4th Press Release

FrontAg Nexus Delivers Groundbreaking Insights on Frontier Agriculture in the Mediterranean Region through a Systematic Literature Review

Climate change's impact on agriculture sparks innovative solutions

In the face of climate change's profound impact on agricultural activities, especially in vulnerable regions like the Mediterranean, where climatic changes are reducing already limited cultivation resources, the need for innovative and sustainable farming practices has never been more critical. In this context, new resilient and sustainable forms of agriculture incorporating a "circular economy" model should be promoted to help with food security challenges.

Frontier agriculture technologies can contribute to reaching this goal. This press release, explores the findings of Deliverable 1.1 of FrontAg Nexus project, that aimed at establishing which frontier agriculture technologies are practiced in the Mediterranean, their technological readiness level (TRL), business readiness level (BRL), and social readiness level (SRL), costs and benefits, productive capacity, ecosystem services, sectoral policies and key performance indicators (KPIs).

The authors of this comprehensive review include Elisa Appolloni (UNIBO), Giuseppina Pennisi (UNIBO), Vito Aurelio Cerasola (UNIBO), Wubneshe Biru (UniBw M), Gertrud Buchenrieder (UniBw M), Tanay Sıdkı Uyar (EUROSOLAR Türkiye), Yusuf İslam Yavuz (EUROSOLAR Türkiye).

Through a comprehensive Systematic Literature Review (SLR) following the PRIMA approach, the study identifies key technologies that can transform the agricultural landscape and represents an important resource for understanding the current state of the art of frontier agriculture in the Mediterranean.

Smart Agriculture Systems in Focus

Research in Mediterranean countries is actively exploring the application of smart agriculture systems to enhance productivity and nutrition while minimizing environmental impact. Spain and Italy emerged as leaders in the adoption of frontier agriculture technologies, with Egypt taking the lead among African Mediterranean countries.

Cultivation Systems with Multiple Benefits

Evaluated cultivation systems showcase the ability to reuse and optimize resources while generating income. These systems contribute to social inclusion by involving minorities such as women and refugees, ensuring self-household production and creating various ecosystem benefits.

Readiness Levels and Policy Implications

Most of the assessed technologies exhibit TRL, BRL and SRL within the range of 3-5 points, indicating a promising level of maturity. Sectoral policies play a crucial role in shaping the adoption and success of these technologies.

The Systematic Literature Review (SLR) played a crucial role in pinpointing KPIs at micro-level that could offer valuable insights for estimating the impact of the Water-Energy-Food-Ecosystem (WEFE) Nexus within the project's demonstration cases. These identified KPIs encompass:

1. **Inclusive Participation:**
    - Goal: Ensure inclusivity in the project.
    - Target: Engage either **50%** of women or **40%** of individuals facing disadvantages (e.g., refugees, elderly, disabled people) among the total participants in the demonstration case.
2. **Sustainable Water Management:**
    - Goal: Promote responsible water use.
    - Target: Attain **50%** of irrigation water from sustainable or alternative sources or by recycling within the system (e.g., rainwater, saline water, recycled water from aquaponic systems, closed-loop hydroponic systems).
3. **Organic and Recycled Inputs:**
    - Goal: Foster eco-friendly farming practices.
    - Target: Source **50%** of fertilizer or cultivation substrate from organic and recycled resources (e.g., compost, coconut fiber, fish organic wastes).
4. **Renewable Energy Integration:**
    - Goal: Embrace sustainable energy sources.
    - Target: Incorporate **30%** of energy from renewable sources (e.g., solar panels), with a caveat that renewable energy should not contribute to resource depletion, such as extensive water pumping from groundwater resources.

About FrontAg Nexus

Initiated in May 2023, FrontAg Nexus, supported by the EU's PRIMA program, tackles climate change and food insecurity in the Mediterranean. This innovative project employs climate-smart and water-saving technologies like hydroponics, aquaponics, insect farming, vermiculture, and agrophotovoltaic aiming for sustainable food production in areas such as Israel, Italy, and Morocco, Tunisia, Jordan, and Türkiye. Led by Prof. Gertrud Buchenrieder, from UniBw M, it's a leap towards ecological balance, improved living standards, and robust, year-round food sources.

To learn more about the FrontAg Nexus project and stay up to date, visit https://frontagnexus.eu and follow us on social media:

1. Twitter Account
2. Facebook Account
3. LinkedIn Account
4. YouTube Account
5. Instagram Account

Stay tuned as we continue to push the boundaries of sustainable agriculture and foster innovation for a greener, more resilient future.

Disclaimer

This project (GA n° [2242]) is part of the PRIMA programme supported by the European Union.

FrontAg Nexus at a glance

Instrument: PRIMA, the Partnership for Research and Innovation in the Mediterranean Area

Total costs: € 3.206.895,00

Duration: 3 years, 1/5/2023 - 30/4/2026

Consortium: A total of 10 partners from 8 countries (Germany, Greece, Italy, Israel, Jordan, Morocco,Tunisia, Türkiye)

FrontAg Nexus Homepage by PRIMA: https://qap.mel.cgiar.org/projects/1828

Project Coordinator	**Prof. Gertrud Buchenrieder** Universität der Bundeswehr München Email: gertrud.buchenrieder@unibw.de
Project Communication	**Dimitris Fotakidis** Foodscale Hub Greece Email:dimitris@foodscalehub.com