CONCEPT NOTE
Regional Training on Drought Hazard (DH) Analysis and Mapping" (REG 7), and related Study Tour ST-6
24-27 September 2018, Murcia, Spain

1 INTRODUCTION: THE SWIM-H2020 SM

The SWIM and H2020 SM is a Regional Technical Support Program, funded by the European Commission, Directorate General (DG) NEAR (Neighbourhood and Enlargement Negotiations), that includes the following Partner Countries (PCs): Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, [Syria] and Tunisia. However, to ensure the coherence and effectiveness of Union financing or to foster regional co-operation, eligibility of specific actions will be extended to the Western Balkan countries (Albania, Bosnia Herzegovina and Montenegro), Turkey and Mauritania. The Program is funded by the European Neighborhood Instrument (ENI) South/Environment. It ensures the continuation of EU's regional support to ENP South countries in the fields of water management, marine pollution prevention and adds value to other important EU-funded regional programs in related fields, in particular the SWITCH-Med program, and the Clima South program, as well as to projects under the EU bilateral programming, where environment and water are identified as priority sectors for the EU co-operation. It complements and provides operational partnerships and links with the projects labelled by the Union for the Mediterranean, project preparation facilities in particular MESHIP phase II and with the next phase of the ENPI-SEIS project on environmental information systems, whereas its work plan will be coherent with, and supportive of, the Barcelona Convention and its Mediterranean Action Plan.

The overall objective of the Program is to contribute to reduced marine pollution and a more sustainable use of scarce water resources. The Technical Assistance services are grouped in 6 work packages: WP1. Expert facility, WP2. Peer-to-peer experience sharing and dialogue, WP3. Training activities, WP4. Communication and visibility, WP5. Capitalizing the lessons learnt, good practices and success stories and WP6. Support activities.

2 BACKGROUND: THE NEED TO MAINSTREAM DROUGHT RISK MANAGEMENT

During 2013, under the framework of the SWIM-SM project, a regional assessment[1] of past drought and flood events in the SWIM Partner Countries (PCs) was undertaken, in order to identify their prevailing characteristics (frequency of occurrence, severity/magnitude, and geographic extent) and potential environmental and socio-economic impacts. The assessment also involved a detailed analysis of the prevailing drought management practices and response actions implemented in three focus countries (Jordan, Palestine and Tunisia).

The main finding of the regional assessment, in terms of drought risk, indicated an increasing trend in the occurrence of drought episodes in the partner countries covered by the SWIM Project, expected to be exacerbated by climate change. The assessment also highlighted the existing gaps in drought management, and concluded that the need for effective response to drought risk is paramount, and that the introduction and/or promotion of concepts and methodologies for proactive management in the region is necessary for shifting from the customary “crisis management” paradigm to “risk management”. A well-established risk management system which entails the identification of vulnerability and risk, and incorporates prevention, mitigation and preparedness measures needs to be developed and maintained by governments and other competent actors of the countries of the region. This in turn requires, inter alia, the adoption of enabling policies, robust legal frameworks and proper institutional arrangements at the national and local levels, implementing awareness campaigns, promoting resilience through knowledge, advocacy, research and training, making information available and to up-to date, etc.

Underpinning the above findings, and following the Fact Finding (FF) missions of SWIM and H2020 SM in 2016, and the communicated priorities by the PCs, drought risk management emerged as one of the priority themes for the region. Country requests (under the “Expert Facility”) related to drought risk management (DRM) were translated into Project Identity Form (PIF) and then to Terms of Reference (ToR) already under implementation within the project.

This training workshop which falls under WP3 is part of the SWIM-H2020 work plan in relation to the regional activities; and refers to Activity No. “REG 7” - training on " Drought Hazard (DH) Analysis and Mapping”, and related Study Tour ST-6 ". It will also include a Peer-to-Peer (P2P) session related to the P2P activity no. 7 addressing the DRM.

This event will be organized and held in Murcia, Spain between 25 and 28 September 2018.

