

Grant Agreement n. 692162

FOWARIM

Fostering Water-Agriculture Research and Innovation in Malta

Summer School

2nd – 6th of July 2018

Malta College of Arts, Science & Technology Main Campus

(Triq Kordin, Paola, PLA9032 Malta)



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CONTENTS

Introduction to the 2nd Summer School	3
The Project	5
Learning Objectives	7
Intended Audiences	8
Practical Information	9
Directions to MCAST Main Campus	10
List of Speakers and Lecturers	11
Summer School Agenda	13

Introduction to the 2nd Summer School

Water consumption has been driven by a growth in demand as a result of the increasing commercial integration worldwide.

Freshwater resources per inhabitant are considered as an important indicator for measuring the sustainability of water resources. According to the United Nations World Water Development Report, a country experiences 'water stress' when its annual water resources drop below 1,700m³ per inhabitant. Among the EU Member States, Malta has recorded the lowest volume of water resources (220m³ per person). In addition, between 2005 and 2015, Malta was the fastest growing country in terms of the volume of freshwater extracted (+40%).

Agriculture plays a key role in the consumption of water resources and in its strong interrelations with other economic sectors. According to data published by the community agency Eurostat, in its report on Agricultural, Forestry and Fisheries Statistics 2016, Malta is the country with the highest average cubic meters of water used per hectare on irrigated land (9.956m³/ha).

These statistics highlight that the sustainable management of the water resources in Malta is imperative for ensuring the health of the population and its ecosystems.

The circular economy is an economic concept interrelated with sustainability: its objective is that the value of products, materials and resources (water, energy, etc.) are sustained in the economy for as long as possible, and that the generation of waste is minimised.

In 2015, under the slogan "Close the Circle", the European Commission designed its 'Action Plan for the Circular Economy' [COM (2015) 614 final], with the main purpose of facilitating and promoting the transition to the circular economy.

In addition, the Action Plan seeks to contribute to achieving the Sustainable Development Goals (SDGs) established in the 2030 Agenda for Sustainable Development, adopted by the United Nations in September 2015.

In the context of water, the Action Plan pays special attention to the promotion of water reuse, for which various actions will be undertaken in order to eliminate existing regulatory barriers, disseminate the benefits of water reuse, as well as its promotion through lines of research and financing.

Specifically, the actions in the axis of water reuse are:

1. Regulatory adjustment for the promotion of reusing reclaimed wastewater;
2. Preparation of a guide with a view to the implementation of the regulation instrument in the European area;
3. Support irrigation projects whose resources include the reuse of wastewater;
4. Actions included in River Basin Management Plans (RBMPs);
5. Promotion of research work to establish the minimum quality criteria required for reused water from a sanitary and environmental point of view.

Different platforms, such as the Circular Economy Finance Support Platform (January 2017) and the EU Platform on Food Losses and Food Waste (November 2016) foster dialogue and exchange on the circular economy and strengthen stakeholder synergies. Together, they face the challenges of transitioning towards the circular economy and taking the EU towards this goal.

It is estimated that in the period leading up to 2030, the circular economy can generate a profit of 1.8 billion euros in the European Union as a whole, which is 0.9 billion more than the current linear economy model. The European Commission also calculates a saving in raw materials by the industry of 600,000 million euros (8% of the annual turnover of the EU in 2015) and estimates that the creation of employment represents around 580,000 new work positions associated with the new model.

To address these challenges, from 2nd to 6th of July, 2018, the FOWARIM project – Fostering Water-Agriculture Research and Innovation in Malta – is organising the second FOWARIM Summer School. This Summer School presents a unique opportunity for the participants to understand the key concepts of circular economy with respect to the water and agriculture sectors.

In addition, participants will be provided with information on Smart farming in EU which attempts to establish a balance between the rising demand for agricultural products, the need to protect the environment and finding innovative ways to “produce more with less”. Emerging new technologies and methods offer the prospect of boosting productivity and profit margins and increase European competitiveness worldwide.

