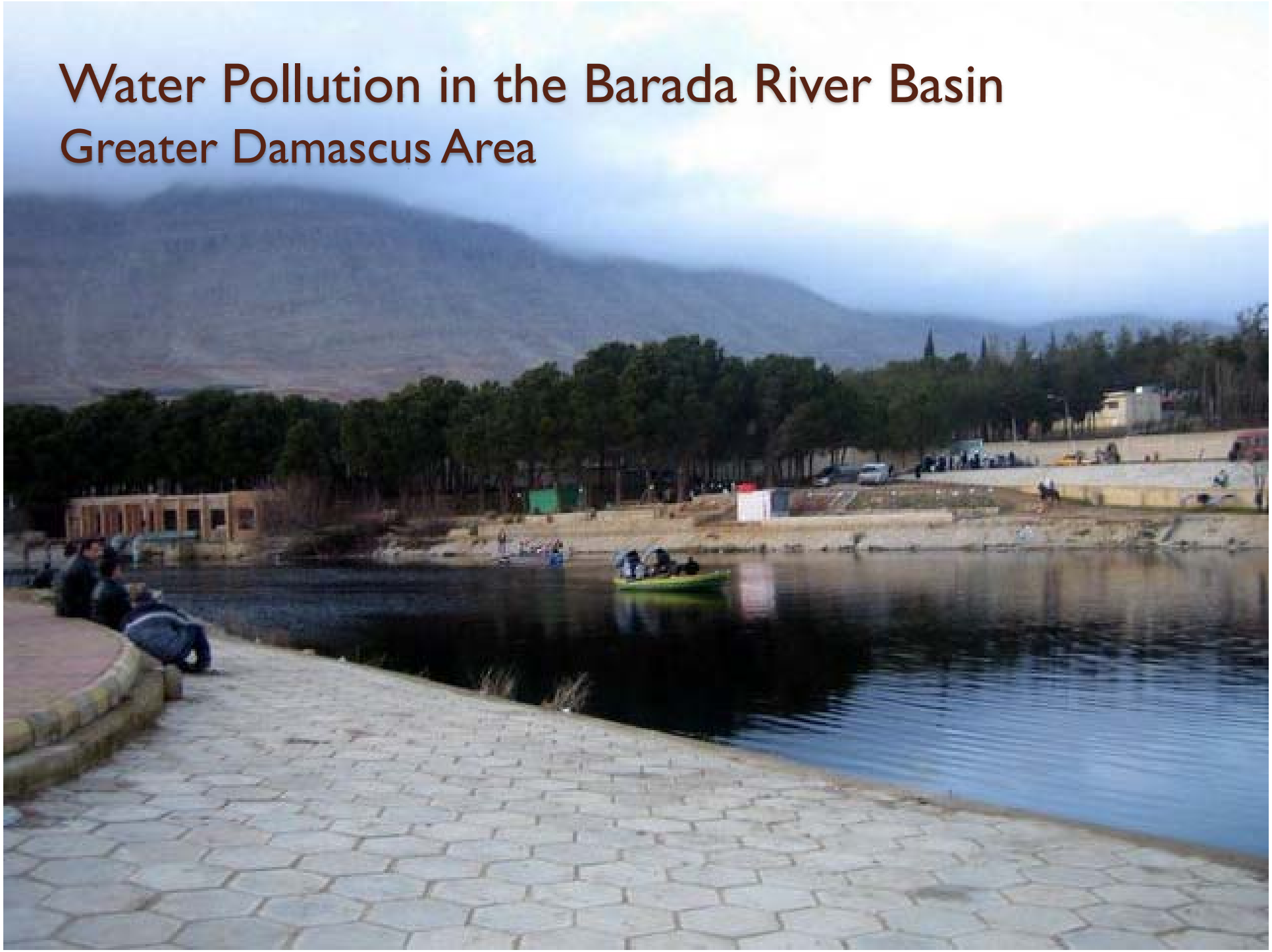
Water Pollution in the Barada River Basin

Greater Damascus Area



Overview of the Basin

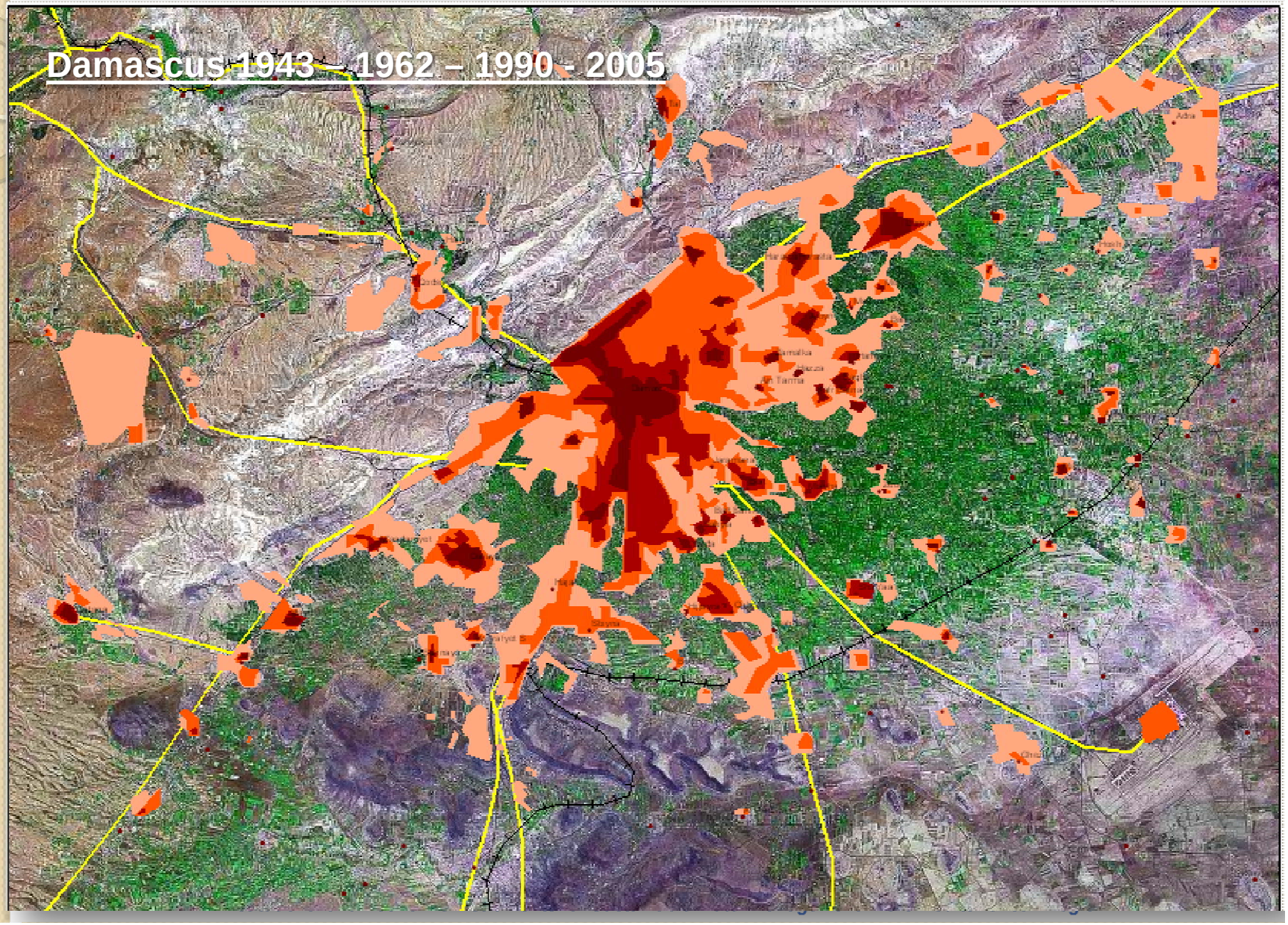
84 Km

Population 6 Million

Increasing Rate 2.4%

Overview of the Basin

Water Pollution in The Barada River Basin



Water Pollution in the Barada River Basin

Causes

The discharge of high loads of domestic waste and wastewater.