[1] Taha, S., Rabi, A., Touzi, S. 2014. Regional assessment of past drought & flood episodes and their management in selected SWIM-SM PCS (Tunisia, Jordan and Palestine). SWIM-SM Report, WP1, Water Governance and Mainstreaming, Activity 1.3.3.1, February 2014 (*accessed 28.03.2016*)

3 OBJECTIVES AND EXPECTED RESULTS

3.1 OBJECTIVES

The overall aim of the regional workshop , which builds on the recommendations made by the participants during the first DRM workshop of December 2016, is to bring together the key stakeholders who are involved in different aspects of DRM in the partner countries, introduce them to the concepts of the Drought Hazard Analysis and Mapping and hold a face to face session between the peers involved in the peer-to-peer process for experience sharing on DRM

The objectives and expected outcomes of the onsite regional training are the following:

Objective: Training of technical staff on (a) drought characterization using suitable indicators, (b) the development of indicators for declaring the drought alert, (c) the development of drought indices, other than the Standard Precipitation Index (SPI) (for example for hydrological and agriculture droughts), and on (d) mapping of the drought hazard.

Outcome: Improved knowledge on the different types of drought indicators, improved technical capacity in the development of the indicators and their analysis to support decision-making, and in the mapping of the drought hazard.

3.2 APPROACH TO MEET THE EVENT OBJECTIVES

To achieve the event objectives, a highly dynamic, interactive, facilitated and participatory approach will be adopted, including the following:

- A study tour to accompany the on-site training with visits to public institutions which offer good examples in drought management.
- Key-Note presentations from distinguished researchers that work both in universities and in private design firms with particular reference to the study area.
- Presentation of the case of Spain in Drought Management Planning (with a view to demonstrate the practical use of drought indicators).
- Presentations and discussion on drought issues for groundwater and issues related to drought monitoring in heavily modified aquifers and groundwater protection zones.
- Presentation and discussion of prevailing drought hazard monitoring experiences in the project countries.
- Specific Training Sessions on “Drought Hazard Monitoring and Early Warning Systems” focused on participatory and hands-on exercises with the participants.
- Specific P2P Session on “Drought Hazard Monitoring and Early Warning Systems” focused on the progress so far gained from the P2P sessions (webinar, questions and answers).

The agenda of the training is designed in a way that permits a balance between inputs from the trainers on new themes and methodology as well as space for experiences exchange among participants and active participation in exercises.

The training will also take into account pressing issues emerging during the sessions.

Copies of the training material will be prepared by the course trainers and will be provided to all participants on a flash memory. A certificate of attendance will be awarded to all the participants at the end of the course

The languages of the Workshop will be English and French

3.3 EXPECTED OUTCOME

- High-level stakeholders are introduced to the main concepts and underlying principles of the drought hazard monitoring as an instrument applied in Drought Risk Management Mainstreaming, and issues arisen during its implementation (transfer of lessons north-to-south);
- The capacity of the technical staff involved in different aspects of DRM in the partner countries is built around specific issues in drought management; as they relate to drought analysis, mapping and monitoring.
- The regional dialogue on issues around drought hazard in semi-arid and arid climates that was initiated during the first regional training on DRMM between decision-makers, experts and international technical experts, across key sectors, is resumed, thus contributing to further establishing the cornerstones for the application of common practices, harmonized approaches, synergetic activities, regional cooperation, etc. in the topics of the training and of mutual interest;
- Stakeholders have conducted targeted participatory hands-on exercises which can be replicated in the PCs with additional stakeholders and peers.

4 TRAINERS AND INVITED SPEAKERS

Trainers

1. Mr Demetris Zarris: SWIM-H2020 SM - Drought Management Expert and Technical Coordinator of the training, LDK, Greece
2. Floris Verhagen: SWIM-H2020 SM - Senior Groundwater (Drought) Non-key expert (NKE), RHDV, Netherlands

Invited Speakers (in the order of appearance)

1. Prof. George Tsakiris, National Technical University of Athens, Greece
2. Dr. Tobias Tornros, Sweco Sweden, previously University of Heidelberg, Germany
3. Dr. Johannes Hunink, FUTUREWATER Inc. Spain Office
4. Dr. Sandra García, University of Cartagena (UPCT), Spain
5. Dr. Salomón Montesinos, Geologist, GEODYM Inc., Spain

The Water Key Expert, Ms. Suzan Taha, will act as resource person and will oversee the harmony of the training workshop and its alignment with the objectives assigned to it.

