**Document edited by the Technical Scientific Committee of Focus Acqua**

- Raffaella Zucaro (Irrigation Consortium for the Emilia Romagna Canal)
- Stefano Anconelli (Irrigation Consortium for the Emilia Romagna Canal)
- Francesco Cavazza (Irrigation Consortium for the Emilia Romagna Canal)
- Francesco Vincenzi (ANBI - ER)
- Marianna Ferrigno (CREA)
- Sarah Magrini (COLDIRETTI - ER)
- Fulvio Orsini (CIA - ER)
- Guido Zama (CONFAGRICOLTURA - ER)
- Federico Bonatti (Piacenza Reclamation and Irrigation Consortium)
- Jacopo Lauri (Parma Reclamation and Irrigation Consortium)
- Domenico Turazza (Central Emilia Reclamation and Irrigation Consortium)
- Elena Fanti (Burana Reclamation and Irrigation Consortium)
- Lorenzo Cavallina (Renana Reclamation and Irrigation Consortium)
- Andrea Fabbri (Western Romagna Reclamation and Irrigation Consortium)
- Sara Brighi (Romagna Reclamation and Irrigation Consortium)
- Aldo Bignami (Ferrara Plains Reclamation and Irrigation Consortium)
- Giovanni Campagna (COPROB)
- Camporesi Luciano (OROGEL)
- Cristina Fabbroni (JINGOLD)
- Monica Guizzardi (APO CONERPO)
- Claudio Lucchi (APOFRUIT)
- Adriano Zanella (Consorzio di tutela del Riso del Delta del Po IGP)
- Silvia Buzzi (CAVIRO)
- Mattia Tampieri (COPAGRI)


# Policy Brief, Solutions and needs of the irrigation water supply chain

Programma di Sviluppo Rurale dell'Emilia-Romagna 2014-2020
UNIONE EUROPEA
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"Progetto Acqua Campus – Domanda di sostegno 5535532"

## Introduction

Focus ACQUA was born on 8 November 2023 as a permanent forum open to all stakeholders in the agricultural water supply chain. The objective of this newborn community is to identify and disseminate the main innovations for productivity and sustainability in agriculture.

The launch of Focus ACQUA represents a significant step for the irrigation sector on the path to addressing the growing challenges posed by climate change, in a constantly evolving context characterized by extreme events and unpredictable variations.

The entire project was made possible thanks to the founding obtained from the Emilia-Romagna Region through the PSR 2014-2020 call, measure 1.2.01 – Acqua Campus Project.

This document is the result of the discussion of the Scientific Technical Committee (CTS) of Focus ACQUA and collects the requests of the stakeholders of the water supply chain in agriculture, summarizing the research needs and the most promising innovations for the sector.


## 1) Increase water retention in soils through organic matter

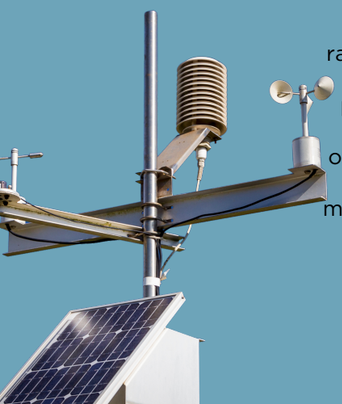
Thanks to its ability to absorb water and the high ease with which it transfers it to crops, organic matter represents one of the best allies for increasing water retention in and water stresses during the irrigation season.

In addition, it allows to create a more hospitable environment for roots, to make crop's nutrients more bio-available, to host the biome useful for promoting plant metabolism and avoiding soil tiredness. Therefore, it presents direct economic benefits on production and allows us to increase the resilience of the agricultural system to climate change.

## 2) Establish an agro-environmental monitoring network

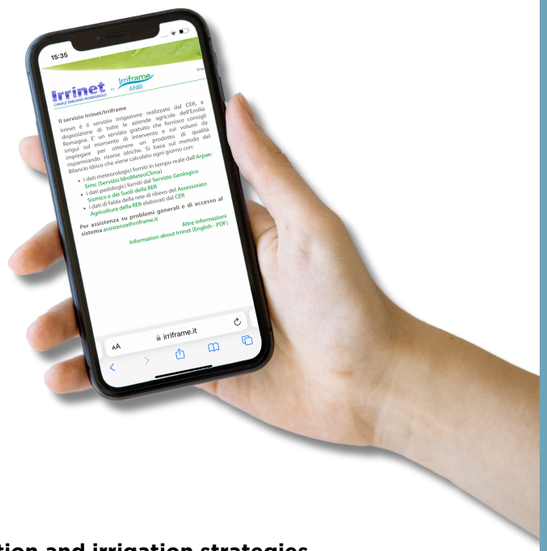
The monitoring and collection of meteorological and physiological data on crops provide farmers and researchers with the necessary database to correlate agronomic choices and climate with agricultural production and the related environmental and economic sustainability. Now, however, data sources are often not harmonized with each other and accessible in different databases.

