

## Horizon 2020 Capacity Building/Mediterranean Environment Programme

### “Wastewater treatment and reuse”

6-8 March, Jordan, 2011

#### Introduction - 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 create 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) – is being elaborated. The other two projects currently being carried out under the investment and RMR H2020 components are respectively the MeHSIP and the Mediterranean Shared Environmental Information System (Med 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. of 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.

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 MedPO), 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.

## Course Description - Wastewater treatment and reuse

### Introduction to the training course

The training course is organized within the framework of the Horizon 2020 CB/MEP project and in response to the capacity building needs identified earlier in the project. The course is organized by the UNESCO-IHE Institute for Water Education with the support of the Arab Countries Water Utilities Association (ACWUA).

Its duration is 3 days; the language of the course is English.

Twenty-five (25) to thirty (30) participants will attend from Jordan.

### Target group

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

- Mid-career wastewater managers and decision-makers from municipalities, water and sewerage associations, water authorities
- University staff in fields related to waste water treatment

### Learning objectives

The main objectives of the course are:

To promote integral thinking: e.g. interaction between drinking water consumption and waste water production; to introduce wastewater reuse through integrated water resources management; to spread knowledge on technologies and technology selection.

### Methodology and Structure

The workshop is intended to be mostly in the form of lectures. The general structure of the course will be:

- Lectures
- Group- and plenary discussions
- Learning by doing exercises
- Video display
- Case study exercises
- Participant presentations

- Field-trip possibility

### Resources for participants

Resources that are intended to be provided to participants are:

- PPTs, reference documents
- Case study material
- WAWTTAR manual
- WAWTTAR calculation model

### Learning outcomes of the training course

The key learning outcomes are:

1. To understand the global and local status of water supply and sanitation within the context of coastal zones
2. To implement the concept of objective oriented planning as a tool for better wastewater management in the coastal zones
3. To differentiate between conventional and alternative water management technologies and approaches, including water demand management, sewerage, wastewater treatment, sludge treatment etc.
4. To understand the concepts of reuse and cost-recovery in wastewater management in coastal zones
5. To apply technology selection methodologies and software
6. To exchange experiences in wastewater management in the Mediterranean

### Preliminary course schedule/curriculum

The following possible subsequent modules will be addressed:

- Introduction: (global) status of sanitation
- Pollution of the marine environment
- Presentations by participants (to introduce themselves and describe local conditions)
- Problem analysis: introduction + exercise on local case
- Objectives analysis: introduction + exercise on local case
- Conventional wastewater treatment technologies (Up-to-date on activated sludge, anaerobic..)
- Emerging technologies (MBR, biofilm..)
- Natural systems for wastewater treatment
- Decentralized treatment
- Use of brackish and sea water in sanitation
- Financial aspects of wastewater management
- Introduction to reuse of wastewater and sludge
- WHO guidelines for reuse
- Options analysis: introduction + exercise on local case
- Technology selection methodologies and tools (WAWTTAR)
- Technology selection coastal area Spain: case study introduction
- Technology selection coastal area Spain: exercise using WAWTTAR
- Selection of most preferred option using WAWTTAR: exercise on local case
- Option presentations by participants

### Provisional Course schedule/ curriculum

Course schedule/ curriculum				
06.03.2011	Topic	Description	Length	Method/Speaker or Trainer
Session 1	Official opening	Welcome addresses and opening words Introduction of course program	15 min (09:00 - 09:15)	Opening words, Dr. Emad Adly, Omar Abu Eid, Mohammed Bany-Mustafa, Tineke Hooijmans
Session 2	Introduction: (global) status of sanitation	Description of the status of sanitation and issues in water sanitation projects	30 min (09:15 - 09:45)	Presentation Tineke Hooijmans

