



**Sustainable Water  
Integrated Management (SWIM) -  
Support Mechanism**



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*Water is too precious to waste*

**WASTEWATER REUSE in the MEDITERRANEAN:  
SWIM-SM Suggested Priorities and Key Activities**

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# Water Scarcity Reached a Critical Situation in the SWIM Countries

Water scarcity is the highest in the World: 7 out of the 9 SWIM countries have sustainable fresh water less than 500 m<sup>3</sup>/capita/year - Year 2010;

Syria and Egypt have sustainable fresh water less than the threshold of 1000 m<sup>3</sup>/capita/year, the limit for water stress;

Water consumption will increase from an estimated 136.1 Bm<sup>3</sup>/year in 2010 to 158 Bm<sup>3</sup>/year in 2020;

Water deficit will rise from 33.8 Bm<sup>3</sup>/year to 49.6 Bm<sup>3</sup>/year in the next ten years;

Groundwater overuse, estimated at 31.5 Bm<sup>3</sup>/year in 2010, will increase to 38.5 Bm<sup>3</sup>/year in 2020.

# And Climate Change will make Scarcity Worst

**According to the IPCC report it is anticipated that over the next century:**

**Rainfall in the MENA region will decrease by 10-25%**

**Runoff will decline by 10-40%**

**Evaporation will increase by 5-20%**

**Most of Impacts are expected after 2025**

Ref: Water in the Arab World: Management Perspectives and Innovations, ed. V.J. Jaganathan, A.S. Mohamed, and A. Kremer, 447-77. Washington, DC: Middle East and North Africa Region, World Bank

# The Water Deficit can be Covered from the Water Demand Management

Four major reforms are required:

1. Water reallocation from agriculture and irrigation to environment, municipal and industrial sectors;
  2. Capping on the utilization of conventional water resources;
  3. Water Pricing;
  4. Water information, awareness and education.
- Such reforms are slow and largely influenced by the political economy

# And/or from the Supply Side of Water Management

## Through:

- **Leak and loss minimization through the rehabilitation of water, wastewater and irrigation networks:** This has been slow and ineffective because of past neglect in the networks' operation and maintenance and the rapid and unplanned urbanization and agricultural expansion;
- **Enhancing the use of non-conventional water resources, namely through recycling of agricultural runoff, treated wastewater reuse (TWWR) and storage and, as a last resort, desalination using renewable energy:** Such potential has not been fully explored by most of the PCs;
- **Other non-conventional water resources which include inter-basin transfer, rainwater harvesting, cloud seeding:** Such systems are faced with political, economical and technological difficulties.

# Use of Treated and Untreated Wastewater in the Partners' Countries

- Egypt, Israel, Jordan, Syria and Tunisia are among the twenty countries in the World with the largest volume of wastewater used for irrigation (treated and untreated);
- Algeria, Morocco and Tunisia are undertaking artificial recharge of the over exploited aquifers with surface and rain water and to a lesser extent with treated wastewater.

Ref: Scheierling SM, Bartone C, Mara D, and Dreschel P, "Improving Waste Water Use in Agriculture, an Emerging Priority" , Policy Research Working Paper # 5412, The World Bank, September 2010.

# Constraints to Wastewater Reuse

**Policy:** Wastewater reuse is usually not part of national water policies addressing water scarcity in most of the PCs and is not reflected in the national water balance sheet;

**Institutional:** There is a multiplicity of ministries and agencies (irrigation and agriculture, energy, environment, interior and municipal affairs, health) involved in treated wastewater reuse, with conflicting objectives and overlapping responsibilities. Stakeholders involvement is largely absent;

**Legal:** There is lack of an appropriate legal framework to institutionalize the use of treated wastewater in a comprehensive manner. Some PCs have a regulatory framework and guidelines for treated wastewater reuse, such as Jordan and Tunisia.

# Constraints to Wastewater Reuse (ctd.)

**Technical:** New technologies related to wastewater treatment are not well understood in terms of adaptation to local conditions, sustainability and affordability;

**Social:** The social dimension for acceptability by, and consultation with users has been neglected leading to lack of trust, social tension and non-acceptance;

**Environmental:** The environmental and health impacts and associated risks have not been carefully studied, monitored and mitigated;

**Economical:** Treated wastewater pricing does not reflect true economical values and opportunity costs. Wastewater treatment and reuse are subsidized.



# A New Paradigm Proposed by SWIM: A Regional Non-conventional Water Resources (NCWR) Initiative

Treated wastewater is an Asset:

- To be managed as part of the country's integrated water resources management framework;
- To increase the water availability for specific purposes that are hygienically safe, ecologically sustainable and beneficial for the society as a whole;
- To contribute to adaptation to climate change and mitigation of its impacts through the reuse and recycling of treated waste water.

