Horizon 2020
CAPACITY BUILDING/MEDITERRANEAN ENVIRONMENT PROGRAMME

Sustainable Water Integrated Management (SWIM) - Support Mechanism

"Innovative and adaptable technologies for treated waste water re-use, including the re-charge of aquifers and desalination"

Sub-regional training: 10-13 April 2012, Tunis, Tunisia

The Horizon 2020 Initiative

The "**Horizon 2020 Initiative"** aims to de-pollute the Mediterranean by the year 2020 by tackling the sources of pollution that account for around 80% of the overall pollution of the Mediterranean Sea: municipal waste, urban wastewater and industrial pollution.

Horizon 2020 was endorsed during the Environment Ministerial Conference held in Cairo in November 2006 and is one of the key initiatives run under the Union for the Mediterranean (UfM). The H2020 2007-2013 Road-Map focuses on the following four pillars:

- Identification of projects to reduce the most significant sources of pollution.
- Identification of capacity-building measures to help neighbouring countries creates national environmental administrations that are able to develop and police environmental laws.
- Use of the EC's research budget to develop greater knowledge of environmental issues relevant to the Mediterranean and ensure this is shared.
- Develop indicators to monitor the success of Horizon 2020.

H2020 is made up of the following components: monitoring, reporting and research (RMR); investment; and capacity building. Under each component, a project is currently being run. H2020 Capacity Building/Mediterranean Environment Programme (H2020 CB/MEP) is the project aiming at enhancing the capacities to address pollution problems at institutional and society level. In addition, through the H2020 MEP, a Hot Spot Investment Programme (HSIP) for the West Balkans and Turkey - as complementary to the Mediterranean HSIP (MeHSIP) – has been elaborated. The other two projects currently being carried out under the investment and RMR H2020 components are respectively the MeHSIP and the ENPI Shared Environmental Information System (ENPI SEIS).

The framework - Horizon 2020 Capacity Building/Mediterranean Environment Programme

Obviously pollution is expected to be substantially reduced through the installation and proper functioning of major infrastructures (e.g. sewage treatment plants), installing pollution reduction technologies in industries, etc. However, this won't work if institutional and individual capacities are not in place. This is what the H2020 CB/MEP aims to enhance by operating within the existing and developing policy instruments, and supporting the implementation of the commitments undertaken in the framework of the ENP as well as other regional agreements e.g. the Barcelona Convention, while cooperating, coordinating and synergising with all relevant (EU and other) programmes.

Aims and objectives

The main objective of this project is to support the implementation of Horizon 2020 with a special focus on environmental mainstreaming. It aims to address the following problems:

- low political priority given to the environment;
- insufficient integration of environment in the different sector policies (agriculture, tourism, transport or energy) and lack of inclusion of the different actors from local to international level;
- Insufficient capacities and resources at institutional and civil society level.

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More specifically, the purpose is to support the implementation of the Horizon 2020 Initiative Road Map and Work Plan through capacity building and awareness raising activities, and to promote integration of environment issues in other sectors policies.

Partners

This project is funded by the European Union and implemented by the National and Kapodistrian University of Athens (NKUA) in consortium with: Mediterranean Action Plan of the United Nations Environment Programme and its Regional Activity Centres and Programmes (UNEP/MAP and its RACs), National Waste Management Agency (ANGed)/ Regional Solid Waste Exchange of Information and Expertise Network in Mashreq and Maghreb Countries (SWEEPNet), Umweltbundesamt GmbH – Austrian Environment Agency (AEA), Lebanese Ministry of Energy and Water - the General Directorate of Hydraulic and Electrical Resources (LMoEW), Hellenic Ministry for Environment, Energy and Climate Change, UNESCO-IHE Institute for Water Education (UNESCO-IHE), Mediterranean Information Office for Environment, Culture and Sustainable Development (MIO-ECSDE), Arab Network for Environment and Development (RAED), WWF Mediterranean Programme Office (WWF MedPOL), Association of Cities and Regions for Recycling and Sustainable Resource Management (ACR+), Arab Countries Water Utilities Association (ACWUA).

Partner Countries

The Partner countries are: Albania, Algeria, Bosnia- Herzegovina, Croatia, Egypt, Israel, Jordan, Lebanon, Montenegro, Morocco, occupied Palestinian territory, Tunisia, Turkey, Syria.