To allow optimal analytical processes and support the agricultural sector, it is necessary to build a monitoring network to study the interaction between meteorological parameters (temperature, radiation, humidity, wind, frost, heat stroke) and plant physiology (irrigation needs, potential transpiration, longevity of crops) and consequently highlight the impact on production. Alongside eco-physiological and agronomic data, environmental monitoring activities on water resources are increasingly useful, addressing the issue both from the point of view of the quality and quantity of the resource available in surface water bodies (lakes and rivers) and sub-surface water bodies.



## 3) Encourage investments in multifunctional irrigation infrastructures

The sustainable irrigation system is a multipurpose system: anti-frost, climate-conditioning, nutrition, maintenance of organic substance, etc. Complementary technologies (e.g. fertigation stations, control units for anti-frost automation) have a positive impact on improving efficiency. Adapting systems to anti-frost, air conditioning and nutrition functions (with positive environmental and economic impacts) is an essential element to achieve levels of competitiveness capable of guaranteeing the economic sustainability of agricultural businesses. To support the transition towards competitive agricultural systems it is necessary to support the modernization of irrigation systems with multifunctional systems.




## 4) Identify new cultivation and irrigation strategies

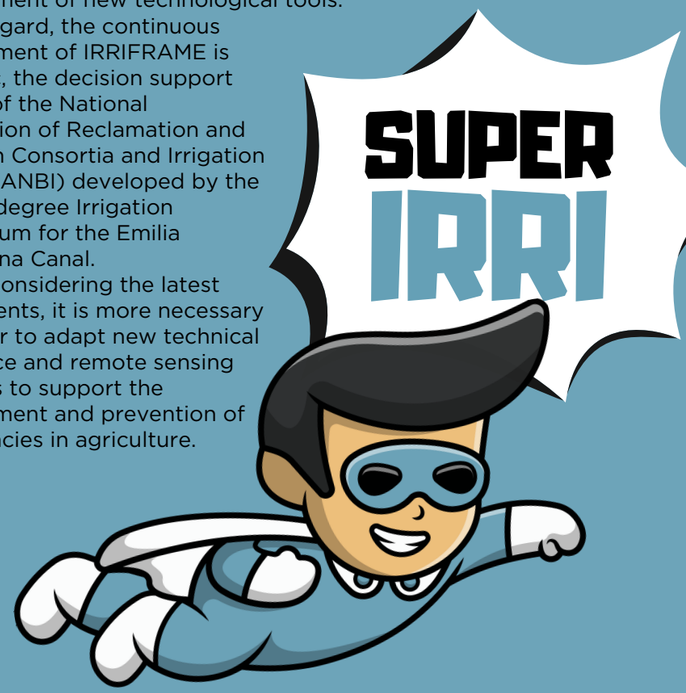
The new climatic and market conditions require supporting farmers in choosing crops and irrigating them. Identifying new crops and new cultivation systems for crops already present and typical of the region can become fundamental for maintaining supply chains and creating new income opportunities. Research on the topic will therefore have to evaluate the impact of irrigation and fertigation practices and conduct a sustainability analysis for each hypothesized supply chain. We also highlight the need to tackle those crops whose irrigation was limited to emergency use (e.g. chard, sorghum, sunflower) which today require increasingly frequent irrigation interventions to allow their productivity.


## 5) Encourage the development of new technologies/update existing ones

In addition to requiring the identification of new approaches to traditional food supply chains (see previous point), the changed climate landscape requires a wider adoption of precision irrigation than ever before. In the application of sensors and decision support systems in general, it is necessary to continuously update the irrigation intervention thresholds for each traditional or innovative technical cultivation path, also through the development of new technological tools.

In this regard, the continuous development of IRRIFRAME is strategic, the decision support system of the National Association of Reclamation and Irrigation Consortia and Irrigation Waters (ANBI) developed by the Second degree Irrigation Consortium for the Emilia Rogmagna Canal.

Finally, considering the latest flood events, it is more necessary than ever to adapt new technical assistance and remote sensing solutions to support the management and prevention of emergencies in agriculture.




## 6) Facilitate the reuse of refined water in agriculture

When appropriately refined, wastewater deriving from agro-industrial and civil plants can constitute a valuable resource, especially in periods of scarcity. From a circular economy perspective, the refined waters also allow a significant saving of the nutrients (nitrogen and phosphorus) with which they are sometimes loaded. The reuse of wastewater, however, requires a collaborative effort on the part of all stakeholders, the competent institutions and authorities to accomplish with regulatory, technical and cognitive gaps that limit the full exploitation of this resource.