Understanding Multifunctionality of Constructed Wetlands in Agricultural Settings in the European Region

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Linking water & agriculture science to policy

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United Nations University
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POLICYBRIEF

No. 01, 2024

Understanding Multifunctionality of Constructed Wetlands in Agricultural Settings in the European Region

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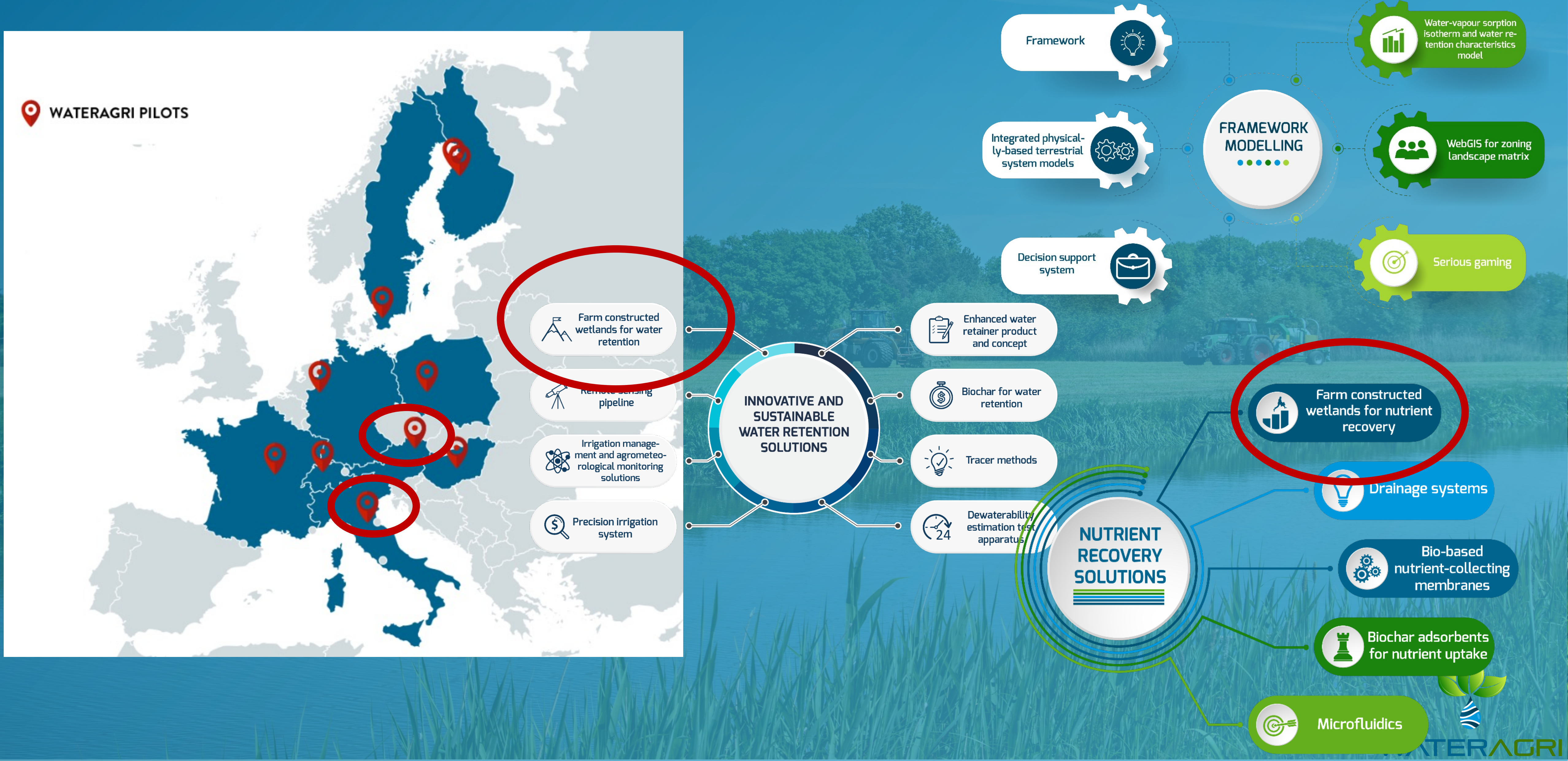
WATERAGRI

WATERAGRI solutions and sites



Maturity of solutions for end-users and usefulness by stakeholder group

Irrigation management system, **Constructed Wetlands, Water Retainer,** biochar, *drainage systems, bio-based membranes, microfluidics*

Const ... retention
chara ... rability test

Constructed wetlands (CWs) were considered to be mature and useful for all three major stakeholder groups: farmers, researchers and advisory services.