Session 3	EU water projects	Overview of EU legislation and EU funded projects on wastewater treatment and reuse	30 min (09:45 - 10:15)	Presentation Omar Abu Eid (and Tineke Hooijmans)
Session 4	WHO guidelines for reuse	WHO 2006 Guidelines for safe reuse of wastewater, excreta and greywater: description and explanation via examples	30 min (10:15 - 10:45)	Presentation Tineke Hooijmans
			<b>Coffee (15 min)</b>	
Session 5	Presentations by participants	Introduction of participants: expertise, experience, background, local conditions	1.5 h (11:00-12:30)	Participants presentation
			<b>Lunch (1 h)</b>	
Session 6	Problem analysis	Introductory presentation followed by an exercise on a local case	1.5 h (13:30-15:00)	Participants exercise (Tineke Hooijmans, Koussai Quteishat, Moustafa Moussa)
			<b>Coffee (15 min)</b>	
Session 7	Objectives analysis	Introductory presentation followed by an exercise on a local case	1.5 h (15:15-16:45)	Participants exercise (Tineke Hooijmans, Koussai Quteishat, Moustafa Moussa)
<b>07.03.2011</b>	<b>Topic</b>	<b>Description</b>	<b>Length</b>	<b>Method/Speaker or Trainer</b>
Session 1	Wastewater treatment technologies overview	Summary of On-site systems, Activated sludge, Trickling filters, Rotating Biological Contactors, MBR, Anaerobic reactors, Natural systems (ponds, wetlands)	1 h 15 min (08:30-09:45)	Presentation Moustafa Moussa
Session 2	Decentralized treatment	Benefits of and new developments in decentralized treatment	40 min (09:45-10:25)	Presentation Moustafa Moussa
Session 3	SWIM-ENP	Sustainable Integrated Management Project – relevance to Jordan	20 min (10:25-10:45)	Presentation Susan Taha
			<b>Coffee (15 min.)</b>	
Session 4	Financial aspects of wastewater management	Different financing instruments, the users and strategies	45min (11:00-11:45)	Presentation Koussai Quteishat
Session 5	Reuse of wastewater and sludge	Agricultural use of treated wastewater, re-use concepts, cost effectiveness	45min (11:45-12:30)	Presentation Moustafa Moussa
			<b>Lunch (1 hour)</b>	
Session 6	EU project EXACT	Decision Support System on Wastewater Treatment Technologies. DSS software and a demonstration on DSS.	1.5 h (13:30-15:00)	Presentation, software demonstration Muath Abu Sadah
			<b>Coffee (15 min.)</b>	
Session 7	EU project EXACT	Decision Support System on Wastewater Treatment Technologies. DSS software and a demonstration on DSS.	30 min (15:15-15:45)	Presentation, software demonstration Muath Abu Sadah
Session 8	Options analysis	Introductory presentation followed by an exercise on a local case	1.5 h (15:45-16:45)	Participants exercise (Tineke Hooijmans, Koussai Quteishat, Moustafa Moussa)
<b>08.03.2011</b>	<b>Topic</b>	<b>Description</b>	<b>Length</b>	<b>Method/Speaker or Trainer</b>
Session 1	Technology selection	Methodologies and software tools	30 min (08:30-09:00)	Presentation Tineke Hooijmans
Session 2	Technology selection coastal area Spain	Case study introduction	30 min (09:00-09:30)	Presentation Tineke Hooijmans
Session 3	Technology selection coastal area Spain	Exercise using WAWTTAR	1 h 15 min (09:30-10:45)	Participants software exercise (Tineke Hooijmans, Moustafa Moussa)
			<b>Coffee (15 min.)</b>	
Session 4	Technology selection coastal area Spain	Exercise using WAWTTAR	1.5 h (11:00-12:30)	Participants software exercise (Tineke Hooijmans, Moustafa Moussa)
			<b>Lunch (1 hour)</b>	
Session 5	Selection of most preferred option using WAWTTAR	Exercise on a local case	1.5 h (13:30-15:00)	Participants exercise (Tineke Hooijmans, Koussai Quteishat, Moustafa Moussa)
			<b>Coffee (15 min.)</b>	
Session 6	Final presentation	Options presentations by participants	1 h 45 min (15:15-17:00)	Participants presentation
Session 7	Evaluation	Course evaluation, certificates and closing	1 h (17:00-18:00)	Participants