



# Water Management in MENA

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## Water issues in MENA

- ▶ Middle East is a water scarce region due to population pressure, economic growth, pollution, drought and climate change.
- ▶ The excessive use of fertilizers, irrigation with sewage water caused public health issues.
- ▶ The system is often struggling with insufficient infrastructure and low water supply and sanitation coverage, particularly in rapidly growing urban slum settlements, with significant consequences, especially regarding public health.



## Water issues in MENA

*Cont.*

- ▶ Understanding the current levels of underground and surface water levels allows to identify supply and demand for renewable fresh water and marginal water.
- ▶
- ▶ Legislation and regulation still have to be strengthened. In many MENA's countries the legal and regulatory framework is still inadequate and there is a need to provide better financial and technical support to water management

# MENA's Water Management

- ▶ Our objectives to address water management and call for investment in technology for small scale water treatment and desalination plants that possible run by solar power. Desalination technology evolve around energy sensitivity, solar power and conversion of garbage into energy.



**Table 2 Innovative technologies and their benefits for IUWM [44]**

	<b>Innovative technology</b>	<b>Benefits for IUWM</b>
1	Natural treatment system	Adds multifunctionality (integrated treatment and environment functions) Improves environmental quality Utilizes natural element, features, and process (soil, vegetation, microorganisms, water courses, etc.) Is robust and flexible/adaptive Minimizes the use of chemicals and energy Promotes water reuse and nutrient recovery
2	Nanotechnology and microbial fuel cells	Provide access to a cheap “green” energy source (enables the capture of electrical energy directly from organic matter present in waste stream)
3	Membrane bioreactors (wastewater)	Enhance new strategy for water management to move toward water reuse Reducing plant footprint Can easily retrofit wastewater treatment processes for enhanced performances Offers operational flexibility (amenable to remote operation) Manages environmental issues (visual amenity, noise, and odor)
4	Membrane technologies (both water and wastewater)	Promote decentralized systems which minimize environmental footprint Enhance contaminant removal and encourage water recycling Minimize the use of chemicals Improve system flexibility and permit small-scale treatment systems
5	Source separation	Promotes water reuse and nutrient recovery Promotes small (decentralized) systems that can be easily managed Avoids the complications and cost of dealing with mixed wastes
6	Anaerobic fermentation (UASB)	Produces biogas Promotes the recovery of energy from wastewater

# Water Management's Investment Opportunities

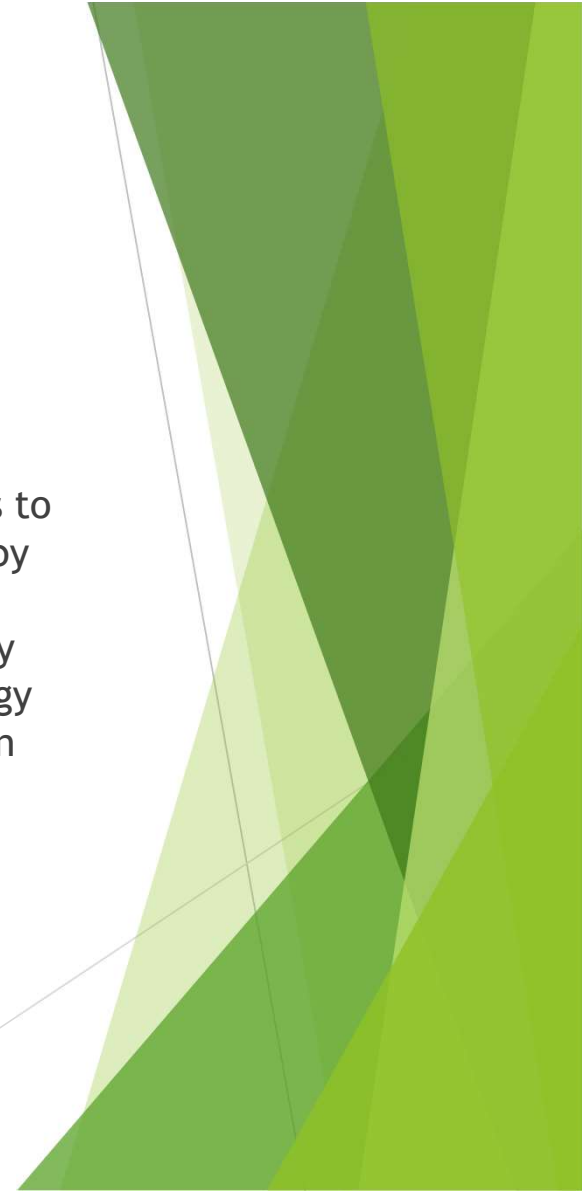
- ▶ a) Modernization of irrigation methods including drip irrigation and uses of treated wastewater;
- ▶ b) Better and more efficient infrastructure to reduce water losses through pipe leakages;
- ▶ c) Reduce water pollution by industrial and urban sectors;
- ▶ d) Small-scale technical capacity building with farmers; rainwater harvesting and village level irrigation infrastructure;
- ▶ h) Dietary shift: switching to the consumption of low water content foods (away from meats toward vegetables). This is particularly relevant in the Gulf states where water is low and but consumption of high water content food like beef/chicken is high.

# Water Management strategies

- ▶ These aims can be advanced through multiple strategies including:
- ▶ (1) sharing of technical data and policy learning from best water management practices,
- ▶ (2) strengthening networks of MENA water experts,
- ▶ (3) building broader and deeper cooperative relationships among MENA experts with water experts in other areas of the world,
- ▶ (4) demonstrating an awareness of cultural contexts and an openness to incorporating values and traditional knowledge to promote efficient and sustainable use of surface and groundwater resources, and
- ▶ (5) identifying and advancing intellectual and technical tools to foster greater transparency in water management, such as stakeholder dialogues and participatory consultations, joint research and field data collection and dissemination, regional scale climate change modeling, and remote sensing data (Rayan and B. Djebedjian,).

# Water Management Partnerships

- ▶ Water management needs national and international efforts to address the water deficit and how efficiently utilize it. There is need for a holistic approach, rather than treating water resources as trans-boundary concerns to any particular basin. Desalination plant might use hydro-power generated by the 400 metre drop from the Red Sea to the lowest point on earth. Development in nano-technology may reduce costs of desalination plants by more than 50%. Low costs desalination plants depend on external technology and financial assistance and donors countries can play a constructive role in fostering regional cooperation.





# Water Management Partnerships

- ▶ The national approach to water management proves to be inefficient and inadequate when basin is shared by different countries. For example, Red-Dead Sea Canal, the World Bank is co-sponsor and coordinator of the feasibility studies. Other donors include Italy, France, Sweden, Japan and South Korea.
- ▶ The idea of Circle of Cooperation (country with shared basin and similar political context) to rethinking water challenges as opportunities. This circle of Cooperation from the basin countries can develop regulatory frameworks and develop common shared interests and exchange technical expertise.
- ▶ The World Bank and GCC should encourage the efforts and provide technical assistant to build integrated water resources management at basin levels.