THE PROJECT

The objective of the FOWARIM project is to strengthen the research capacity of the Malta College of Arts, Science & Technology's (MCAST) Water Research and Training Centre in four crucial themes related to the field of water use in agriculture:

- Decreasing Water Demand;
- Making Use of Alternative Sources of Water;
- Renewable Desalinization, On-Farm Desalinization and Utilization of Saline Water;
- Decreasing Negative Environmental Externalities Caused by Nutrient-Rich Farm Waters.

FOWARIM is a Coordination and Support Action (CSA) project that has received funding from the European Union's Horizon 2020 Programme for Research and Innovation under Grant Agreement no 692162.

The duration of the project is 36 months from 1st January 2016 until 31st December 2018. The following seven organisations comprise the project consortium implementing the FOWARIM project:

- Malta College of Arts, Science & Technology (Coordinator, Malta);
- Ministry for Sustainable Development, the Environment and Climate Change (Malta);
- Centro Internazionale di Alti Studi Agronomici Mediterranei – Istituto Agronomico Mediterraneo di Bari (Italy);
- Europe for Business Ltd (United Kingdom);
- Cranfield University (United Kingdom); and
- The Universitat Politècnica de Catalunya (Spain).

Summer School Organizer:



In partnership with:



environment.gov.mt ^{*}

Summer School Supporter:



Communication and Dissemination:



LEARNING OBJECTIVES

The main objective of the Summer School is to raise awareness and sensitization on the importance of moving from the linear economy towards a circular economy.

The 2nd Summer School FOWARIM aims, through the intervention of leading international experts, to demonstrate in a practical way, the importance of technological innovation in agriculture with respect to circular economy. In this way, a balance can be achieved between gaining environmental benefits whilst also improving the competitiveness of companies / farmers by increasing their profits and creating greenjobs.

The 2nd Summer School will foster a **more participatory and practical approach of the students**; and promote **interaction between students and farmers and policy makers**. In this way, attendees will acquire **useful and applicable knowledge for future use**.

The Summer School is divided into the following modules:

1st Module: Water Management, Governance and Policy

Objective: Provide the participants with a clear snapshot of European Water Management, Governance and Policy in relation to the circular economy.

Methodology: Theoretical & practical approach, studying funded projects.

2nd Module: Innovative Water Technologies

Objective: Provide the participants with a clear snapshot of the most important and innovative Water Technologies related to the circular economy, examining the following 'state-of-the-knowledge' examples: Environmental Impact Assessment on Aquatic Media, Water and Energy, Water Reuse and Groundwater Restoration.

Methodology: Best practice approach in circular economy in relation to water agriculture; Lessons learned from existing project results; Lab study visit; and engagement with SMEs and civic society organizations.

3rd Module: Research and Innovation support to young researchers and SMEs

Objective: Provide participants with the concepts, methodologies and tools for improving competitiveness within the circular economy and water sector. Particular attention will be given to IPR – Intellectual Property Rights and business models for water agriculture.

Methodology: best practice exercises and business case studies, including a visit to the Water Services Cooperation.

By taking part in this course, participants will be able to network with colleagues and exchange experiences with experts (both experienced farmers and young farmers). In addition, students will take part in two visits so that they can experience how a farm is managed through a circular economy and exchange views with experts in the water sector.

On completion of the course, each participant will receive a certificate of completion from Malta College of Arts, Science & Technology (MCAST).

INTENDED AUDIENCES

The summer school will have places for a maximum of 25 participants.

It is intended to reach the widest possible audience, and aims to include participants from local authorities, farmers' associations, and other relevant stakeholders.

Practical Information

The FOWARIM Summer School is free of charge.

Training-related costs covered by the project include coffee-break refreshments, training materials, and travel costs for course-related site visits. Also included is the networking dinner scheduled to take place on the last day. This will provide the opportunity to exchange opinions and engage in discussion.