One drainage pipe pours water in the river
1200 m from the Barada Spring, Zabadani Area, Feb 2008

A branch of the river and seemed completely dry, which accumulate dirt, Sep 2007

Water Pollution in the Barada River Basin

Causes

The discharge of high loads of industrial waste and wastewater.

Polluted water in the tanneries area
Mar 2008

Polluted water in the Marble Factories area
Mar 2008

Water Pollution in the Barada River Basin

Causes

Excessive and irregular using of fertilizer and pesticides by farmers.

Using wastewater for irrigation.

Al Ghouta
Mar 2008

Barada Valley
Feb 2008

Water Pollution in The Barada River Basin

INECO

Nicosia 11th June 2009

Institutional and Economic Instruments for Sustainable Water Management in the Mediterranean Region

Water Pollution in The Barada River Basin

INECO

Nicosia 11th June 2009

Water Pollution in The Barada River Basin

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Institutional and Economic Instruments for Sustainable Water Management in the Mediterranean Region

Water Pollution in the Barada River Basin
Effects

Use of untreated wastewater for irrigation

Groundwater contamination.

Loss of valuable biodiversity.

Poor water quality.

Deterioration of life quality.

Increased illness and morality.

Higher costs for the production of safe water (for drink and agriculture).

Lower income from tourism.

Water Sector

The Ministry of Irrigation and its directorates are responsible for administrating developing water resources, regular monitoring of surface and ground water quality and ensuring the availability of water resources for irrigation purposes. The ministry of irrigation is also responsible for controlling drilled wells, and for licensing future wells.

The Ministry of Agriculture and Agrarian reform is responsible for the economic uses of water for agriculture purposes. This include the provision of modern techniques for water savings, and cultivating crops with lower water demands.

The Ministry of Housing and Utilities is responsible for the drinking water distribution networks in urban and rural areas and for domestic waste water treatment.

The Ministry of Local Administration and Environment is responsible for monitoring and controlling water quality, and for issuing national standards for the protection of water resources.

Overview of the institutional and economic settings in Syria

The Tariff system:

	2001 – 2007		1/11/2007			
Sector	**Previous Water Consumption Layer (m^3)**	**Previous Tariff Rate S.P./m3**	**Consumed water (m^3)**	**Tariff S.P./m^3**	**Sewage Rate as % from water tariff**	**Sewage Minimum and Maximum Tariff (S.P.)**
Household	1-20	3= (0.04E)	1–15	2.5=(0.03E)	5%	Min. 30=(0.42E) Max. 530 = (7.46E)
Household	21-30	4.5= (0.06E)	16–25	7=(0.09E)	10%	
Household	31-60	13.5=(0.19E)	26 – 40	15=(0.21E)	15%	
Household	Over 60	19=(0.26E)	41-60	22=(0.3E)	20%	
Household			Over 61	30=(0.42E)		
Governmental agencies		8.5=(0.11E)		14=(0.19E)	55%	Min. 38=(0.53E) Max. Unlimited
Industrial, commercial and tourism sectors		22=(0.3 E)		30=(0.42E)	40%	Min. 38 (0.53E) Max. Unlimited

Overview of the Institutional and Economic Settings in Syria

For agriculture sector, the farmers should pay a fix amount of money for each hectare every year, with disregarding to the kind of crops.

For **legal industry** they should pay 30 S.P. for each m^3, and 40% of their total bill for wastewater treatment.

Many **illegal industrial** workshops in the basin, most of them are using water from the household network and pay only the minimum tariff, and some of them use the river water.

Current efforts to improve water management

The new legislation requires that tanning manufactures move from the river vicinity to the new industrial area of Adra (in northern Damascus). But…

Discussion is going on to find a good incentives to move many workshops and factories to the Adra Industrial City.

A good database for automatic water analysis is launched under the responsibility of Ministry of Irrigation.

A program for construction 30 small wastewater treatment plants in Damascus rural (around the river basin),

The government took decisions to push the farmers to use the modern technologies for irrigation. Non-interest loan for the farmers to move into modern irrigation technologies.

A plan to develop Adra wastewater treatment plant in order to make it ready to deal with industrial wastewater, and improve the out of this treatment plant..

Current efforts to improve water management

The Environmental Law and Water Law are very important steps to draw the legal framework for all other efforts.

The new water tariff is also good step to push people to save water.

The government try to activate the Water Users Associations, the new water law open the road to establish such associations but till now there role is completely absent.

The Establishment of the “Higher Institute for Water Management” is a very important step in order to undertaking research and scientific experiments,

A lot of awareness campaigns had took place in order to increase the awareness of farmers for many subjects, such as: modern irrigation methods, the dangers of using polluted water, nitrates effects, the excessive application of fertilizers and pesticides…

Reasons why these policies have been less successful

Lack of integration of functions between authorities. Overlaps in the allocation of responsibilities among the different parties.

Deficient application of economic instruments.

Lack of efficient monitoring systems.

Absence of the role of beneficiaries in water management

Lack of communication and data exchange between policy and decision makers.

Failure of the present policy to achieve capacity building in the water sector.

INECO Participatory process and outcomes

The INECO Workshop in Syria was held at September 10th 2007 with 54 participants from various ministerial departments, governmental agencies, regional authorities and NGOs.

The workshop aimed at strengthening the alliance between the INECO Project Team and Local Stakeholders, by providing a platform for constructively engaged dialogue on the mitigation of water pollution of the Barada River.

Stakeholders

Ministries and Governorates Authorities:

Ministry of Irrigation, Ministry of Agriculture, Ministry of Housing, Ministry of Local Administration and Environment, Ministry of Industry, Ministry of Tourism, Ministry of Finance, State Planning Commission, Ministry of Health.
Damascus Governorate, Damascus Countryside Governorate.

Other Scientific Bodies:

General Board for Water Resources (New), Higher Institute for Water Management (New), Atomic Energy Commission of Syria, Supreme Council of Sciences.

