (cont.)

▶ Regulation of groundwater abstractions :

Issue considered a key objective by all stakeholders & decision-makers

Suggested options for this issue :

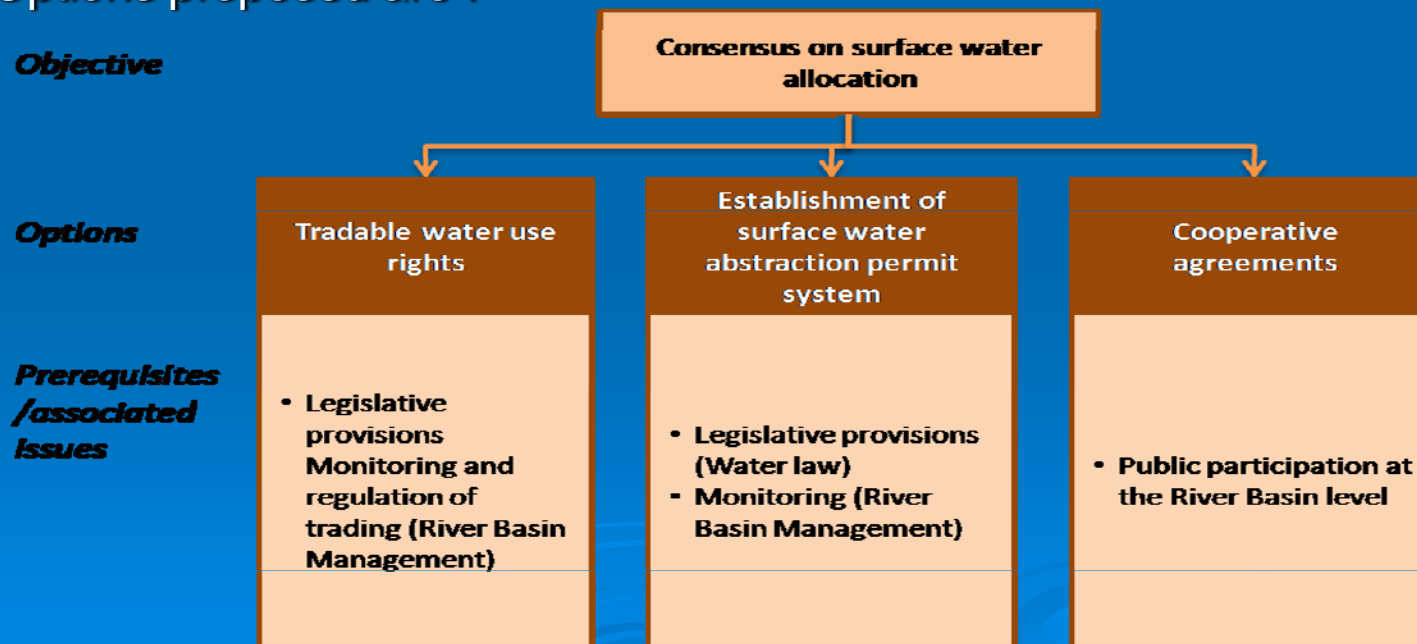


Identified Instruments & Priorities for Problem Mitigation (cont.)

- ▶ **Concerning control of industrial & domestic pollution:**
 - No heavy industrial activity in Damour area
 - There is Uncontrolled discharge of industrial wastewater from small manufacturing & other facilities
 - Implementation of effluent charge systems is not considered applicable given the institutional framework

Identified Instruments & Priorities for Problem Mitigation (cont.)

- ▶ **Reaching agreement on surface water allocation:**
Allocation of water of the Damour River is an issue of conflict among upstream & downstream users.
- Options proposed are :