Serious game, Constructed Wetlands, biochar, dewaterability test

WATERAGRI

Farm Constructed Wetland in Northern Italy

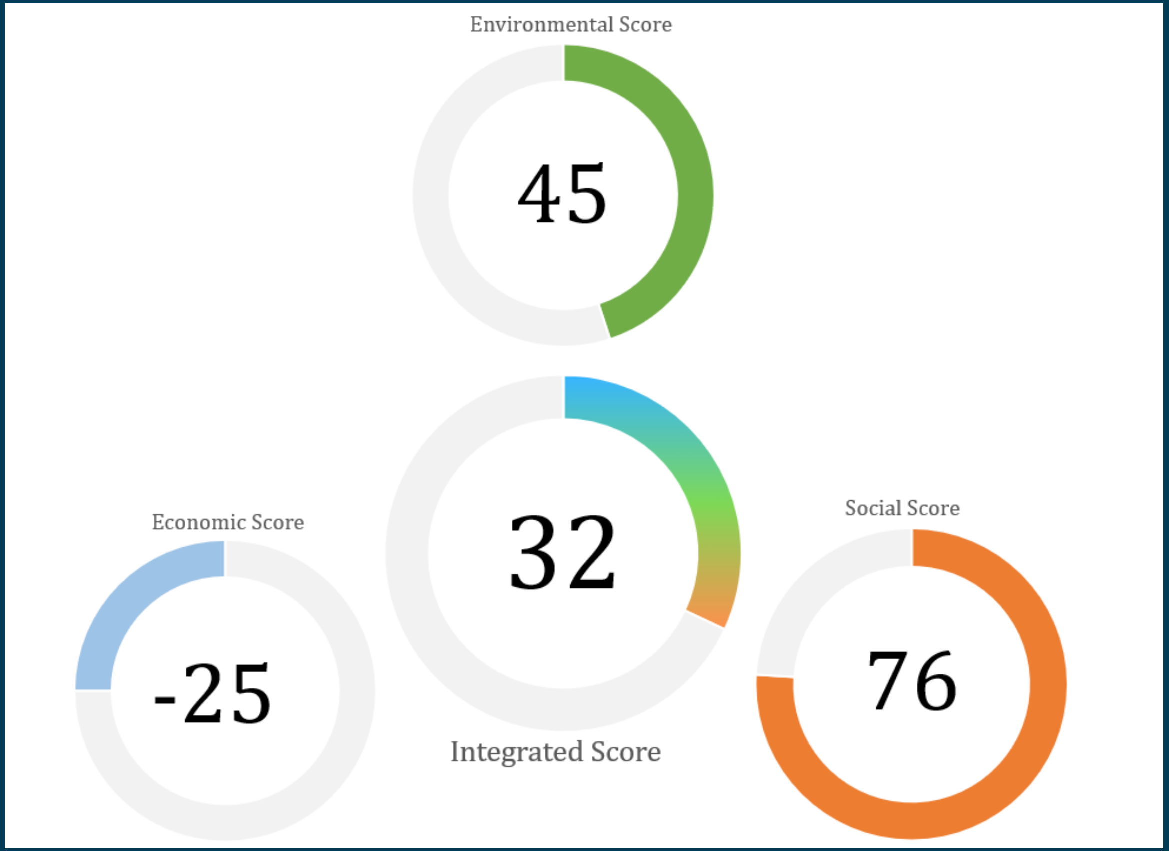
Pros:

- Water treatment and removal of different
- Biodiversity enhancement of an agricultural area
- Improvement of water availability of the area through infiltration
- CW created opportunities for work and training activities for PhD and master students and researchers
- The system can serve as a show-case area for governmental and other institutions that want to apply or support application of such a solution

Cons:

- Application of such a solution requires a certain surface area that means a lower land availability for agricultural production

Sustainability assessment (Life Cycle Thinking)



Sustainability is assessed across three dimensions. Focusing on environmental resource efficiency is not enough.