# Elements of the Initiative

- Development of elements of national policies/strategies or actions plans for the planning, production, management and monitoring of the use nonconventional water resources within the IWRM framework;
- Planning procedures and regulations, pricing structures, technology applications, and institutional capacity to promote the use of non-conventional water resources;
- Promoting stakeholders' awareness and social acceptance on the use of non- conventional water resources also by strengthening the creation of a related water culture;
- Information, capacity building and dissemination of best practices.

# Benefits from the Initiative

- Providing the necessary strategic and technical tools for the decision makers to make informed decisions on the use of treated wastewater based on economic, environmental and social justification;
- Influencing policies in favor of reducing freshwater withdrawals based on regulated water allocations and demands;
- Providing the necessary rules and regulations for the protection of both surface and groundwater resources and reduce health exposure and hazards;
- Establishing institutional & consultation mechanisms for the management of these resources in a transparent, accountable manner;
- Sharpening the skills and expertise of water and environment related institutions on the technical and economics of the re-use of treated waste water;
- Providing state of the art knowledge to specific target groups (e.g the farmers) and the public on the risks and benefits of treated wastewater resources.

# Objectives of the Initiative

- To enhance the policy, institutional and legal framework for the management of non-conventional water resources, within the IWRM context and;
- To strengthen the institutional capacity and public participation for the planning and management of these resources.

# Five Proposed Tasks to Achieve the Objectives of the Initiative

- 1- Strategy Formulation;
- 2- Improving the legal framework;
- 3- Developing the institutional framework for non-conventional water resources;
- 4- Enhancing the environmental and social protection for the non-conventional water resources;
- 5- Implementing communication, awareness raising and capacity building activities.

# Task 1

## Strategy Formulation

### Objective

To assist selected PCs in developing the strategic elements and/or the action plan for the use of non- conventional resources as part of the water balance of the country

### Proposed Sub-Tasks

- Summarizing existing policies on wastewater re-use;
- Assessment of Best Available Technologies;
- Policy Options for the use of NCWR based on cost benefit analysis;
- Prioritizing & sequencing interventions;
- Formulating the elements of the strategy/action plans.

# Task 2

## Improving the legal Framework

### Objective

To propose changes and modifications in the regulatory framework in order to anchor the use of treated wastewater resources in the national water and environmental laws and regulations.

### Proposed Sub-Tasks

- An assessment of the legal and regulatory framework for waste water re-use;
- Use of EC directives as basis of modifying / developing the relevant national legal framework;
- Review and/or development of standards based on WHO guidelines of 2006 and EC directives;
- Development of monitoring and enforcement manual.

# Task 3

## Developing the Institutional Framework

### Objective

To develop an institutional mechanism for managing treated wastewater including its use in artificial recharge with stakeholders' participation.

### Proposed sub-tasks

- An assessment of the organization and management of implementing agencies involved in wastewater reuse;
- Clarification of the roles and responsibilities at the national and local levels for the supply and management of treated wastewater & artificial recharge;
- Development of consultative mechanisms giving all interested parties an opportunity to participate;
- Development of financing models for private sector participation or private-public partnerships in the financing and/or management of wastewater treatment plants and wastewater reuse.



# Task 4

## Enhancing Environment and Social Protection

### Objective

To develop the necessary tools and guidelines for mitigating the adverse environmental and social effects of treated and untreated wastewater resources.

### Proposed Sub-Tasks

- Preparation of sector guidelines and TORs for EIAs of wastewater re-use and sludge treatment;
- Preparation of TOR and guidelines for social assessment related to TWWR;
- Development of an environmental monitoring and enforcement manual on wastewater reuse and sludge disposal.

# Task 5

## Implementing communication, awareness raising & capacity building activities

### Objective

To strengthen the capacity in the management of treated waste water re-use and increase the awareness of the stakeholders in order to promote social acceptance

### Proposed Sub-Tasks

- Trainings on: Technologies assessment, Cost benefit analysis of Investments, EIA, Social Assessment, Health risk assessment, WHO guidelines of 2006;
- Publications, e.g brochures for farmers on the impacts on health and the environment of re-use of raw or treated wastewater in agriculture (incl. best practices from other regions and countries);
- Information workshops and consultations with relevant Stakeholders.

# Proposed Output

- A technology assessment and techno-economic options for the use of non-conventional water resources;
- Best-practices policy note on developing strategies, tariff for cost recovery and regulations for wastewater reuse;
- Proposed modifications for incorporating the legal elements and regulations pertaining to wastewater reuse;
- A procedural manual on the role and responsibilities at the national and local levels for the supply and management of treated waste water and artificial recharge;
- A report on the role of private sector participation or private-public partnership in the financing and/or management of wastewater treatment plants and wastewater reuse as well in desalination using renewable energy;
- Terms of reference and sector guidelines for environment, social and health risk assessments;
- Information and awareness raising brochures, manuals, etc.

# Key Questions for Discussion

- Do SWIM-SM priorities on the subject respond to the needs and priorities of the Partners Countries?
- What additional activities should be considered by SWIM-SM?
- With which initiatives and programs should SWIM-SM synergize?

Thank you very much for  
your attention

*For additional information please  
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