# Workshop Summary

## "Youth Innovating with Wastewater for a Sustainable Mediterranean" Workshop

## Villa Valmer, Marseille

## 21-22 March 2017

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Every year, World Water Day draws the world's attention to key global water issues. World Water Day 2017 focused on Water and Wastewater, and how wastewater is a valuable resource in the circular economy and can be safely managed as an efficient investment in the health of humans and ecosystems. To celebrate World Water Day, the Center for Mediterranean Integration, the World Bank, Switch-Med and supporting partners (CIHEAM, Global Water Partnership Mediterranean and World Youth Parliament for Water) organized the "Youth Innovating with Wastewater for a Sustainable Mediterranean" workshop, which welcomed 65 youth participants and experts from 17 Mediterranean and European countries to discuss wastewater and its essential role in increasing water security in the Mediterranean. Wastewater has a key role to play in agriculture, domestic water use (e.g. sanitation), industry, aquifer recharge and landscape restoration, amongst others. However, negative perceptions related to wastewater limit its safe use. Better understanding how and where it can be used safely is an important step in making wastewater socially acceptable.

### Objectives

The objectives of this workshop were to:

i) contribute to regional water consciousness and to change negative perceptions of wastewater by exploring its potential as a resource.
ii) stimulate inter-generational mutual learning between Mediterranean youth and water practitioners.
iii) share and promote innovative projects by youth working on water at all levels.
iv) strengthen awareness on water scarcity as a common regional public bad in the Mediterranean.

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## The Mediterranean Water Heroes Contest

In the months preceding the workshop, the Center for Mediterranean Integration, the World Bank and Wamda launched and promoted the Mediterranean Water Heroes Contest, which gave the opportunity to young water experts and activists from around the region to present and promote their wastewater related work in English or Arabic. In only 4 weeks, 84 applications were received in total from around the Mediterranean. CMI internally selected and invited the best applicants and invited them to the workshop in Marseille. Furthermore, 3 contest winners were selected to present their work at the workshop[1] and were awarded free registration to Stockholm World Water Week (27 August-1 September 2017) by CMI, in an effort to promote the voice of Mediterranean youth working on water at this upcoming global event on water.

[1] Referred to as "Mediterranean Water Heroes Contest Winner" in the rest of the report.

## Welcome

Mourad Ezzine, Manager of the Center for Mediterranean Integration, opened the workshop with a welcome to all participants and partners, noting the pressing challenges facing the Mediterranean in terms of water scarcity and how working towards increased water security is a precious employment and educational opportunity for Mediterranean youth.

## Opening Remarks

- **Richard Abdulnour, Senior Water and Sanitation Specialist, Water Global Practice, World Bank – "Managing Water Scarcity in the Mediterranean"**

Richard Abdulnour presented the scale of the water challenge in the Mediterranean and how wastewater is instrumental in facing it to increase water security in the region. Indeed, by 2050 the global challenge will be to provide twice as many people with half of the water resources available today. To do this, the predominant linear perspective on water use (use and dispose) must be replaced with a circular one (use, treat and reuse). He also highlighted the dire effects of rampant water mismanagement in the region, which can potentially lead to political conflicts.

To reduce the regional water footprint, it is essential to close the water loop by increasing supply from non-conventional sources e.g. by recycling wastewater for domestic, agricultural and industrial purposes, while further bolstering water security by recharging aquifers in the region: this is "Water 4.0 ". Several global examples of best practices related to wastewater reuse can provide inspiration in the Mediterranean, notably the examples of California, Namibia and Singapore. Indeed, it is necessary to map out the existing solutions in the world to further inspire water practitioners and encourage them to collaborate. For instance, the World Bank Water Scarce Cities initiatives bolsters awareness of effective approaches to build urban water security and climate resilience across the MENA region.

- **Dr. Nidal Salim, Director General, Global Institute for Water and Environment, Switzerland**

Nidal Salim stressed the fact that water is one of the main pillars of the 2030 Sustainable Development Goals ("cf. Goal 6: Clean Water and Sanitation"). Water is not only a natural

resource. It is also a political object and an economic good, and will be the subject of increased competition in the future, especially in the Mediterranean.