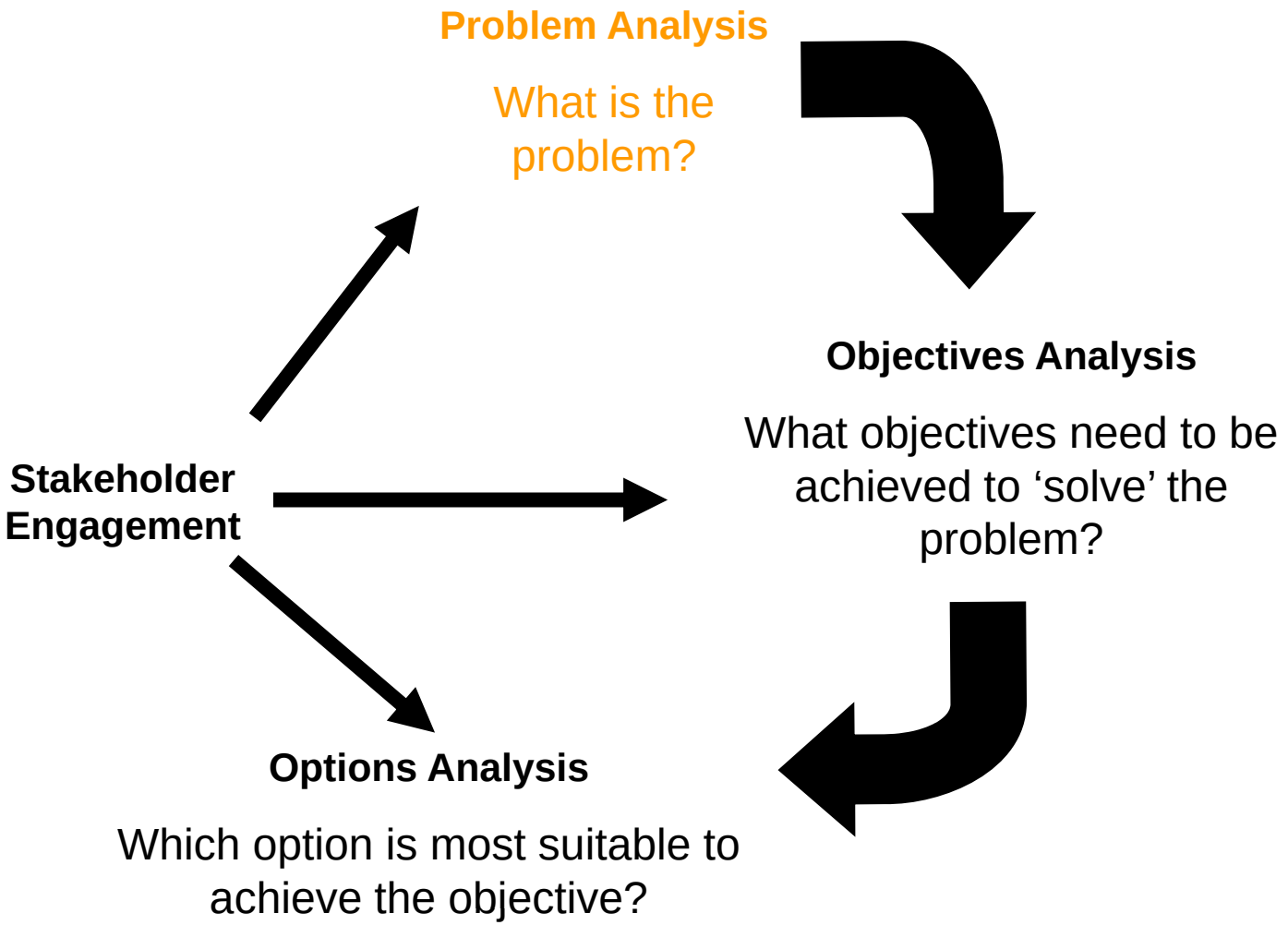
NGO's:

Syrian Environment Association, Damascus Friends Association, Sustainable Development Association, Women Union.

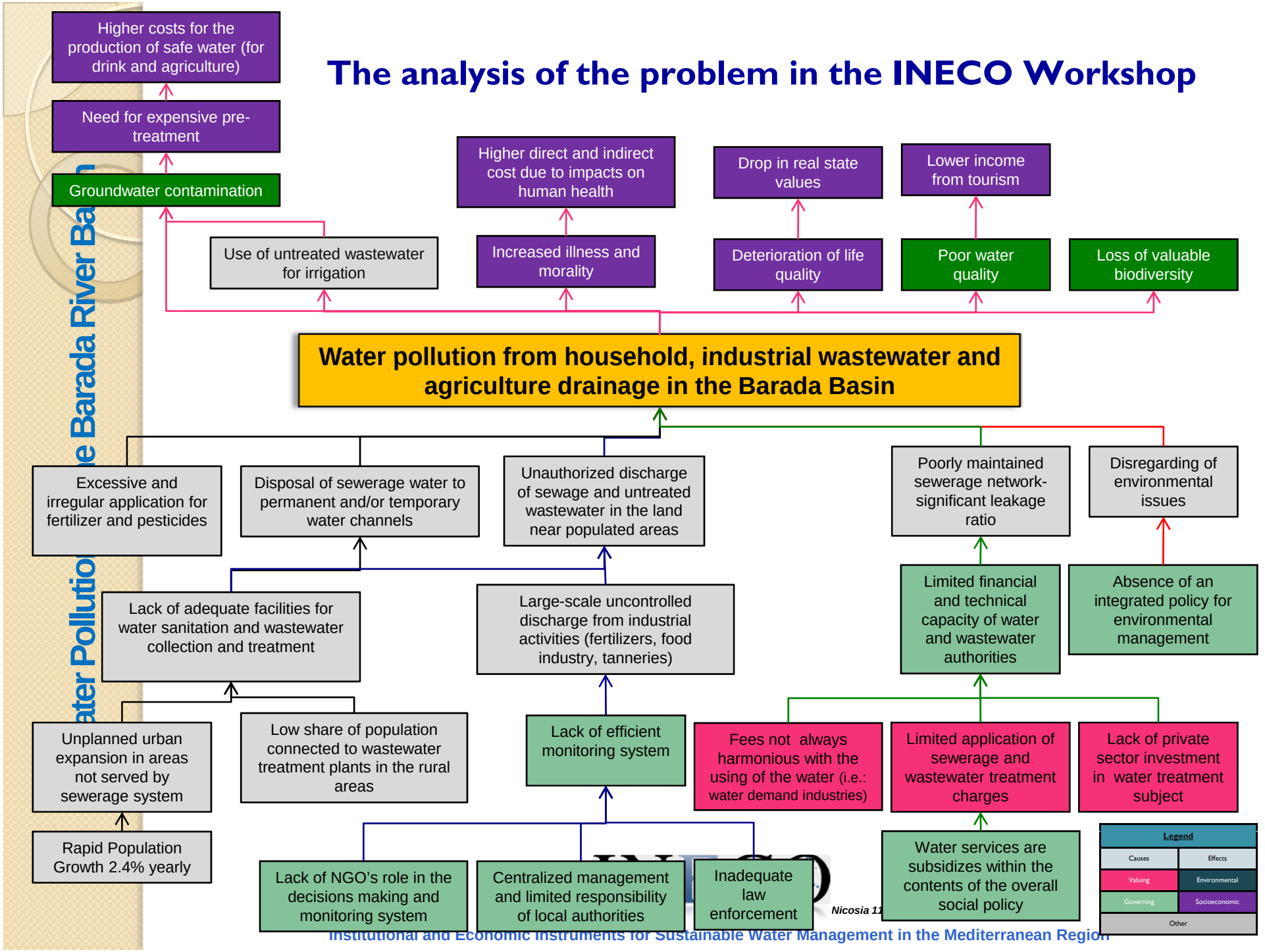
Beneficiaries:

Farmers, Industries, Chambers of Commerce, Industries and Tourism, Mayors of Municipalities.

