

Beyond Technology: Addressing Social Challenges for Sustainable Frontier Agriculture

Problem/Challenge

Despite the significant environmental and economic promise of frontier agricultural technologies in the Mediterranean, their widespread and equitable adoption faces considerable social hurdles. Varying social acceptance, knowledge gaps, investment concerns among smallholders, and challenges in ensuring fair labour practices threaten to undermine the holistic benefits crucial for the Water-Energy-Food-Ecosystem (WEFE) Nexus.

Our Solution/Key Finding

Findings from the FrontAg Nexus project's systematic literature review and value chain analyses underscore the critical importance of implementing socially responsible practices, ensuring fair labour conditions, promoting gender equality, and actively engaging local communities in the development and deployment of frontier agriculture systems. This integrated approach fosters a just transition that benefits all stakeholders.

Benefits & Impact

Prioritizing social aspects is crucial for unlocking the full potential of frontier agriculture. It leads to increased community acceptance and trust, improved livelihoods for farmers and labourers, and enhanced overall community resilience. By ensuring equitable distribution of benefits and opportunities, these technologies can more effectively contribute to food and nutrition security (FNS) as well as to the Sustainable Development Goals (SDGs), directly aligning with the social environment of the WEFE Nexus.

Practical Recommendations

Farmers and Small and Medium-sized Enterprises (SMEs) should formalize labour contracts, ensure fair wages, and actively support the participation of women in management and

Applicability Box

Theme: Social Sustainability & Equitable Adoption in Frontier Agriculture

Keywords: Social Acceptance, Livelihoods, Gender Equality, Community Engagement, Fair Labor, Human Capital, WEFE Nexus

Context: All scales of agricultural operations, rural development, policy formulation, community-led initiatives.

Required Resources: Commitment from stakeholders, training programs, clear communication strategies, equitable investment models.

Scalability: Social strategies are adaptable to diverse contexts, from local communities to regional policy frameworks.

Readiness Levels: While technologies may be advanced (high TRL), **Social Readiness Level (SRL) often remains moderate (4-6)**, indicating the need for focused social interventions and community engagement [2].

Risk Management/Considerations: Potential resistance to change, ensuring fair benefit distribution to avoid exacerbating inequalities, need for culturally sensitive engagement strategies.

decision-making roles within their operations to build a more inclusive workforce and strengthen local economies. Policymakers are urged to develop and enforce social sustainability guidelines, provide targeted training and capacity building for rural communities, and create platforms for stakeholder engagement to address concerns and build consensus.

References and Further Information

- [1] UM6P, "D1.2: Supply and value chain analysis of climate smart and water saving agri-food production systems," FrontAg Nexus Project Deliverable, Ben Guerir, 2024.
- [2] E. Appolloni, V. Cerasola, G. Pennisi, W. Biru, G. Buchenrieder, T. Uyar and Y. Yavuz, "D1.1: Systematic literature review (SLR) of frontier agriculture systems and empirical evidence in the Mediterranean Region," FrontAg Nexus Project Deliverable, Bologna, 2023.

About this practice abstract

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FrontAg Nexus: The project was launched in May 2023 to promote sustainable agri-food practices by applying the Water-Energy-Food-Ecosystems (WEFE) Nexus approach. Focusing on six Mediterranean countries—Israel, Italy, Morocco, Tunisia, Turkey, and Jordan—the project addresses climate change, resource scarcity, and food insecurity through collaborative research and innovation.

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