Travel to and from the MCAST Main Campus and accommodation costs are not included.

The course language is English.

The application form will be available online, and the deadline for the registration is 30th June 2018.

For more information, visit the FOWARIM website at <http://fowarim.eu/> or email us directly: Carmen Muñoz, email: cmunoz.efb@gmail.com

DIRECTIONS TO MCAST MAIN CAMPUS

Malta College of Arts, Science & Technology (MCAST) Main Campus

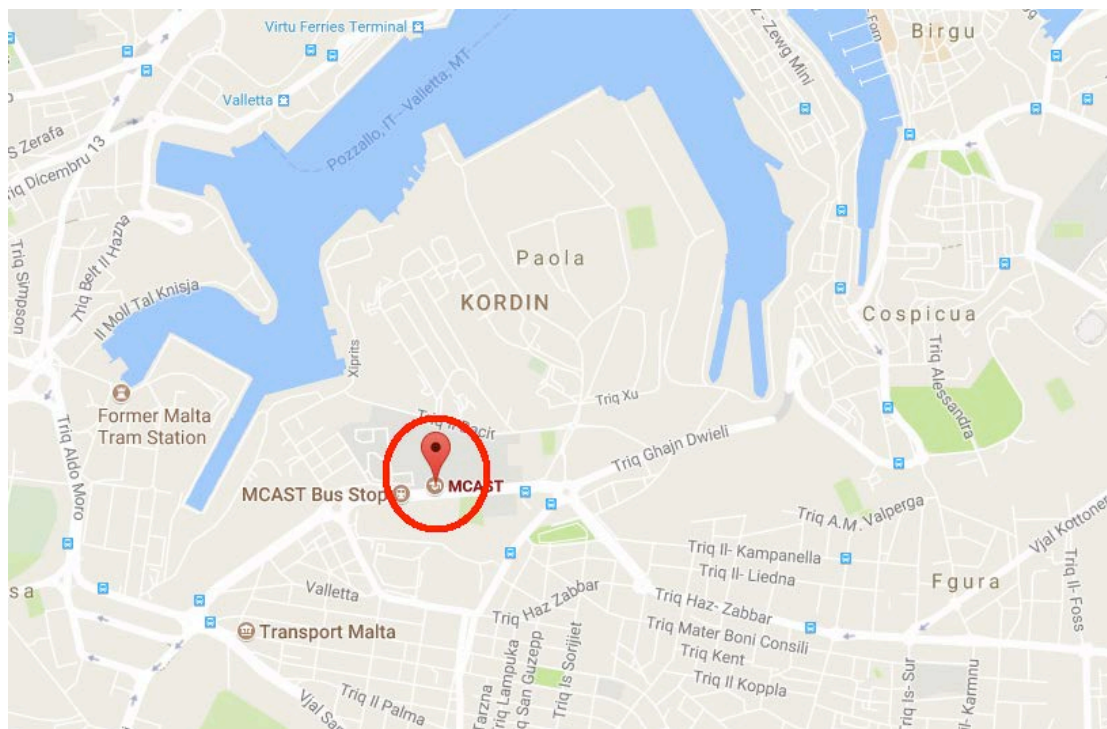
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By bus:

Start	On foot / bus route	End
Malta International Airport	On foot (2 mins)	Airport 3
Airport 3	Bus X3 direction Bugibba (8 stops, 14 mins), or bus X2 direction San Giljan (8 stops, 14 mins).	Lourdes Bus Stop
Lourdes Bus Stop	On foot (5 mins)	MCAST Main Campus