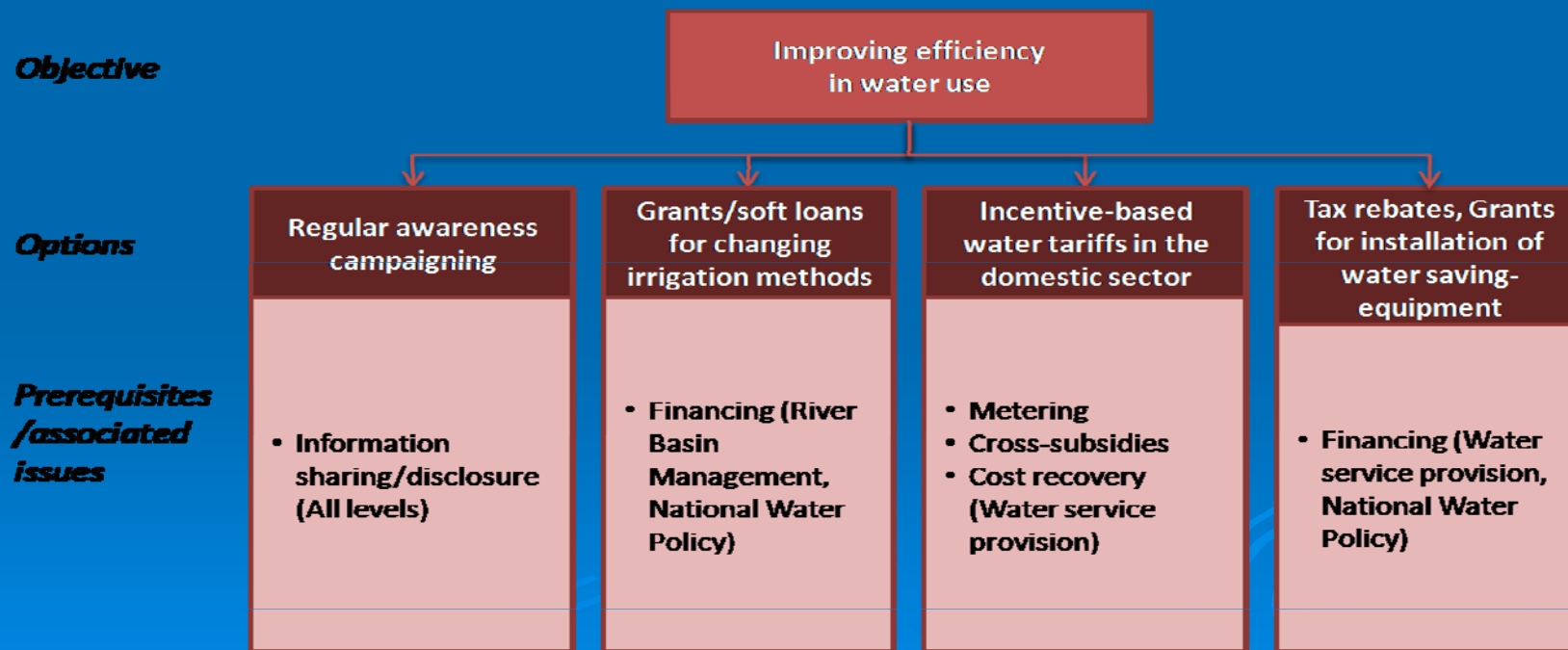


Identified Instruments & Priorities for Problem Mitigation (cont.)

► Improving efficiency in water use :

This issue is a key objective broadly recognized by all parties consulted.

➤ Suggested Options are :