5 STRUCTURE OF THE REGIONAL ON SITE-TRAINING (REG-7) & STUDY TOUR (ST-6)

Following the successful experience of the REG- 5 in Vienna, Austria, by splitting the Study Tour prior to and after the On-Site Training Event, the structure of the combined event will be as follows.

Day 1 (24th of September) Study Tour: Automated Hydrological Information System, Strategic groundwater pumping network and Sea Water Desalination plant.

Day 2 (25th of September) Regional on Site Training: Mostly presentations and discussions with Training Session #1.

Day 3 (26th of September) Regional on Site Training: Training Sessions #2 and #3, presentations and P2P-9 session.

Day 4 (27th of September)) Study Tour: Irrigation community of Campo de Cartagena and the Waste Water Treatment Plant of Los Alcázares.

The Regional on Site Event (REG-7) will consist of (a) seven presentations and (b) three training sessions. Also a session in the P2P-9 will be included.

The Regional on Site Event will cover all aspects of drought hazard monitoring and assessment

5.1 PRESENTATIONS

Presentations from pioneer scientists and researchers with international acclaimed profile are invited to present their findings and research outcomes to the attendees. The structure of the presentations has been carefully organized in a way that all aspects of drought hazard modelling (in conjunction with the Training Sessions and the Study Tour) are presented in a coherent and holistic way.

The presentations are the following:

1. Drought hazard monitoring and analysis - early warning systems: State of the Art (by Prof. G. Tsakiris) will cover all aspects of the drought hazard monitoring indices and provide recent advances in early warning systems.
2. Addressing drought conditions under current and future climates under climate change scenarios in the Jordan Valley: (by Dr. T. Tornros) will describe drought hazard assessment in the Jordan Valley (where many of the beneficiary countries are situated) and, most interestingly, will focus on climate projections under climate change scenarios.
3. Groundwater drought hazard indices: (by Mr. F. Verhagen) will introduce drought hazard indices tailored to groundwater. This is very significant since merely all beneficiary countries are actually depended on their groundwater reserves.
4. Drought monitoring with remote sensing and satellite imaging: (by Dr. J. Hunink) will describe and explain how remote sensing and satellite imagery can help with drought hazard assessment and present sources of data available over the internet.

5. Operational early warning system for drought based on seasonal precipitation input in Israel: (by Mr. A. Givati) will present how Israel is technologically capable of predicting droughts to be prepared to mitigate its adverse effects.

Crop production and agricultural drought monitoring: (by Dr. S. Montesinos) is very important for countries with significant percentage of rainfed agriculture. New techniques for the monitoring of agricultural drought will be presented.

5.2 TRAINING SESSIONS

Training Session #1: The scope of this Training Session is to explore the Drought Hazard Monitoring issues, calculating the drought hazard indices, recognizing the onset of a drought event, its duration and intensity, its severity and finally declaring its end. Real data will be used from the Republic of Cyprus, area with very similar characteristics with most of the beneficiary countries. The data include rainfall, potential evapotranspiration, runoff, etc. The attendees will work (hands on) with their personal computers with two software models (freeware), namely (a) the SPI Calculator developed by the World Meteorological Organisation (WMO), and (b) the DrinC model for the calculation of RDI and SDI indices (alongside with SPI) developed by the National Technical University of Athens.

Training Session #2: The scope of this Training Session is to explore the Drought Hazard Monitoring issues focused on groundwater. Groundwater resources are very important for the beneficiary countries and the identification of drought especially for groundwater is equally important. Drought hazard indices tailored for groundwater will be explored by using rainfall and aquifer elevation data especially adjusted for processing within the limited time available.

Training Session #3: The scope of this Training Session is to explore the Drought Hazard Monitoring issues using remote sensing technologies.