LIST OF SPEAKERS AND LECTURERS

Name	Surname	Organization
Dr Philippe	Ker Rault	Wageningen University
Alberto	Asquer	London University
Leonardo	Piccinetti	Europe for Business Ltd.
Carmen	Muñoz	Europe for Business Ltd.
Ulises	Miranda	Europe for Business Ltd.
Lucila	Candela	Technical University of Catalonia
Malcolm	Borg	Malta College of Arts, Science & Technology
Marco	Dimech	Ministry for Sustainable Development, the Environment and Climate Change – Agriculture Directorate
Jesus	Chazarra	General Directorate of Water. Region of Murcia
Antonio	Ruiz Canales	Miguel hernández University of Elche
Gustavo	Perez	Coordinator of 5TOI Project
Paolo	Nouvion	Id consulting
Daniela	D'Agostino	CIHEAM-IAMB
Davide	Meinero	Id Consulting
Steve	Hallett	Crandfield University

Christian	Camilleri	MCAST
Steve	Zerafa	MCAST

SUMMER SCHOOL AGENDA

Day 1: July 2nd 2018

Venue: Room 205 at the Institute of Applied Sciences within the Malta College for Arts, Science & Technology, Corradino Hill, Paola, Malta.

08:30 – 09:00 Registration & Coffee

09:00 – 09:30 **Welcome – Introduction** (Module I)

Objective: Introduction to the agricultural sector in Malta, its strategic priorities and sustainable development.

Speaker: Marco Dimech, Manager at the Rural Development Department – Agriculture Directorate (Santa Venera, Malta)

09:30 – 10:00 **Welcome and presentation on the FOWARIM project, its results and outcomes** (Module I)

Objective: Overview of the Horizon 2020 project, and its general achievements.

Speaker: Malcolm Borg, FOWARIM project Manager and Deputy Director at the Institute of Applied Sciences – Centre for Agriculture, Aquatics and Animal Science at Malta College of Arts, Science & Technology (Qormi, Malta)

10:00 – 10:20 **2nd Summer School opening – why Circular Economy?** (Module I)

Objective: Present this as a new solution offered by the Economic sector to solve environmental and economic problems of countries, aiming to reduce both the entry of materials and the production of virgin waste, closing the "loops" or economic and ecological flows of resources.

Speaker: Leonardo Piccinetti, Managing Director of Europe for Business Ltd. (London, United Kingdom)

10:20 – 11:10 **A City-Scale Lens for Circular Economy, the case of Peterborough, UK**

Objective: Present the case of the city of Peterborough, United Kingdom, which seeks to become fully circular by 2050. A digital visual tool will be introduced, which presents both the benefits of achieving circularity, and the consequences of the current linear model

Speaker: Steve Hallett (Cranfield University)

11:10 – 11:30 Coffee Break

11:30 – 12:15 **Digitalization of agriculture: the approach of the European Commission to the digital revolution**

Objective: *The initiatives of the EU commission provide many new opportunities for agriculture, food value chains - on land and at sea - and society at large. The innovative approach brought about by the digital single market contributes to making agriculture smarter, more efficient, more circular and more connected.*

Speaker: *Davide Meinero (id consulting)*

12:15 – 13:00 **Sharing knowledge on the leading communication tools for scientific projects**

Objective: *The activities of communication in science can serve multiple purposes. In order to show some of the specific activities that can be carried out when communicating science, a series of examples will be listed and discussed with the class with an overview of the results that can be achieved by communicating science correctly. Finally, a practical exercise will help the students understand that many communication activities can be successfully carried out on their own.*

Speaker: *Paolo Nouvion (ID consulting, Belgium)*

13:00 – 14:00 Lunch Break

14:00 – 14:45 **Stakeholders engagement for inclusive water governance**

Objective: Explain the role of polycentric governance in the management of water resources, with specific attention to the strategies and policies that effectively engage stakeholders to participate in water governance.

Speaker: *Alberto Asquer (University of London, United Kingdom)*

14:45 – 15:30 **Reduction of the carbon footprint through the use of photovoltaic energy in the modernization of irrigation, case study of a semi-arid area of Southeast Spain**

Objective: To analyse the use of photovoltaic energy in a case study for the supply of water for irrigation from different sources in a water user's association for a semi-arid zone in the Southeast of Spain.