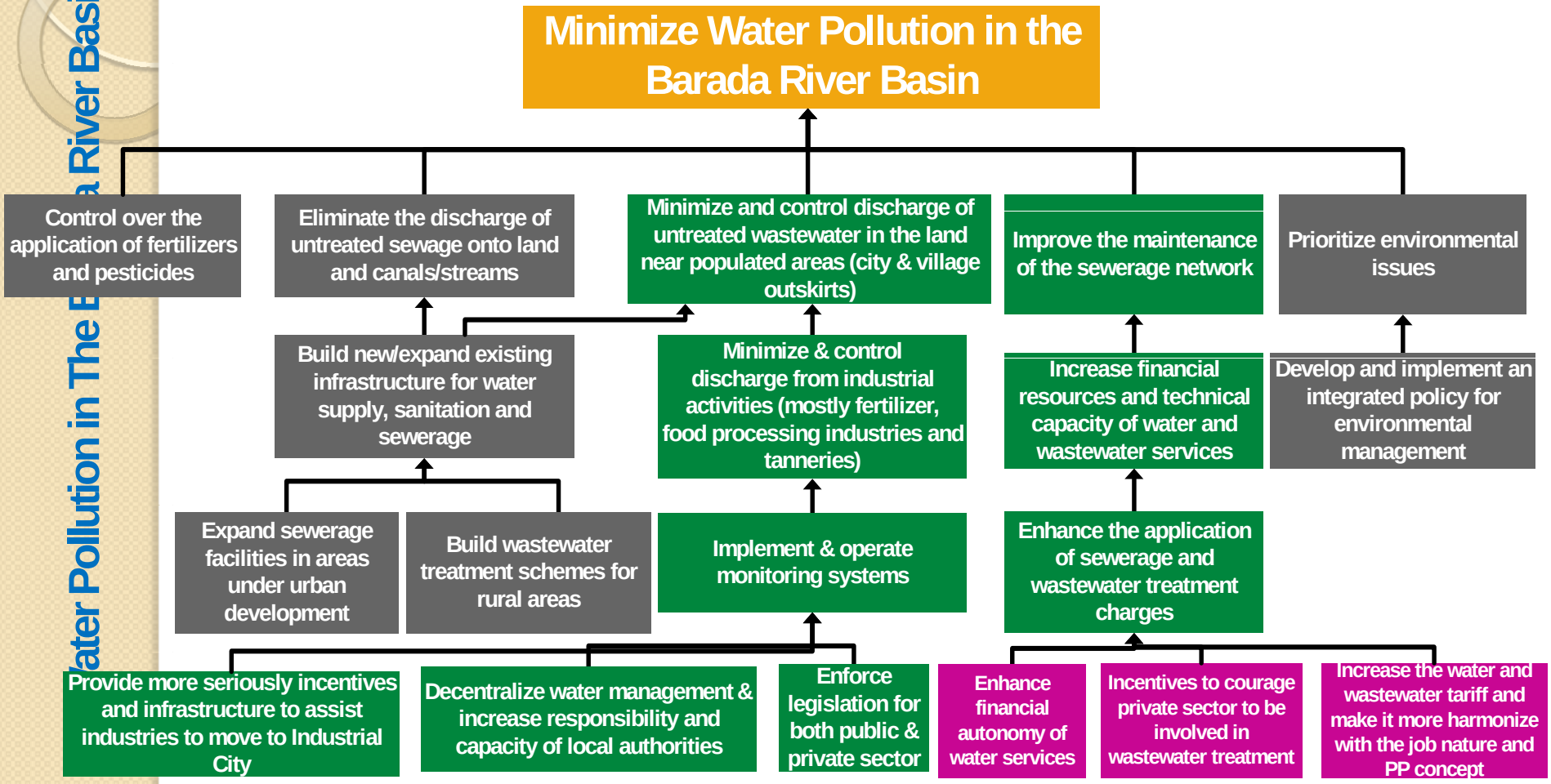
Problem – Objectives – Options Analysis



The analysis of the problem in the INECO Workshop

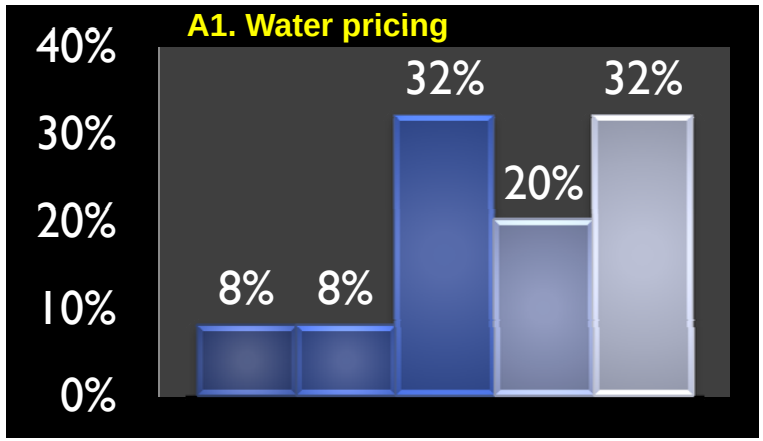


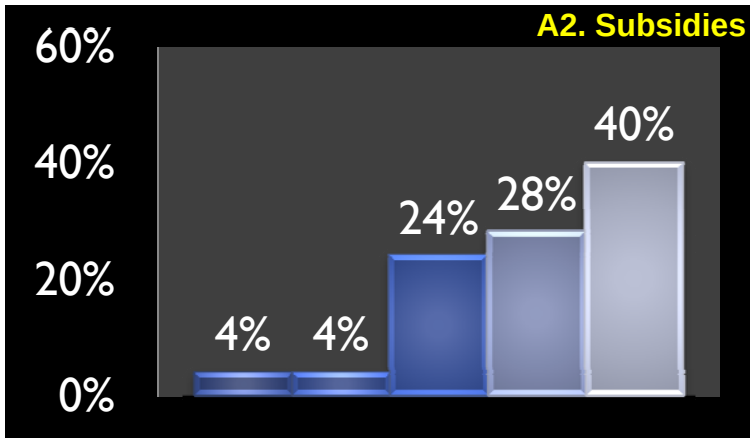
The objectives and suggested options defined in collaboration with local stakeholders

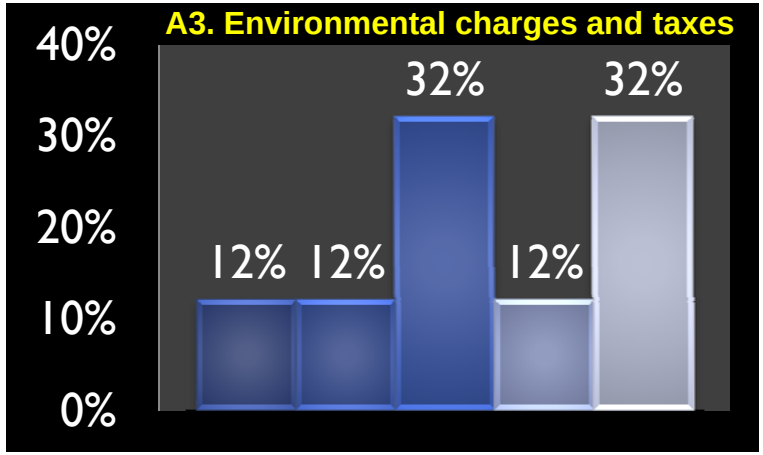


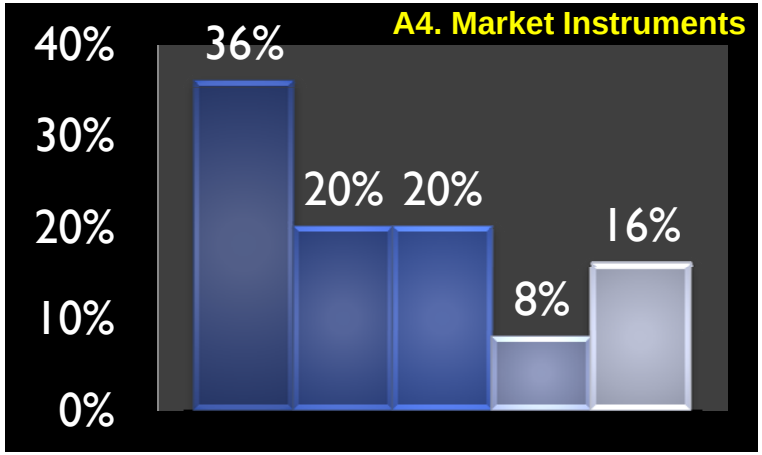
The Evaluation of Options by Stakeholders

and their comments/additional suggestions









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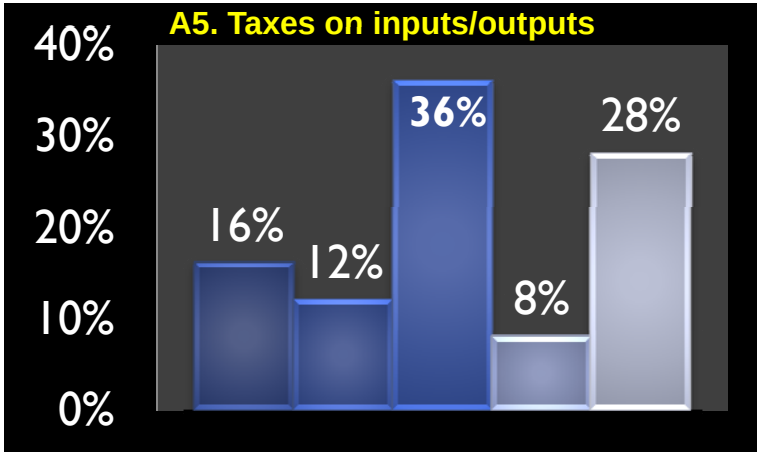