All aspects of water (Freshwater/Sanitation Water/Water Quality/Water Infrastructure/Integrated Resource Management/Ecosystems) are all linked to wastewater. In order to address these problems, it is essential to empower youth through an integrative approach.

At present, wastewater is still a very under-utilized resource which poses grave environmental and health threats: over 80% of wastewater is not collected or treated worldwide. Every day, over 2 million tons of human waste are disposed of in water courses. Water, energy and land are strongly inter-related and will become the subject of increased competition in the future.

- **Dr. Alice Bouman-Dentener, Honorary Founding President of the Woman for Water Partnership – "Youth, a Key Stakeholder for Water Security"**

Alice Bouman-Dentener argued that SDGs call for engagement at all levels of society targeting all sectors. In order to make progress towards achieving the 2030 SDG goals, it is necessary to involve youth as an integral part of the process. Indeed, groups like youth, women, indigenous people and civil society groups have often been regarded as targets of development work, but not as integral actors of the latter.

To address the issue of water, it is therefore essential to think outside the 'water box' in purely technical and practical terms. Raising awareness about water to increase Mediterranean water security requires a more holistic effort. Indeed, stakeholder participation should occur at the different levels of governance in order to transform existing management cultures and practices. To make participation meaningful, substantial investments are required in capacity development and education, in particular at local levels in developing countries where many of the poor and vulnerable are living.

## Icebreaker: Round of Presentations and Reality Check

As an icebreaker, participants were asked to briefly introduce themselves to other participants sitting at their tables, and to collectively answer the questions: "What is your water reality? Is wastewater used and/or perceived as a valuable resource where you live?" and to map their responses on flipcharts.

## Session 1: Creating a Water Secure Mediterranean by 2030

*This session adopted a holistic approach to the water challenge in the Mediterranean, illustrating how regional technical, educational and awareness-raising solutions are needed to build a water secure future for the Mediterranean by 2030.*



- ***Mediterranean Water Heroes Contest Winner*: Tawfik El-Moussaoui, PhD Student, Cadi Ayyad University, Morocco - "Treated Urban Wastewater Reuse in Sustainable Irrigation: An Innovative WWTP"**

Tawfik El-Moussaoui began Session 1 by presenting his work on using treated urban wastewater from Marrakech for sustainable irrigation, notably in peri-urban agriculture and forestry. The pilot project in collaboration with the Food and Agriculture Organization is currently underway in a 10 hectare area of forest located near Marrakesh. These techniques present regional relevance for the region to reuse and valorize treated wastewater. Mr. El Moussaoui, also presented the educational and water-awareness raising activities that the project engages in to further sensitize youth and schoolchildren to water issues.

- **Yasmine Seghirate, International Center for Advanced Mediterranean Agronomic Studies, France "Zero Waste in the Mediterranean - Natural resources, food and knowledge" and Dr. Roula Khadra Mediterranean Agronomic Institute of Bari, Italy - "Drivers, Constraints and Prospects with Particular Emphasis on Agriculture"**

Yasmine Seghirate and Roula Khadra made a joint presentation, beginning with an overview of the latest CIHEAM/FAO "Zero Waste in the Mediterranean: Natural Resources, Food and Knowledge" report which was offered to workshop participants. The report describes how the waste of natural resources, waste of food, and waste of knowledge are all inter-linked in the Mediterranean. Yasmine Seghirate argued that implementing more sustainable policies all along the agricultural and food chain can result in significant waste reduction at all levels, including wasted water. Food waste and losses in the Mediterranean region is equivalent to USD 50 Billion annually, in terms of farm gate prices. Indeed, the waste of knowledge and human capital in the region greatly impacts its capacity to address the challenge of water security. Dr. Roula Khadra followed with a presentation of several facts and estimations on the future of water accessibility. The numbers show that population growth, the decreasing amount of water left and the decrease in quality of water due to overexploitation all amplify the challenges that the region is already facing.