Speaker: *Jesús Chazarra (University of Murcia, Spain).*

15:30 **FOWARIM Summer School end of the 1st day**

Day 2: July 3rd 2018

Venue: Room 205 at the Institute of Applied Sciences within the Malta College for Arts, Science & Technology, Corradino Hill, Paola, Malta.

09:00 – 9:30 **How can the FOWARIM project be supported through e-learning platform?**
(Module III)

Objective: Introduce to the participants the e-learning course developed under the FOWARIM project. Give an overview of 4 modules related to water management and research.

Speaker: *Ulises Miranda, Project support and IT Developer for FOWARIM eTraining area.*

9:30 – 10:15 **Problems of water use in the Mediterranean Region**

Objective: The results of an experimental application to support groundwater planning and management in the Apulia Region (Southern Italy) will be presented. The case study will show how the use of Bayesian Belief Networks integrated with hydrological system properties allows to elaborate and analyse scenarios concerning the pressure on groundwater due to exploitation for irrigation and the effectiveness of protection policies.

Speaker: *Daniela D'Agostino (CHIEAM-IAMB, Bari)*

10:15 – 10:45 **Young farmers: Intergenerational knowledge transfer, the circular economy and IT is the sustainability of our fields. Case study.**

Objective: The Circular Economy in agriculture will be explained from a practical point of view, with experiences and good practices. In addition, the importance of innovation in agriculture will be highlighted, without forgetting the role of the predecessors in the sustainable management of agriculture.

Speaker: *Carmen Muñoz (Manager of Europe for Business Ltd., United Kingdom)*

10:45 – 11:30 *Coffee Break*

11:30 – 16:30 **Visit to Ghajn: The National Water Conservation Awareness Centre**

16:00 **FOWARIM Summer School end of the 2nd day session**

Day 3: July 4th 2018

Venue: Room 205 at the Institute of Applied Sciences within the Malta College for Arts, Science & Technology, Corradino Hill, Paola, Malta.

09:00 – 12:30 **3 Solutions to the issues of water use in the Mediterranean Region**

09:00 – 10:00 **Water in the Mediterranean region: an approach to some strategic solutions**

Objective: The aim of this contribution is to present a snapshot, at an appraisal level of detail, on some different Spanish-Mediterranean experiences to reduce the gap between existing supplies and demands. Specifically, IWRM at the Majorca Island and the SE peninsular region will be shown.

Speaker: *Lucila Candela (Technical University of Catalonia, Spain)*

10:00 – 10:45 **Solution of the issues with reclaimed water use: benefits and barriers to reuse treated wastewater for irrigation**

Objective: To give participants adequate knowledge on the correct way to develop reclaimed water – agriculture projects: anticipating challenges, preparing the future. Reuse of treated waste water for irrigation is the most promising solutions to address water crises in the Mediterranean region but this unconventional water resource has advantages and disadvantages that must be understood.

Irrigation with treated waste water is a complex problem because it brings together challenges of a different nature: technical, agronomic, economic, cultural, political, legal, institutional and many more.

The course is organised around 4 presentations of 10 minutes each and 5 minutes discussion on concrete example and on-going applied research.

- Case study of WaWaRIA project: WASTE WATER Reuse for Irrigation in Arid region – case study of desert horticulture with Treated waste water.
- Wastewater Reuse for Irrigation – unconventional or un-welcome resource? Local perceptions on barriers and drivers for reuse in Morocco and Tunisia.
- Challenges with current state of legislation over treated Wastewater quality issues for irrigation.
- Update on current discussion on EC standards on Water reuse.

Speaker: *Philippe Ker Rault (Wageningen University)*

10:45 – 11:30 *Coffee Break*

11:30 – 12:30 **3rd solution: Use of zenital photography combined with low cost soil moisture sensors for crop monitoring in lettucesome initial results**

Objective: Some initial experimental data will be presented in this communication. The use of this combined methodology can be extended for crop monitoring in horticultural crops.