Understanding more about sustainable implementation of CW for farmers …

Survey (No longer active): https://unibodipsa.eu.qualtrics.com/jfe/form/SV_cu5cXuLc6GleJee

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POLICY BRIEF

No. 5, 2016

Highlights

Risk communication efforts after the Fukushima nuclear disaster face a range of challenges: disparities in access to information and perceptions of risk among the affected people, uncertainties in radiation science and its technical nature, persistent public distrust, and the complexity of the disaster recovery process. This underscores that risk communication in the context of nuclear disasters should be continuous, timely, inclusive and context-sensitive. This policy brief recommends that:

- Risk communication is continuous, preparing for potential crises and using stakeholder discussions and joint monitoring and evaluation of risks related to the nuclear industry.
- Emergency communication mechanisms are established and utilised to ensure timely provision of situation-specific risk information.
- The limits of scientific knowledge and variations in expert views are openly discussed, with public risk perception and concerns in mind.
- Post-disaster radiation risk communication and dialogues on other recovery challenges are integrated in policymaking and implementation.

Introduction

The meltdown of nuclear reactors at the Fukushima Daiichi nuclear power plant in March 2011 following the Great East Japan Earthquake and tsunami led to a large-scale release of radioactive materials, which will require a long process of environmental and societal recovery. Radiological remediation is expected to take longer than the repairing of structural damage caused by the earthquake and tsunami due to the long lifespan of some radioactive substances.

Communicating risks to concerned actors is a crucial element of disaster management governance. Yet post-Fukushima risk communication has been faced with multiple challenges. The majority of the public has found information about radiation to be unfamiliar and highly technical, and difficult to apply to decision-making in their daily lives. Discussing potential health risks also tends to be complicated and contentious. Consequently, describing radiation and radiation risks in an understandable, practical and credible manner is difficult — despite its importance for disaster management, including the protection and recovery of people and their livelihoods.

This underscores the need for risk communication policies and strategies appropriate for the management of nuclear disasters. This policy brief discusses five major