❖ **Mariela Antonakopoulou, Assistant Program Manager, Global Water Partnership Mediterranean, Greece – "Non-Conventional Water Resources (NCWR) Program in the Mediterranean"**

Ms. Mariela Antonakopoulou (Greece) showcased the working of the Non-Conventional Water Resources Program in the Mediterranean region. With an introductory video, she explained how local water security is being improved in Greece, Cyprus, Italy and Malta. Examples of projects are rainwater harvesting and storm water management as well as greywater recycling at the local level. Also, capacity building and youth engagement were also part of the projects, training local young technicians to increase local knowhow and capacity on Non-Conventional Water Resources.

## ➢ Session 1 Team Activities: Imagining a 2030 Zero Waste Future in the Mediterranean

The first team activity of the workshop was facilitated by Roula Khadra and Mariela Antonakopolou, and consisted of a "back-casting" and mapping exercise. Using the example of a small Mediterranean island, participants were asked to imagine a sustainable water future in which water and wastewater were used cyclically. Participants were divided into task forces to work on the following themes:

- Implementation of Technologies
- Education
- Youth Engagement
- Awareness Raising
- (International) Cooperation / Partnerships
- Policies and Governance
- Investments

Each team mapped out their ideas on how to make progress on these themes to imagine what a Mediterranean Zero Waste Future could resemble in 2030, and shared their ideas and recommendations in the plenary. For instance, the youth engagement team recommended involving youth in the decision-making process, by granting them formal representation in governing bodies (milestone). Also, to promote the topic of water amongst youth, the team advised governments to appoint water management students as water ambassadors, informing other youth about the ins and outs of the water sector, while promoting water management by providing scholarships for specific studies.

## Session 2: The Multiple Uses of Wastewater



*This session provided a technical, evidence-based exploration of the multiple uses of wastewater, while addressing the question of health and public acceptance of this resource. IRSTEA's Wat-A-Game gave participants the opportunity to learn about the opportunities and challenges facing treated wastewater reuse in a variety of settings.*

- ***Mediterranean Water Heroes Contest Winners:*** **Ola Odel and Hoda Ellatar, Zewail City of Science and Technology: "Decentralized Waste Water Treatment Units for Rural Areas in Egypt"**

Ola Odel and Hoda Ellatar presented the work of their 6-member team to reduce the environmental and health risks posed by discharging wastewater into the Nile River in Egypt by developing small, low-cost and low-tech decentralized wastewater treatment units for rural households in Egypt, who are often exposed to numerous health and environmental risks due to wastewater that is directly discharged into waterways, polluting both water and soil.

In the system, small treatment plants are installed on house roofs, which use natural sedimentation processes, algae growth through sunlight exposure and the moringa tree (*moringa oleifera*) to treat wastewater naturally and make the treated wastewater available for a variety of other uses, while involving all stakeholders on the issue of reusing wastewater.

- **Dr. Nicolas Condom, CEO, Ecofilae, France - "Water Reuse: from the Idea to Sustainable Multi-Use Application"**

Nicolas Condom gave an overview of the technical applications, global best practices and perceptions of wastewater, which prepared participants for the team activities on wastewater reuse that followed.

- **Session 2 Team Activities: IRSTEA (National Research Institute of Science and Technology for Environment and Agriculture), France "Serious Game" on Wastewater Reuse: WAG Reuse**

During this "serious game", 5 facilitators from IRSTEA enabled the workshop participants to simulate a real-life water scenario with a focus on wastewater. Divided in teams, participants impersonated different stakeholders living, working, producing and consuming along the same river basin. Each user had to assess how her/his activities impacted the water resources available in terms of water consumption, wastewater production and environmental impacts while generating revenue. Participants were then asked to think about how their wastewater

could be productively reused by other users in the area to reduce the risk of discharging contaminated wastewater in the river, thereby highlighting the need for cooperation between upstream and downstream areas as well as between all stakeholders.