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

SWIM is a Regional Technical Support Program that includes 9 South Mediterranean Countries. The Program is funded by the European Neighborhood and Partnership Instrument (ENPI) South/Environment. The project, among other objectives, complements and adds value to the Horizon 2020 Initiative to de-pollute the Mediterranean Sea by addressing in particular water issues, in synergy with three relevant EC funded Programs, namely the Mediterranean Hot Spots Investment Program - Project Preparation and Implementation Facility (MeHSIP-PPIF), the Capacity Building/Mediterranean Environment Program (CB/MEP) and the ENPI Shared Environmental Information System (ENPI/SEIS).

Its overarching objective is to promote actively the extensive dissemination of sustainable water management policies and practices in the region given the context of increasing water scarcity, combined pressure on water resources from a wide range of users and desertification processes, in connection with climate change.

The specific objectives of the SWIM-SM are to: (1) Raise the awareness of decision-makers and stakeholders in the Partner Countries on existing and upcoming threats on water resources, on the necessity to switch to more viable water consumption models as well as on possible solutions to face the challenges; (2) to support the Partner Countries in designing and implementing sustainable water management policies at the national and local levels, in liaison with on-going relevant international initiatives; and (3) Contribute to institutional strengthening, to the development of the necessary planning and management skills and to the transfer of know-how.

Course Description - "Innovative and adaptable technologies for treated waste water re-use, including the re-charge of aquifers and desalination"

Introduction to the training course

This sub-regional training course is organized within the framework of the ENPI Horizon 2020 CB/MEP and Sustainable Integrated Water Management - Support Mechanism (SWIM-SM) projects. It is organized by UNESCO-IHE Institute for Water Education and the Arab Countries Water Utilities Association (ACWUA). Its duration is 4 days and the language of the training course will be English and French. Up to around 40 participants are expected to attend from relevant bodies of **Algeria, Egypt, Lebanon, Morocco** and **Tunisia**.

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Target group

The capacity building activity is of an intermediate/advanced level and is targeted to:

- Mid-career practitioners, managers and decision-makers from water authorities, water and wastewater utilities, environmental agencies, environmental health departments, and other competent relevant bodies.
- Junior university staff in fields related to desalination and waste water treatment.

Learning objective

- To introduce participants to the state-of-the-art of wastewater reuse schemes, including innovative and adaptable treatment technologies. Risk management and effluent standards for various reuse purposes are discussed to support scheme design and technology selection.
- To introduce participants to technologies for artificial recharge with treated wastewater, and their role in wastewater reuse schemes.
- To understand the state of the art in desalination processes and their economic, energy and environmental impacts.

Methodology and Structure

The general structure of the course will be:

- Lectures followed by plenary discussions
- Case studies and best practices
- A group exercise
- Presentations by participants
- Site visit

Resources for participants

Resources that are intended to be provided to participants are:

- Powerpoint presentations
- Lecture notes
- Reference materials

Learning outcomes of the training course

On completion of this training course, the participants will be able to:

- Critically reflect on the design of wastewater treatment and reuse schemes, in terms of risk management and required effluent quality for various reuse purposes, and in terms of technology choice.
- To evaluate the application of Soil Aquifer Treatment (SAT) for aquifer recharge, to prepare simple SAT designs and formulate the required operational activities for sustainable operation.
- Ascertain and consider options for sustainable use of desalination.

The course will allow sufficient time for clarifications/questions/discussions of emerging topics.

A preliminary overview of the course is given below:

The planned modules are the following:

- Introduction to the global status of wastewater reuse
- EU legislation and EU funded projects on wastewater treatment and reuse
- Reclaimed water quality requirements
- Water treatment options
- Agricultural reuse of wastewater
- Soil Aquifer Treatment (SAT) for wastewater treatment and reuse
- Design and Operational Aspects of SAT

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- Water hierarchy and state of the art of desalination
- Desalination
- SWIM Assessment of Best Available Technologies (BAT) for Wastewater Reuse and Desalination in Rural/Local Areas

Innovative and adaptable technologies for treated waste water re-use, including the re-charge of aquifers and desalination