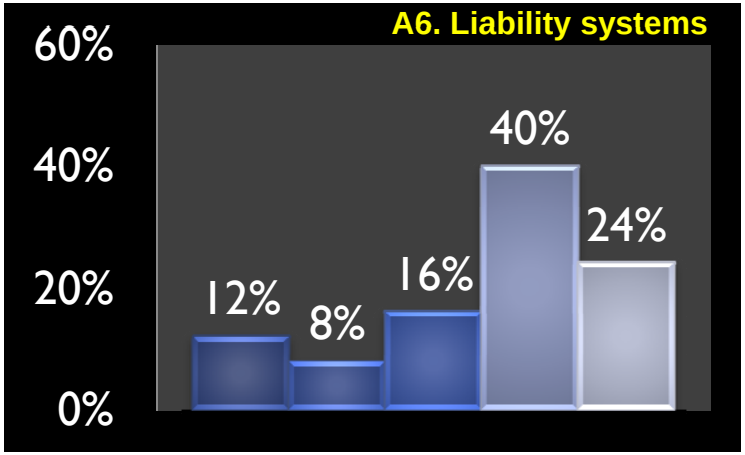

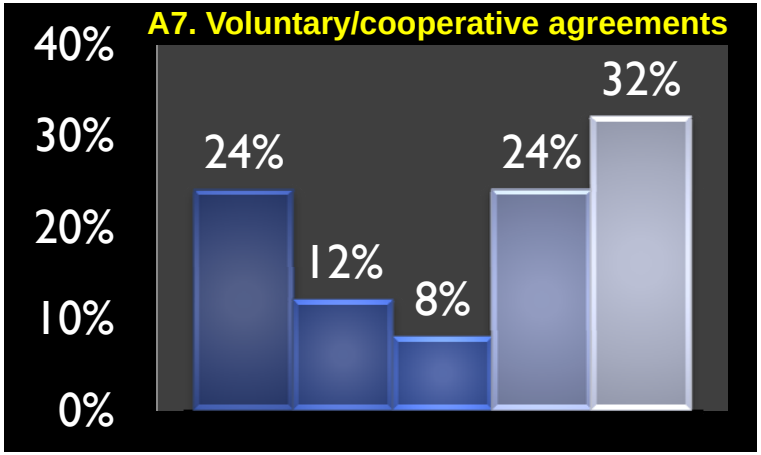

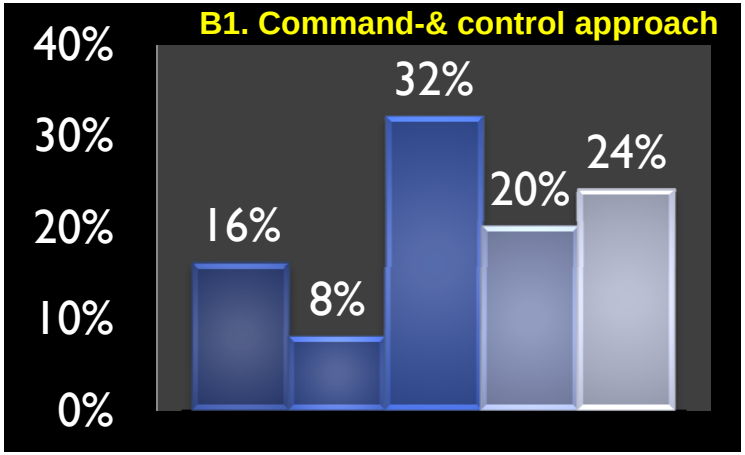

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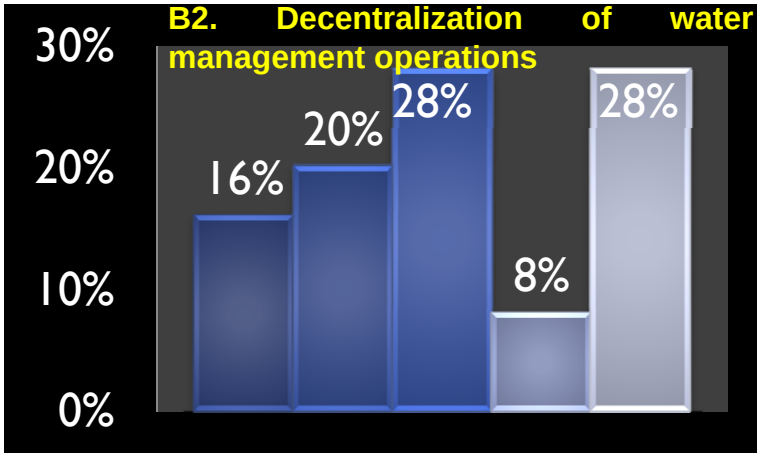

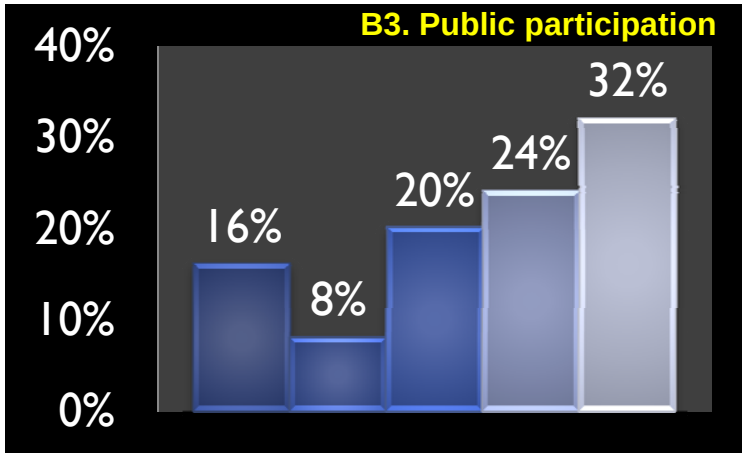

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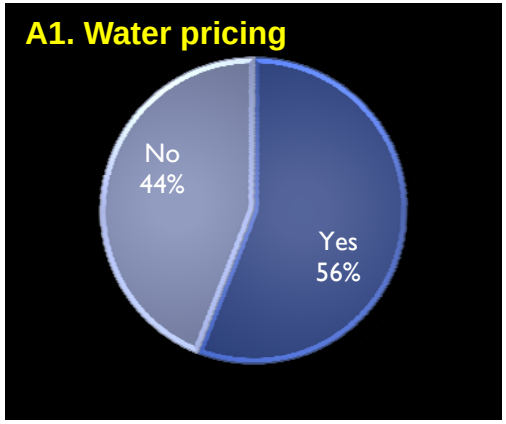