At the end of the game, a collective debrief highlighted the challenges and opportunities that the players experience in achieving an economically, environmentally and socially sustainable water use and reuse framework in their hypothetical scenarios, while emphasizing the different ways to reuse wastewater that they were able to imagine.

Participants also received mini-WAT wastewater reuse game kits in order to organize their own wastewater reuse games and water awareness-raising sessions back home. Utilization of the game kits will be monitored by IRSTEA.

## Session 3: Solutions Marketplace

*In this short morning session,* ***Mediterranean Water Heroes Contest*** *Participants had the opportunity to pitch their wastewater work to the workshop participants based on a revolving table format. This allowed all participants to gain a better understanding of the many different ways that wastewater can be treated and used in the Mediterranean, and prepared the next business design session.*

## Session 4: Wastewater and the Circular Economy

*This session explored the concept of circular economy, and how reusing treated wastewater can help to create new environmentally sustainable opportunities for youth employment in the region.*

- ***Mediterranean Water Heroes Contest Winner*****: Baya Aissaoui, National Institute of Agronomy of Tunisia, "Valorization of Treated Wastewater by Aquapony"**

Baya Aissaoui is currently developing Tunisia's first aquaponic farm system using treated wastewater. Aquaponics allows for the production of fish and vegetables in a closed loop system, in which water and nutrients produced both by the fish and vegetables are reused in the system. Furthermore, instead of using clean water, this system purifies and reuses treated wastewater. Aquaponics is a viable solution in both urban and rural settings, and is a good illustration of circular economics in practice. It holds great potential in "relocalizing" food production (e.g. for urban agriculture in cities) and for promoting local economic development.

❖ **Matthew Lagod, Project Manager, Switch-Med Networking Facility hosted by SCP/RAC, Spain - "The Link between Wastewater Reuse, Life-Cycle Thinking and the Circular Economy"**

Matthew Lagod presented the three main principles of the circular economy concept to the audience:

- Principle 1: To preserve and enhance natural resources

  ...by selecting resource inputs wisely and by favoring technologies and processes that use renewable resources and minimize pollution.

- Principle 2: Optimize resource use

  ...by designing products for remanufacturing, refurbishing, and recycling to keep components and materials circulating in and contributing to the economy.

- Principle 3: Develop innovative business models

  ...that keep the economy evolving towards greater resource efficiency and fewer impacts on the environment.

The Switch-Med program supports Small and Medium Enterprises and green startups to achieve resources efficient and sustainable production models based on circular economic principles. It currently counts pilot projects in more than 120 industries in 8 Mediterranean countries, and offers innovation training and incubator programs to Mediterranean green entrepreneurs. More than 1600 entrepreneurs have been selected and trained, and 150 have already launched their innovation ideas, two of which then presented their innovative work.

❖ **Abdelkrim Bessadok, Switch-Med Green Entrepreneur, Queen Luzerne de Gabès, Tunisia - "Treated (waste)water for Irrigation of Alfalfa in Tunisia: A Promising Opportunity to support High-Quality Grazing Crops and Economic Opportunities for Youth"**

Mr. Bessadok, presented his green economy project, which uses treated wastewater for the irrigation of alfalfa in Tunisia. Alfalfa is a productive, high-quality, nutrient rich grazing crop that restores soils and is also fit for human consumption. With his company, Mr. Bessadok is creating new employment opportunities for youth in rural areas while contributing to local economic, environmental and social sustainability.

❖ **Lina Al-Kurdi, Switch-Med Green Entrepreneur, Green Roof, Jordan – "Rainwater, Greywater and Efficient Irrigation of Green Roofs in Jordan"**

Ms. Al-Kurdi presented her green economy business for which she received training and financial support from Switch-Med. Her company, Lina Energy, creates green roofs for houses and buildings in Jordan. Green roofs can be grown using treated wastewater, and also provide urban wildlife habitat, capture and store carbon and water, create soil, reduce urban heat island effects, and enhance city aesthetics.