Course schedule/ curriculum

Date: 10-13 April 2012

Course schedule/ curriculum				
10.04.2012	***Topic***	***Description***	***Length***	***Method/Speaker or Trainer***
Session 1	Official opening	Welcome addresses and opening words Introduction to Horizon 2020 and the course program	45 min (09:00 - 09:45)	Stefano Corrado, EU Delegation - Tunisia Dr. Emad Adly, H2020 CB/MEP Charbel Rizk, SWIM-SM Peter van der Steen, UNESCO IHE
Session 2	Introduction: (global) status wastewater reuse	Description of the state-of-the-art of wastewater treatment and reuse	30 min (09:45 - 10:15)	Peter van der Steen
Session 3	EU water projects	Overview of EU legislation and EU funded projects on wastewater treatment and reuse	30 min (10:15 - 10:45)	Koussai Quteishat
			Coffee (15 min)	
Session 4	Reclaimed water quality requirements	Reclaimed water quality requirements, based on environmental risk assessment and management	30 min (11:00 - 11:30)	Peter van der Steen
Session 5	Presentations by participants	Introduction of participants: expertise, experience, background, local conditions	1 hour (11:30-12:30)	Participants presentations
			Lunch (1 h)	
Session 6	Water treatment options	Treatment options: treatment matrix, standard treatment schemes	1.5 h (13:30-15:00)	Peter van der Steen
			Coffee (15 min)	
Session 7	SWIM Assessment	Assessment of Best Available Technologies (BAT) for Wastewater Reuse in Rural/Local Areas	1 hour (15:15-16.15)	Charbel Rizk, SWIM-SM
Session 8	Water treatment options	Treatment options: innovative and adaptable technologies	30 minutes (16:15-16:45)	Peter van der Steen
11.04.2011	***Topic***	***Description***	***Length***	***Method/Speaker or Trainer***
Session 1	Agricultural reuse of wastewater	Agricultural use of treated wastewater and WHO guidelines	30 minutes (09.00-9:30)	Peter van der Steen
Session 2	Soil Aquifer Treatment	Introduction to Artificial Recharge with Treated Wastewater	1 hour 15 min (9:30-10:45)	Saroj Sharma
			Coffee (15 min)	
Session 3	Soil Aquifer Treatment	SAT for Wastewater Treatment and Reuse (1)	45 minutes (11.00 - 11.45)	Saroj Sharma
Session 4	Soil Aquifer Treatment	SAT for Wastewater Treatment and Reuse (2) - Examples/Case studies	45 minutes (11:45-12:30)	Saroj Sharma
			Lunch (1 h)	
Session 5	Soil Aquifer Treatment	Design and Operational Aspects of SAT (1)	45 min (13:30-14.15)	Saroj Sharma
Session 4	Soil Aquifer Treatment	Design and Operational Aspects of SAT (2)	45 min (14:15 - 15:00)	Saroj Sharma
			Coffee (15 min)	
Session 7	Soil Aquifer	Design and Operational Aspects of SAT (3) -	45 min	Saroj Sharma

	Treatment	Calculations	(15:15-16:00)	
Session 8	Exercise		1 h (16:00-17:00)	Participants exercise led by Peter van der Steen
12.04.2011	***Topic***	***Description***	***Length***	***Method/Speaker or Trainer***
Session 1	Desalination	Water hierarchy and state of the art of desalination	30 minutes (09:00-9:30)	Koussai Quteishat
Session 2	Desalination Externalities	Energy, environment and cost as related to desalination and IWRM	1 hour 15 min (9:30-10:45)	Koussai Quteishat
			Coffee (15 min)	
Session 3	Sustainable Desalination	Desalination as a sustainable source	45 minutes (11.00 - 11.45)	Koussai Quteishat
Session 4	SWIM Assessment	Assessment of Best Available Technologies (BAT) for Desalination in Rural/Local Areas	45 minutes (11:45-12:30)	Charbel Rizk, SWIM-SM
			Lunch (1 h)	
Session 5	Desalination Options	Interactive discussion with participants on desalination as an option	45 min (13:30-14.15)	Koussai Quteishat and SWIM-SM
Session 4		Presentations by participants	45 min (14:15 - 15:15)	Led by Koussai Quteishat, Saroj Sharma and Charbel Rizk
			Coffee (15 min)	
Session 7		Evaluation	45 min (15:15-16:00)	Koussai Quteishat
Session 8		Certificates and closure	1 h (16:00-17:00)	Dr. E. Adly, Koussai Quteishat, Saroj Sharma and Charbel Rizk
13.04.2011	***Site Visit***			
	08:00 : Departure 09:30 - 11:00 : Visit of the artificial wetland of Jouggar 11:30 - 12:00 : Visit of the archaeological-Roman site : "Temple des Eaux" at Zaghouan *(water spring and the aqueduct conveying drinking water from Zaghouan to Carthage)* *13:00 - 14:00 Lunch* 14:15 - 16:00 Visit of the pumping station and the irrigated perimeter of treated water in Soukra 16:15 - 17:15 Visit of an urban agriculture project using harvested rainwater and treated grey water 17:40 : Return to Tunis			