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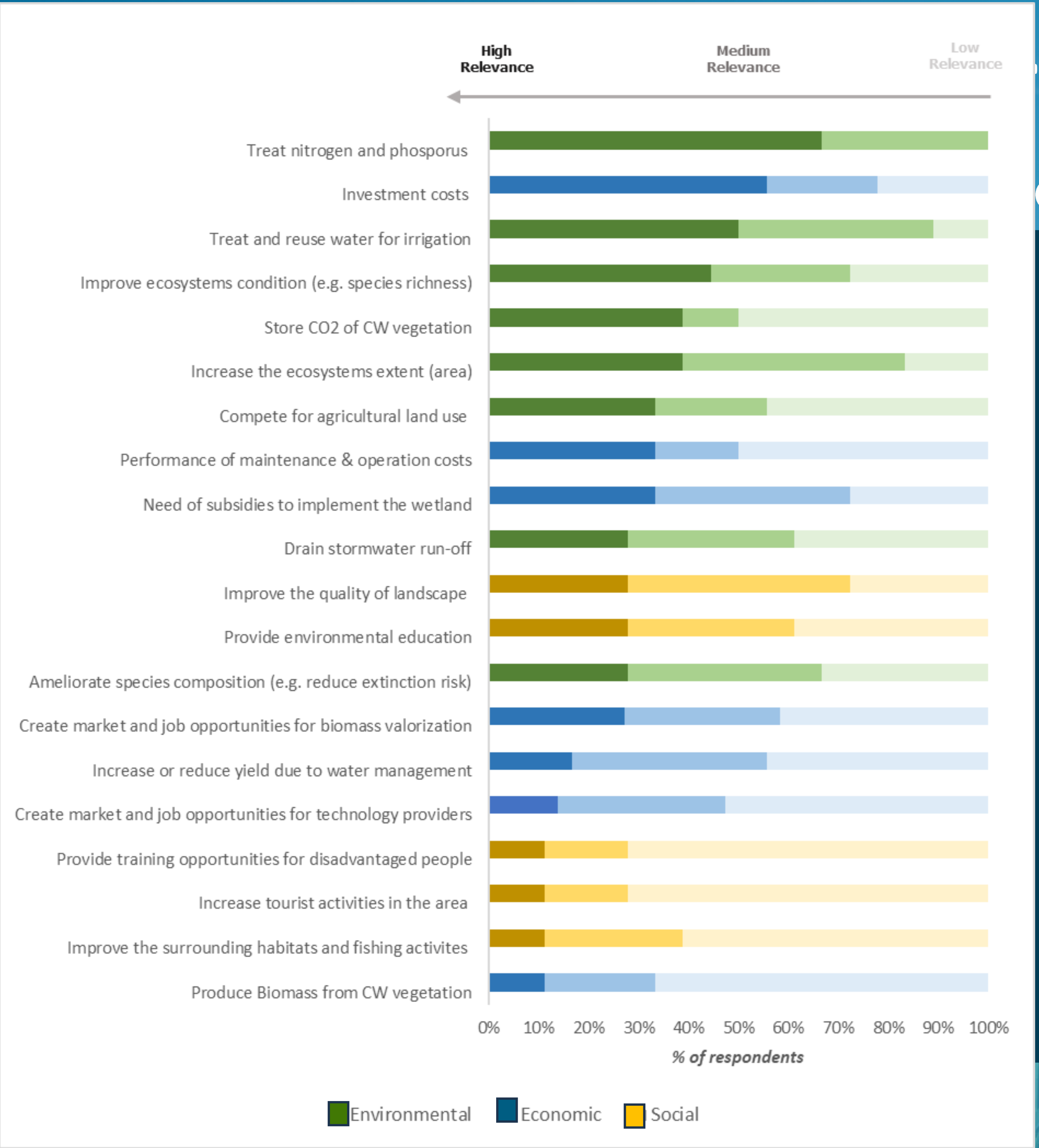

espondents

→ Male, central-european researchers

1. Environmental sustainability is valued as th
2. Nutr rion for w diffe func on or wate
3. Soci to envi ned as unimportant – see environmental education

Technical improvements do not enhance perceptions of elements for social innovation.

Serious games for social innovation

- Serious games have the potential to capture decision complexity and present it through a fun and engaging medium
- AgriLemma was developed in WATERAGRI to increase awareness of sustainable technologies such as constructed wetlands and allows players to experiment with their decisions and gain a better understanding of the performance of the technologies, including farm constructed wetlands, and the trade-offs involved in selecting them

Players compete to maximize the farm's total sustainability score, which is calculated as the sum of environmental, financial and social scores

Take-away messages

Environmental Benefits and Social Innovation: Fostering social innovation is the key to their successful use in farming.

Diverse CW Technologies for Specific Contexts: It is crucial to assess ‘Long-Term Gains’ over immediate ‘Farm-Level Return of Investment (RoI)’ as immediate returns on investment may be challenging to achieve at the farm level, the actual benefits are more likely to be realized at the landscape or catchment levels.

Promoting CW Adoption with Subsidies: Providing financial subsidies to farmers or groups could help establish CW as a promising strategy.

Sustainability-focused approach: A holistic perspective considering environmental, social, and economic dimensions of sustainability remains critical for making well-informed decisions that benefit society (farming community) and not just individuals.

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Recommendations

- Seek support from local authorities for CW implementation.
- Choose CW technologies adapted to farm size, water needs, and environmental conditions.
- Align CW use as a nature-based solution with co-benefits.
- Consider improved water quality, habitat preservation, and trade-offs.
- Understand that ROI may take time; benefits are realized at landscape/catchment levels.

- Encourage collaboration among farmers for collective CW implementation.
- Involve local regulatory and outreach authorities/institutions.
- Shared CWs reduce costs, enhance water quality, and provide ecosystem services.
- Consider a mix of surface and subsurface flow wetlands for varied challenges.

- Advocate for policies supporting financial subsidies for farmers or groups.
- Note that social and environmental benefits outweigh economic costs in many cases.

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