IT IS EXPECTED THAT ALL ATTENDEES WILL HAVE THEIR LAPTOPS WITH THEM AND THE NECESSARY SOFTWARE WILL BE ALREADY INSTALLED PRIOR TO THE COMMENCEMENT OF THE EVENT. ALL SET-UP FILES WILL BE SENT TO ATTENDEES BY EMAIL SOON.

6 AGENDA

Day 1:24/09/2018

Item	Time	Activity	Speaker	Location
	8:45-9:00	Meeting at the hotel lobby		Hotel occidental 7 coronas, MURCIA
	9:00-9:15	Walk from the hotel to the Confederación Hidrográfica del Segura (CHS)		Murcia
	9:15-9:30	WELCOME by the Chair of the Segura River Basin Authority	Mr. Mario A. Urrea	
#1	9:30-9:50	Drought & Flood monitoring: Automated Hydrological Information System	Juan Carlos Caballero (ESP/SEG)	

Item	Time	Activity	Speaker	Location
#2	9:50-10:10	**Presentation:** How drought indicators are practically used within a Drought Risk Management Plan? The case of Spain	Fraile Jiménez de Muñana Jaime Loreto (ESP/SEG)	
#3	10:10-10:30	Extraordinary measures for droughts: Strategic groundwater pumping network	Alfonso Lujano (ESP/SEG)	
	10:30-11:00	**Coffee break**		**CHS**
	11:00-11:10	Travel from CHS to La Fica AIHS Station and SPN Station by bus		Murcia > La Fica
#4	11:10-12:30	Visit to one of the stations within the Automated Hydrological Information Network Visit to one of the boreholes within the Strategic Pumping Network	J.C.Caballero/A. Lujano	LA FICA
	12:30-13:00	Travel from La FICA to Cartagena, Headquarters of the "Campo de Cartagena Irrigators Community" (CRCC) by bus,		La Fica> Cartagena
#5	13:00-14:00	Visit to CRCC headquarters, presentation: • Irrigators Communities with water saving technologies: Campo de Cartagena	Pablo del Amor (ESP/Campo de Cartagena Irrigator's Community)	CRCC Headquarters Paseo Alfonso XIII, 22, 30201 Cartagena
	14:00-16:00	**Lunch break**		**Cartagena**
	16:00-16:25	Travel from Cartagena to GREENHOUSE at Torre Pacheco		Torre Pacheco
#6	16:25-17:30	Visit to Water Saving GREENHOUSE at Torre Pacheco	P. Del Amor	Torre Pacheco
	17:30-18:00	Travel from Torre Pacheco to the Hotel.		Torre Pacheco> Hotel occidental 7 coronas, MURCIA

Day 2: 25/09/2018

Item	Time	Description	Speaker
	8:30 – 9.00	Registration	
#7	9:00 – 09:30	Welcome remarks Presentation of the "Sustainable Water Integrated Management and Horizon 2020 Support Mechanism" project (10 mins)	Suzan Taha (SWIM-H2020 SM Key Water Expert)
		Presentation of the workshop objectives and agenda (10 mins) Pre-training Assessment/Quiz (10 mins)	Demetris Zarris (SWIM-H2020 SM Drought Hazard Non-Key Expert, LDK)