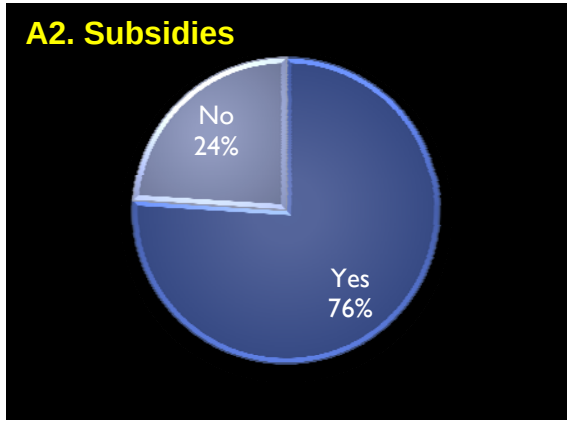

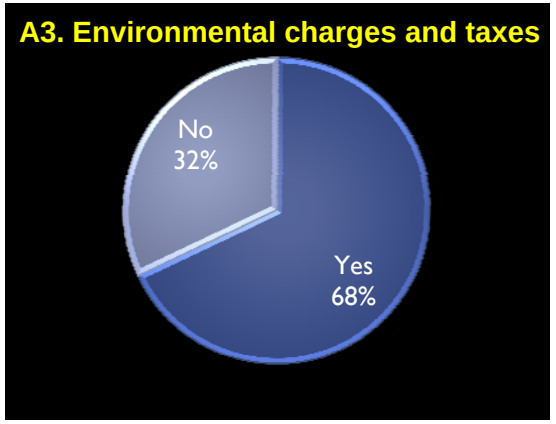

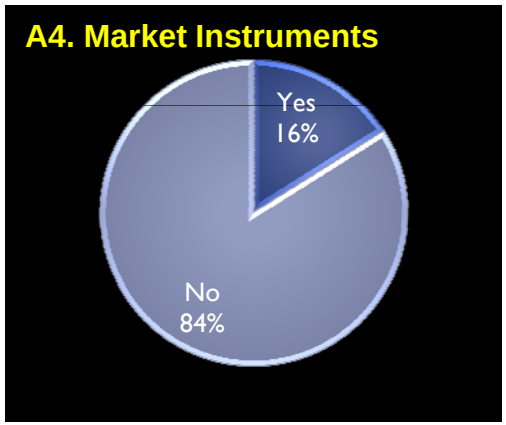

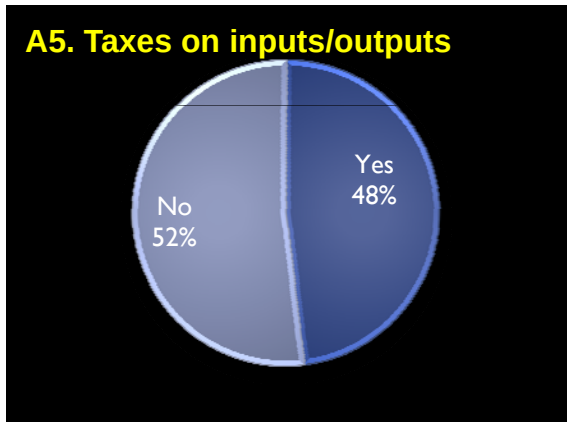

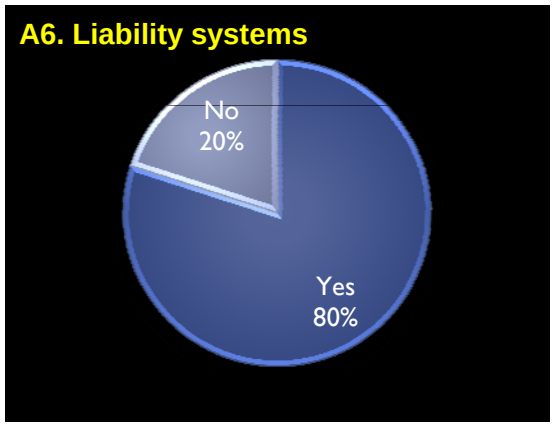

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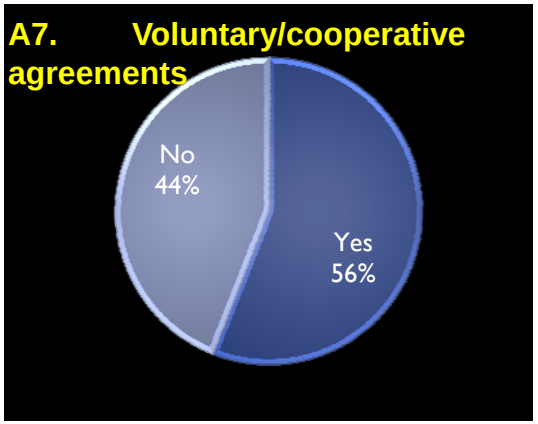
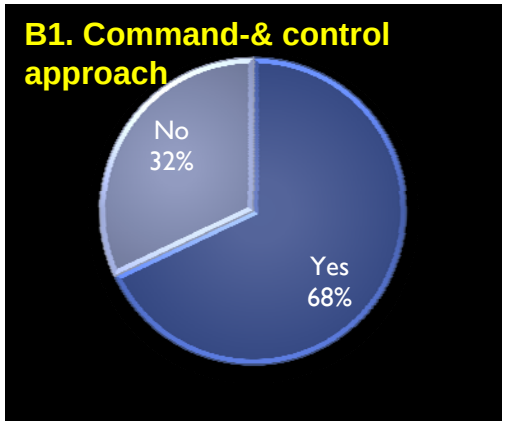
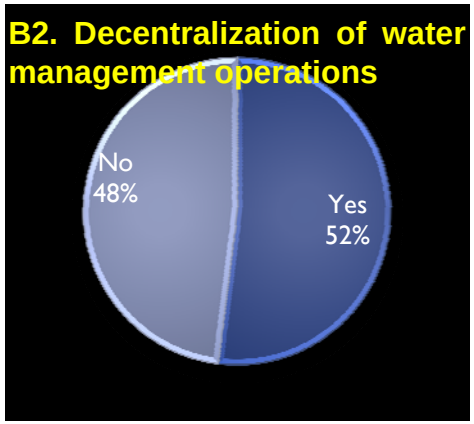
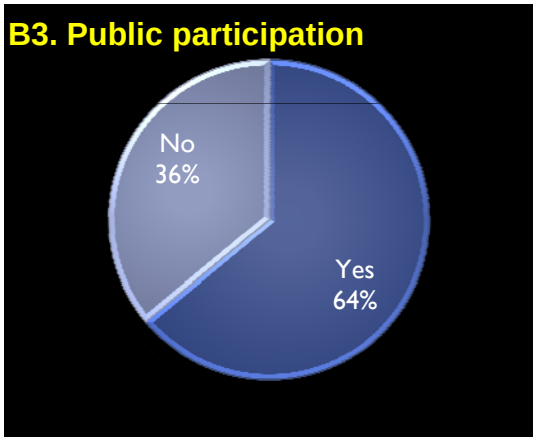