**Session 4 Team Activities: Switch-Med Green Business Canvas, Switch-Med hosted by Regional Activity Center for Sustainable Consumption and Production, Barcelona, Spain**

In this team activity session, participants formed teams to collectively design a business idea based on treated wastewater reuse and circular economic principles using the Switch-Med Green Business Canvas. To do this, each team had to define the mission, vision and objectives of their business idea, as well as the key stakeholders, key activities and resources, value proposition, target customers, cost structure and revenue streams. Each team then pitched their business idea in a plenary session, explaining how reusing treated wastewater had the potential to increase the economic, environmental and social sustainability of their business.

## Session 5: COOPLAN Project Design

**Facilitators: Nils Ferrand and the IRSTEA team**

*IRSTEA's COOPLAN participatory planning tool gave the participants the opportunity to co-design a wastewater reuse project in teams in order to push their Session 4 business project idea further and reflect on how it could engage with other stakeholders, notably public policymakers and territorial governance bodies.*

## Session 6: Creating a Mediterranean Water Youth Network

*This session closed the workshop by encouraging participants to brainstorm on how Mediterranean youth can connect and work together on wastewater and water-related questions after the event within the context of the 2030 Agenda for Sustainable Development.*



**Speakers: Alice Bouman-Dentener, Honorary Founding President of the Women for Water Partnership and Asma Bachikh, World Youth Parliament for Water**

Alice Bouman-Dentener stressed that youth is part of all stakeholder groups and can therefore be the connecting factor within the water sector. She added that to create an effective multi-stakeholder partnership, it is crucial to agree on a common mission and vision from the start. Asma Bachikh then introduced the World Youth Parliament for Water to explain the workings of an already existing youth network in the water sector, stressing the importance of youth leadership and commitment to the cause of the network. Asma shared several examples of youth-led local actions carried out by members of the WYPW to showcase the influence of a youth network on local communities. Lastly, with its diversity of academic backgrounds and expertise, you can facilitate cooperation between all disciplines throughout the Mediterranean.

### ➢ Session 6: Team Activities: Creating a Network?

The participants were divided into different groups which were each headed by one of the WYPW discussion moderators. Supported by a few questions, the youth participants discussed the potential of creating a Mediterranean youth network, discussing its aims, activities, structure and the forms of support required. After the discussion, plenary feedback was provided by each of the moderators. Most groups agreed that a MED network would contribute to:

- Increased participation of stakeholders in different processes
- increased exposure of youth's work and knowledge,
- the promotion of youth-led actions,
- increased opportunities for partnerships between youth and other stakeholders,
- increased access to senior water experts and other organisations,
- greater diversity of skills and backgrounds,
- acknowledgement of country specific issues and
- the empowerment of youth in terms of action implementation and active involvement in the decision-making processes

With regards to the support that this network would need, it was agreed upon that the following conditions must be put in place:

- Financial support for project coordination, logistics and material costs,
- Expert support for project implementation (e.g. technical)
- Long-term cooperation with scientific experts and other stakeholders to facilitate multi-stakeholder cooperation.
- Government acknowledgement of youth as a legitimate stakeholder to establish cooperation and approval regarding youth led actions and projects



Next, the room engaged in a plenary feedback session. Everyone was invited to give input and share their expectations and ideas as well as concerns about the creation of this network.

The main points that came up were:

- The importance of involving committed people in this kind of project, to give it substance and stability
- Cooperating and communicating with NGOs and structures in the region and make use of what has already been built to make this project successful
- Despite the need of an intergenerational cooperation there is a need for youth to take its rightful place among the other stakeholders and not wait to be handed a role

CMI argued that it would not be necessary to commit to the network right away, while advising the youth participants to make use of the momentum and continue working on the results of the conference. Furthermore, CMI emphasized that CMI could support and facilitate the network, but not initiate it.

On a final note, Asma Bachikh advised the participants to first critically reflect upon their individual commitment and willingness to act for this network, pointing out that the success of the network is mostly dependent on the people behind it.