Speaker: Antonio Ruiz (Miguel Hernández University of Elche, Spain).

12:30 – 13:30 **Setting up of a local research cooperation network focusing on Water and Agriculture**

Objective: Launch a local cooperation network which aims to foster collaboration and knowledge exchange both with those engaged in primary production and the supporting agro-industry, and also with those engaged in policy, development and implementation of national and international regulation. It is envisioned that this network will be composed of stakeholders from the agri-food industry on the island, local NGOs, government agencies and those with shared interests in understanding the impacts of agricultural production on water resources, land use and environmental sustainability.

Speaker: Christian Camilleri and Malcolm Borg (MCAST).

13:30 – 14:30 *Lunch Break*

14:30 – 15:30 **Using Satellite Imagery to estimate irrigated water usage**

Objective: Using satellite imagery in agriculture could lead to efficient methodologies which monitor land use and map crops which are being harvested in any location, thus contributing to more sustainable agriculture practices. Such satellite imagery today, is freely available on a weekly basis, with better spatial and temporal resolution, such as that of Sentinel 2. Having such data at hand can naturally lead to the development of water auditing tools in the agriculture, where by irrigation estimations, statistics and patterns could be worked out at local and national scale, leading to better efficiency, planning and control of the demand and supply chain in the agricultural market. These tools could be highly beneficial in dry regions such as the Mediterranean and in areas where both land and water are scarce.

Speaker: Steve Zerafa (MCAST, Malta)

15:30 **FOWARIM Summer School end of the 3rd day session**

Day 4: July 5th 2018

Venue: Room 205 at the Institute of Applied Sciences within the Malta College for Arts, Science & Technology, Corradino Hill, Paola, Malta.

09:00 – 10:00 **What is it the business model?**

Objective: Practical presentation where the main keys to develop business models will be detailed and which will include the methodology that is applied prior to the business plan and allows, in a very simple, visual and intuitive, to develop the most relevant concepts of the project while detecting the strengths and weaknesses of the same.

Speaker: *Leonardo Piccinetti, Managing Director of Europe for Business Ltd. (London, United Kingdom)*

10:00 – 11:00 **Business Model for Water Reuse**

Objective: 5TOI_4EWAS as a conclusion of a long-term regional strategy for cooperation in the MPC area started in 2009.

Speaker: *Gustavo Perez, Project Manager. Universitat Autònoma de Barcelona, UAB (Barcelona, Spain).*

11:00 – 11:30 *Coffee Break*

11:30 – 13:00 **Introduction to European Union funding for research and innovation and education in water and agriculture sectors (Module III)**

Objective: Get familiar with the European Union funding schemes for research and innovation projects for young researchers.

Speaker: *Leonardo Piccinetti, Managing Director of Europe for Business Ltd. (London, United Kingdom)*

13:00 **FOWARIM Summer School end of the 4th day session**

Day 5: July 6th 2018

Venue: Room 205 at the Institute of Applied Sciences within the Malta College for Arts, Science & Technology, Corradino Hill, Paola, Malta.

9:30 – 12:30 **Study Visit: Pembroke Reverse Osmosis plant**

The students will visit to the Pembroke Reverse Osmosis Plant, managed by Water Services Corporation (WSC).

Malta's three RO plants (Pembroke, Cirkewwa and Ghar Lapsi) produce 57% of Malta's total potable water, with the Pembroke plant producing half of the total RO amount.

The Pembroke RO plant itself consists of Plant A and a newer Plant B, with each plant having six trains each. The total capacity of both plants is 54,000 cubic meters of water a day.

For the modernisation of Pembroke Reverse Osmosis Plant, WSC placed great value on the reduction of water costs, which was to be achieved by savings on energy and maintenance costs as well as putting top priority on the long durability of the pumps and energy recovery devices.

13.00 **FOWARIM Summer School end of the 5th day session**