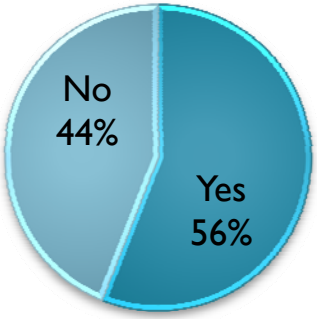




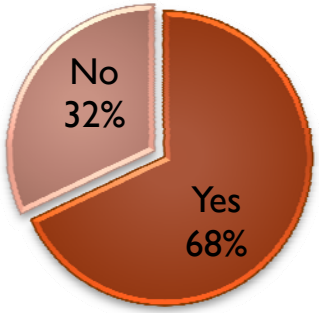
The Evaluation of Options by Stakeholders

and their comments/additional suggestions

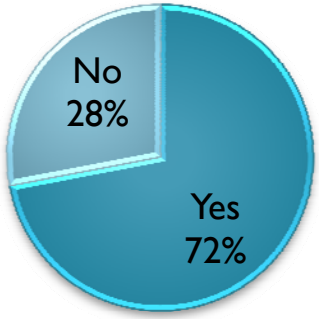
A1. Water pricing



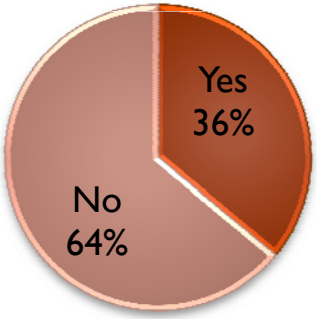
A2. Subsidies



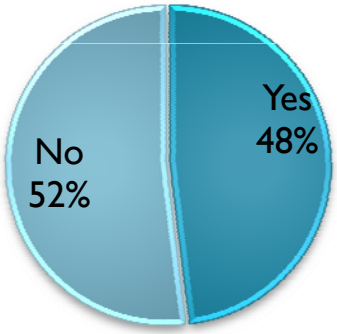
A3. Environmental charges and taxes



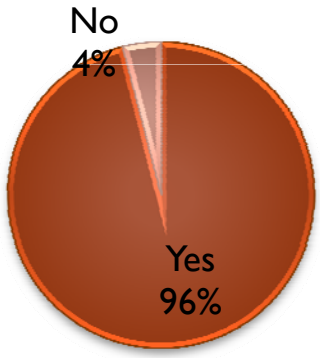
A4. Market Instruments



A5. Taxes on inputs/outputs



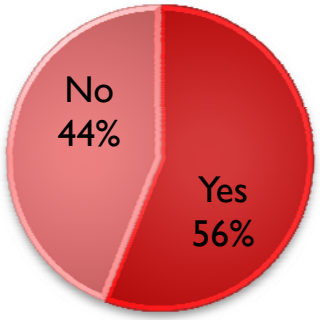
A6. Liability systems



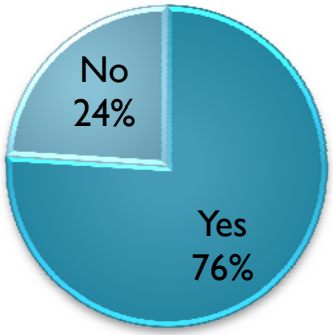
The Evaluation of Options by Stakeholders

and their comments/additional suggestions

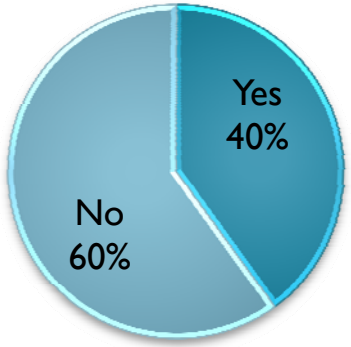
A7. Voluntary/cooperative agreements



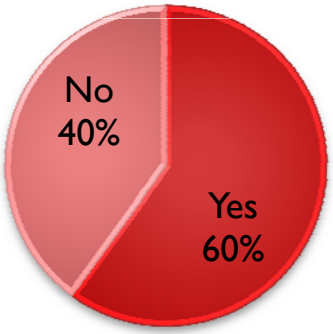
B1. Command-& control approach



B2. Decentralization of water management operations



B3. Public participation



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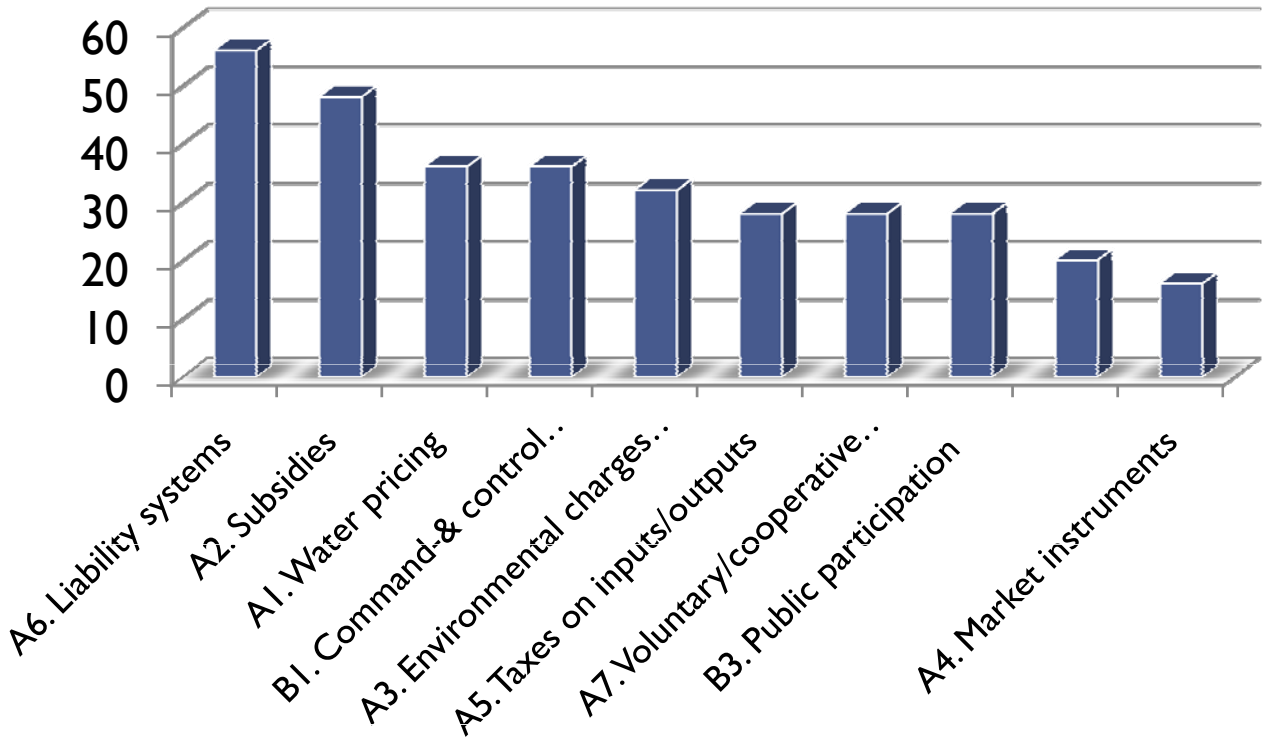
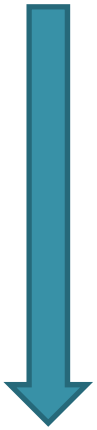


Analysis of the Results

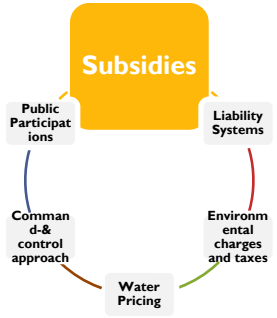
Topic	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3
Instruments more preferable	7	10	6	1	5	3	8	2	4	9
More relevant or feasible for the immediate challenges and opportunities	5	9	8	1	2	10	4	7	3	6
Relevant to water pollution in the Barada River Basin	5	7	8	1	3	10	4	9	2	6
More appropriate for our situation.	8	9	6	1	5	10	4	7	2	3
Options that pertain to the future of Syria	8	10	7	1	2	9	6	5	3	4
Instruments consider as reasonable or applicable	7	8	10	1	3	9	2	6	4	5
Total	**40**	**53**	**45**	**6**	**20**	**51**	**28**	**36**	**18**	**33**



A2. Subsidies.
A6. Liability Systems.
A3. Environmental charges and taxes.
A1. Water Pricing.
B1. Command-& control approach.
B3. Public Participations.
A7. Voluntary / cooperative agreements.
A5. Taxes on inputs/outputs.
B2. Decentralization of water management operations.
A4. Market Instruments.