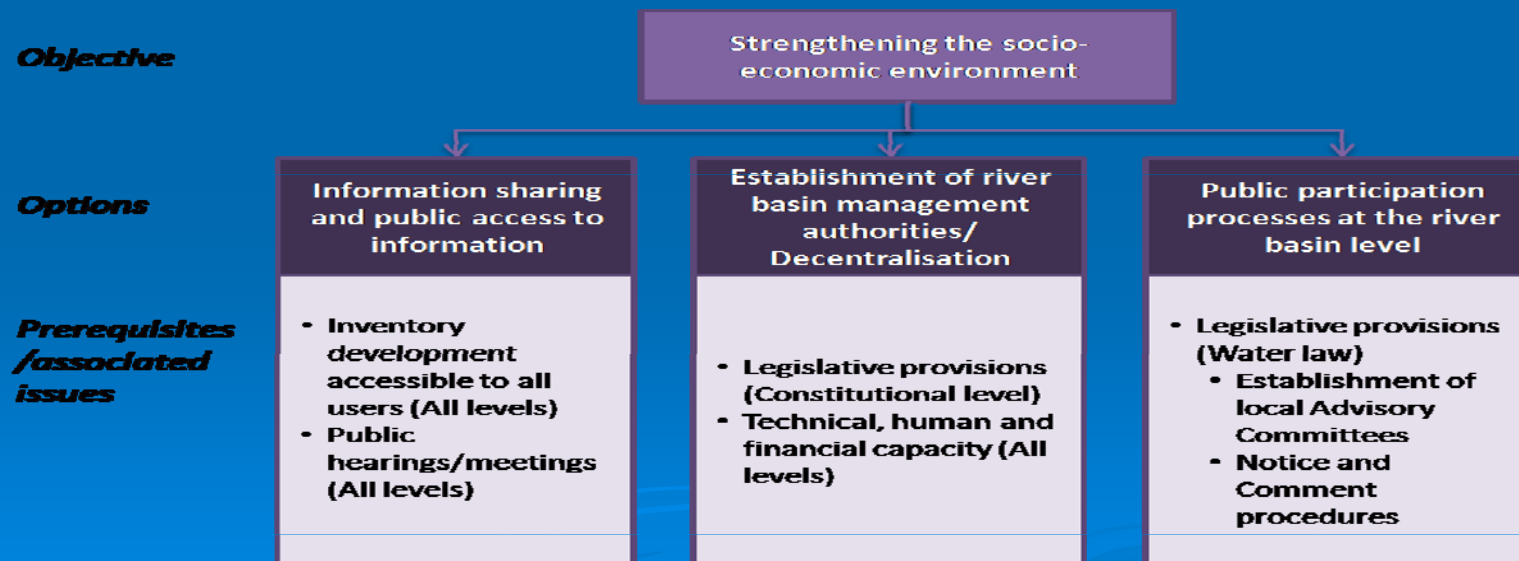


Identified Instruments & Priorities for Problem Mitigation (cont.)

▶ **Strengthening the socio-economic & institutional environment :**

This is a key issue to support the implementation of all other instruments.

➤ Suggested Options are :



Identified Instruments & Priorities for Problem Mitigation (cont.)

- ▶ **Prioritization of suggested instruments :**
 - Instruments that seemed to be most relevant & applicable comprise:
 1. **Water pricing:** does not seem problematic, consequently installation of water meters will be accepted by local community
 2. **Tariff structure:** could be revised without any excessive increase
 - Industries, beach resorts would be subject to volumetric pricing
 - Fixed charge could be applied on households & farmers
 3. **Discharge permit system:** definition of technology standards, enforcement of relevant penalties & sanctions would be acceptable
 4. **Decentralization:** is regarded as prerequisite for effective implementation of management options & development policies
 5. **Building dams**
 6. **Public participation:** is strongly supported

Identified Prerequisites for Implementing Prioritized Options

- Evaluating potential policies for mitigating water stress was complemented through mapping perceptions & sharing views on prerequisites.

- The outcomes of this stage elaborate issues related to:
 - ✓ Cost recovery & cost sharing
 - ✓ Framework for water management
 - ✓ Means for regulating abstractions, preventing pollution & incentivizing water conservation
 - ✓ Ways of enabling public participation & involvement in decision-making.

Identified Prerequisites for Implementing Prioritized Options (cont.)

▶ **Cost recovery & cost sharing issues :**

- Stakeholders believe that current system for costs recovery & water tariffs is not transparent enough and consider that currently water tariffs are high compared to the quality of water services

▶ **Framework for Water Management :**

- Majority of respondents indicated that current water supply cannot adequately respond to their growing challenges
- Private sector involvement can be seen as alternative
- There is need for transparent procedures & for strict control of all operations by the government.

▶ **Regulation of abstractions & discharges :**

- Stakeholders interviewed underlined the pertinence of potentiating command-and-control regulatory measures
- They do not consider that the government is sufficiently empowered & has the political willingness to do so because of lack in efficiency, transparency & trust in the system

Identified Prerequisites for Implementing Prioritized Options (cont.)

▶ **Incentives towards water saving :**

- Respondents are reluctant to accept an increase of water tariffs
- Levying of dedicated taxes receives little support
- Respondents consider that water saving standards should be mandatory for new buildings & new irrigation projects

▶ **Approaches to industrial pollution prevention & control :**

- Majority believes that the industrial sector should be supported in the transition phase
- Levying of dedicated taxes to polluters is widely accepted
- Stakeholders are sensitized to reward industries that undertake significant efforts to reduce pollution
- Training, education & technology transfer are required for the modernization of the Lebanese Industry

Identified Prerequisites for Implementing Prioritized Options (cont.)

- ▶ **Water Conservation in irrigated agriculture :**
 - Reduce water use in the agricultural sector
 - Governmental support is required for modernizing agriculture, encourage change of cropping

- ▶ **Public involvement and participation :**
 - Interviewees stressed the importance of participatory approaches in promoting democratic management & accountability

Conclusion

The Impact of INECO Project

- The importance of INECO project lies in the “Participatory Approach” adopted to tackle the Water Management problems and issues
- The Participatory Approach induced a true participation of stakeholders from various categories
- It permitted to :
 1. Highlight and detail Water Management problems
 2. To air stakeholders grievances & complaints
 3. Facilitate the reach to key objectives in problem mitigation

What Lessons Derived ?

- The will & readiness of the general public to participate, give opinions, elaborate solutions because of the growing awareness & concern
- Solutions put forward are reachable & adaptable to other regions in Lebanon
- Solutions require political & financial clearance to survive
- Solutions suggested or implemented in other countries (Tunisia, Morocco) could be adapted to Lebanon
- Participatory approach should be adopted in the treatment of other national or transnational problems.

**THANK YOU
FOR
YOUR ATTENTION**