#8	09:30 – 10:15	Drought hazard monitoring and analysis - early warning systems: State of the Art	Prof. George Tsakiris (National Technical University of Athens, Greece)
#9	10:15 – 11:00	Addressing drought conditions under current and future climates under climate change scenarios in the Jordan Valley 5-10 min overview per country about drought hazard monitoring strategies in each country Interactive discussion	Dr. Tobias Tornros (Sweco Sweden, previously University of Heidelberg, Germany) Partner Country Representatives
	11:30 – 11:45	**Coffee Break**	
#10	11:45 – 12:15	Groundwater drought hazard indices	Floris Verhagen (SWIM-H2020 SM, Senior Groundwater (Drought) NKE, RHDV))
#11	12:15 – 12:45 12.45 – 13.30	Drought monitoring with remote sensing and satellite imaging Interactive Discussion (45 min)	Dr. Johannes Hunink (NED/FUTUREWATER Inc.)
	13:30 – 14:30	**Lunch Break**	
#12	14:30 – 16:30	Training Session 1: Drought Hazard Monitoring Example from real data from the Republic of Cyprus. Plenary: Explanation of the Breakout Sessions • Rainfall data quality assessment. • Introduction to DrinC and WMO software programs. • Drought Hazard indices based on precipitation and evapotranspiration. • Drought Hazard indices based on runoff series. • Drought identification and characterization	Demetris Zarris (SWIM-H2020 SM Drought Hazard Non-Key Expert, LDK)
	16:30 – 16:45	**Coffee Break**	
#13	16:45 – 18:00	Training Session 1: Continued	Demetris Zarris (SWIM-H2020 SM Drought Hazard Non-Key Expert, LDK)

Day 3:26/09/2017

Item	Time	Description	Speaker
#14	9:00 – 9:30	Operational early warning system for drought based on seasonal precipitation input in Israel (20 mins) Q&A (10 mins)	Dr. Amir Givati Head of Surface Water and Hydrometeorology Department - Israeli Water Authority
#15	9:30 – 10:00	Recent advances in drought hazard monitoring and climate change impact assessment over Spain (20 mins) Q&A (10 mins)	Dr. Sandra García, ESP/University of Cartagena (UPCT)
#16	10:00 – 10:30	Crop production and agricultural drought monitoring (20 mins) Q&A (10 mins)	Dr. Salomón Montesinos, Geologist, GEODYM Inc., Spain
	10:30 – 10:45	**Coffee Break**	
#17	10:45 – 13:30	Training Session 2: - Explanation of the Breakout Sessions - Plenary - Groundwater Drought Hazard Monitoring (Break out session)	Floris Verhagen (SWIM-H2020 SM, Senior Groundwater (Drought) NKE, RHDV)
	13:30 – 14:30	**Lunch Break**	
#18	14:30 – 16:45	Training Session 3: - Explanation of the Breakout Sessions - Plenary - Drought Hazard Monitoring with Remote Sensing Techniques (Break out session)	Dr. Salomón Montesinos, Geologist, GEODYM inc., Spain
	16:45 – 17:00	**Coffee Break**	
#19	17:00 – 18:30	Plenary: Overview of the peer-to-peer process - Peer-to-peer: Review of the P2P process - Peer-to-peer: next steps and actions, planning of the activities -Closing of the Workshop (15' min) including: • Post training Assessment/Quiz • workshop evaluation • Photos • Distribution of Certificates	All Facilitator: Demetris Zarris (SWIM-H2020 SM Water Non-key Expert – P2P Coach)) Rapporteur: Demetris Zarris (SWIM-H2020 SM Water Non-key Expert – P2P Coach)

Day 4:27/09/2018

Item	Time	Activity	Speaker	Location
	8:45-9:00	Meeting at the hotel lobby		Murcia
	9:00-10:00	Travel by bus to San Pedro del Pinatar Seawater Desalination Plant		Murcia>San Pedro del Pinatar
#20	10:00-11:30	Visit to San Pedro del Pinatar Seawater Desalination Plant (SDP)	Rubén Navarro, MCT	San Pedro del Pinatar
	11:30-11:50	Travel by bus from San Pedro del Pinatar SDP to Los Alcázares		San Pedro del Pinatar>Los Alcázares
	11:50-12:20	**Coffee break**		**Los Alcazares**

	12:20-12:30	Travel by bus to Los Alcazares Waste Water Treatment Plant (WWTP)		Los Alcazares
#21	12:30-14:00	Visit to Los Alcazares WWTP	Marcos Pérez, ESAMUR	Los Alcazares WWTP
	14:00:14:15	Travel by bus from Los Alcazares WWTP to Restaurant (to be confirmed)		Los Alcazares
	14:15-16:15	**Lunch break**		**Los Alcazares**
	16:15-17:00	Travel by bus from restaurant at Los alcazares back to Murcia (HOTEL)		Los Alcazares>Murcia