Subsidies
Liability Systems
Environmental charges and taxes
Water Pricing
Command-& control approach
Public Participations
INECO Policy Proposal

The policy proposal developed by INECO



Subsidies:

Create more incentives to courage industrials to move to Industrial City, and providing them with good price for water, electricity, and wastewater treatment.

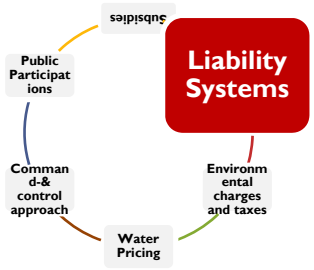
Encourage businesses to invest in water-efficient equipment to help reducing water use and improve water quality.

The government should provide grants and soft loans to industries which are unable to bear the cost of waste water treatment, in addition to award the people who invest for reducing pollution.

Good incentives for the modern irrigation companies,

The need for training, education and technology transfer is essential.

The policy proposal developed by INECO



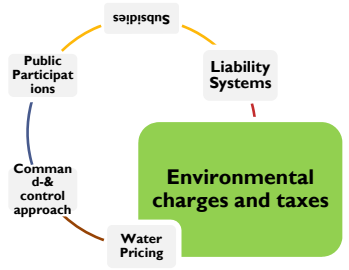
Liability Systems:

Enforcement the law implementation, for both public and private sector.

Legislation to effectively cut back illegal connections and water theft needs to be adopted.

Implementation of tools like the 'polluter pays' principle and cost recovery schemes - possibly in combination with incentives for environmentally-friendly activities

The policy proposal developed by INECO



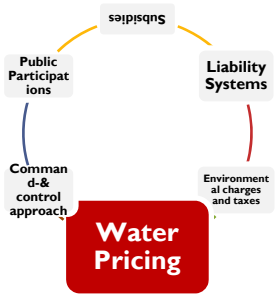
Environmental charges and taxes:

Improving performance standards in water supply and treatment.

Increasing or decreasing the well licensing cost according to situation of groundwater in the area.

Institutional and legal reform providing more liberty to water and wastewater authorities in establishing tariffs.

The policy proposal developed by INECO



Water Pricing:

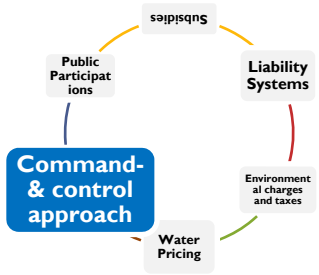
A more effective pricing system should enable water authorities to recover.

Dividing the water bill into segments, according to the purpose of use. The bill should reflect the consumption, maintenance, operating and development cost.

Develop the services in depends on principle "pay more for best services" should be acceptable but not for drinking water quality.

The water prices system should make a good distinction between the agriculture crops and industrial type, method and size.

The policy proposal developed by INECO

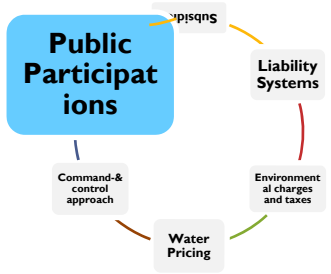


Command-& control approach:

Developing the water database in the basin, and assuring the transparency of information exchange.

Connect users to the collective system in the areas which are ready to achieve that, and find alternative solutions to users who are far away from those systems.

The policy proposal developed by INECO



Public Participations:

Using the participatory approach with water users in order to prepare the water price is important,

Improving the transparency between the decision makers and water users, in order to consider the outputs of public participation processes.

The social awareness campaign is important, and the local media and NGO have an important role in such issue, and that's will push the industry forward to develop their production technique into more environment friendly techniques

The promotion for organic crops must be exist, with awareness campaign to explain to the end users the dangers of using chemical fertilizers and pesticides,

Lessons Learned

Participatory Approach, Emphasis on the role of Water Users Associations, in order to increase the participatory approach in the decision making procedure.

Stakeholder groups need to be formed to discuss the plan, enough time should be given to get their comments and endorsement

The Common Vision: Developing a shared vision is challenging because many values, interests and needs that exist in a river basin.

Building capacities of partners, the know how is essential, technology transfer in this field is very important.

Sustaining coverage by the **media** and public **awareness**

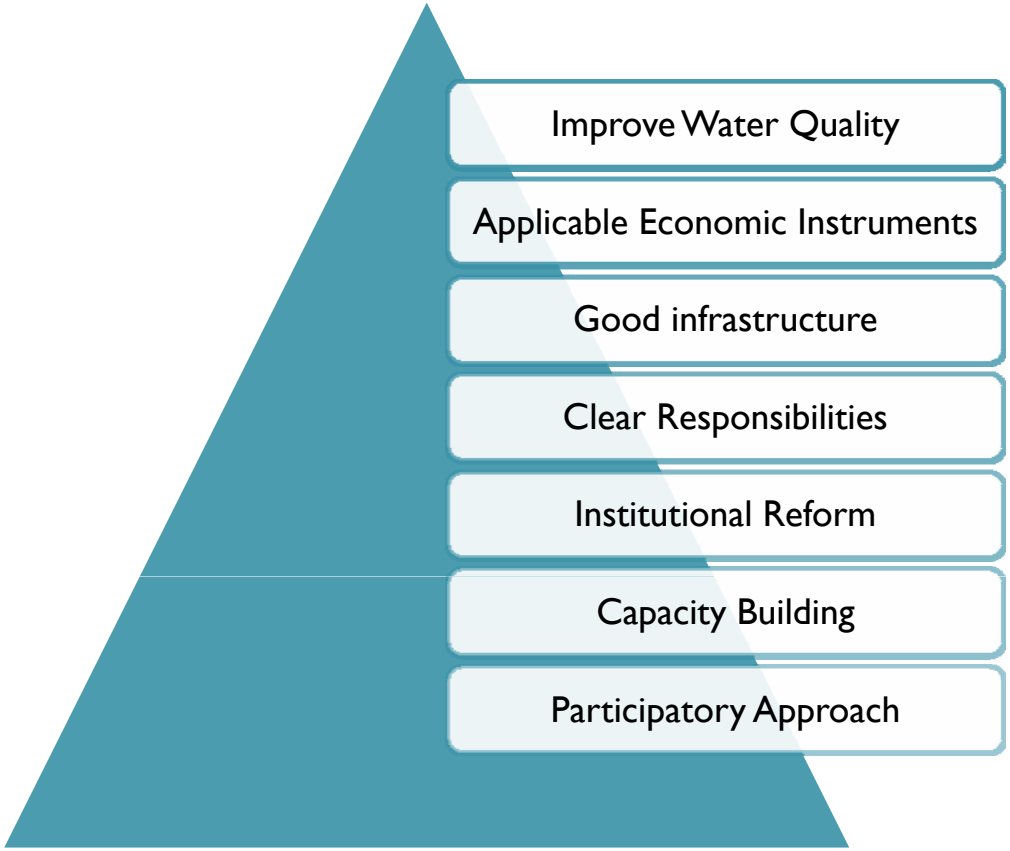
Proposals and approaches need **pilot testing** in a basin where economic, social and environmental stakes are high

Lessons Learned

Establishing river basin agency, Barada Basin Authority, to develop a more effective approach to water supply and facilitate a sustained attack on water pollution.

The authority should prepare water management plans. And impose charges not only for the abstraction of water but also for the disposal of effluents into rivers. The revenue derived from these fees should be used to assist industries and municipalities in constructing new facilities for water supply and water purification.

Lessons Learned



Water Pollution in The Barada River Basin

Thank you

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