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Ruralities

RURALITIES - CLIMATE SMART, ECOSYSTEM-ENHANCING AND KNOWLEDGE-BASED RURAL EXPERTISE AND TRAINING CENTRES

PRACTICE ABSTRACTS – FINAL VERSION

DRAFT

D4.15

WP4 – BEACON: measures to maximize impact, visibility and synergies

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ABSTRACT

The project 'Climate smart, ecosystem-enhancing and knowledge-based rural expertise and training centers' (RURALITIES) delivers an ecosystem-enhancing and climate action driven expertise and learning framework organized in hubs e.g., the 'RURALITIES', comprising a series of innovative methodologies with the learner at its core, supported by a comprehensive network of living labs, and a digital platform combining the internet and wireless technologies, to assist engage, connect and empower actors. This is done via a multi-point approach e.g., multi-actors, multi-disciplines, multi-systems, multi-scale, multi-sectors, and multilevel.

RURALITIES is rooted in the recruitment, preparation, training and coaching of 1.000+ facilitators for a variety of tasks (e.g., trainers, facilitators, role models, hub coordinators, etc.), and who play a significant role in creating the matrix and the platform upon which the learning framework is built, develops, and evolves. RURALITIES proposes to ideate, implement, futureproof, validate and deliver the expertise and learning centers via real-scale practicing in 6 simplified rural socio-ecological systems (SIMSES) e.g., demonstrators, 2 in Italy, 1 in the United- Kingdom (UK), 1 in Slovenia, 1 in Spain and 1 in Romania. RURALITIES coordinates identified actions of local, regional authorities in supports of rural innovation in regions and economic sectors where rural innovators are not yet engaged in a relevant network.

RURALITIES coordinates identified SIMSES networks promoting rural innovation solutions whilst establishing innovative multipoint 'RURALITIES Hubs' of expertise and training on rural innovation. This is done via coordinating action for the managing authorities and regional bodies influencing regional and national policy instruments in Italy, the UK, Slovenia, Spain and in Romania.

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ACRONYMS

Acronym	Description
EC	European Commission
SIMSES	Simplified Socio-ecological Systems
WP	Work Package

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1 INTRODUCTION

1.1 Purpose and Scope

The innovative knowledge, experiences, and practical solutions generated through the RURALITIES project are expected to contribute significantly to the advancement of rural innovation ecosystems across Europe and beyond. A key objective of the project is to ensure that the knowledge developed within the consortium is translated into practical and accessible resources that can be readily adopted by rural stakeholders, practitioners, policymakers, educators, entrepreneurs, and innovation support organisations.

To facilitate effective knowledge transfer, RURALITIES is producing a series of Practice Abstracts that present methodologies, good practices, and innovative approaches in a concise, user-friendly, and action-oriented format. These Practice Abstracts are designed to bridge the gap between research and practice by translating complex project outcomes into practical recommendations and replicable solutions that can be implemented in diverse rural contexts.

The project has committed to producing a total of twenty Practice Abstracts during its lifetime. The present deliverable, D4.15, constitutes the second and final set of ten Practice Abstracts, building upon the first collection published under Deliverable D4.14. Together, these outputs contribute to the wider dissemination, exploitation, and uptake of RURALITIES results, supporting the project's long-term impact and sustainability objectives.

The development of this second set of Practice Abstracts has been informed by the recommendations received during the project review process. In response to the reviewers' observations, the consortium introduced a revised and harmonised template aimed at improving the quality, consistency, and practical relevance of the Practice Abstracts. Compared to the first collection, each Practice Abstract now follows a common structure that:

- Clearly identifies the originating SIMSES and regional context;
- Includes an attractive and informative title;
- Provides a concise description of the challenge addressed and the solution implemented;
- Highlights key results and lessons learned;
- Explicitly outlines the conditions, requirements, and practical steps necessary for replication in other territories;
- Defines the target groups that can benefit from the proposed approach; and
- Emphasises the added value and transferability potential of the presented practice.

This revised approach strengthens the focus on concrete, actionable, and replicable methods, ensuring that the Practice Abstracts serve as practical tools for rural actors seeking to implement similar solutions within their own territories.

In addition, the Practice Abstracts represent an important contribution to the RURALITIES knowledge repository and dissemination framework. Their integration into the RURALITIES website and digital knowledge-sharing infrastructure will be further enhanced during the next phase of the project. This will improve accessibility, visibility, and long-term availability of the generated knowledge, supporting wider uptake among rural communities, innovation actors, and policy stakeholders.

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Although the contractual submission deadline for this deliverable is December 2026, the consortium decided to finalise and submit D4.15 earlier than originally planned. This early submission directly responds to the recommendations provided during the second project review, allowing the consortium to demonstrate how the reviewers' feedback has been incorporated into the revised structure, content, and practical orientation of the Practice Abstracts. It also provides an opportunity to receive further feedback during the subsequent review.

1.2 Document structure

The RURALITIES Practice Abstracts – final version has the following structure:

- **Chapter 1** offer an initial overview of the background within which this report was developed, along with its objectives and organization.
- **Chapter 2** provides 10 practice abstracts developed by project partners.
- **Chapter 3** concludes on the next steps and on the further dissemination of these results.

The document is precisely designed to not only highlight the key content and essential insights of these practices but also to provide a comprehensive overview of their application and relevance. Additionally, to enhance the accessibility, visibility, and usability of the Practice Abstracts, standalone visual summaries of each practice have been developed. These visuals provide an attractive and concise overview of the key elements of each Practice Abstract, supporting the effective communication and promotion of the project results across different dissemination channels. They are also designed to complement the publication of the Practice Abstracts on the RURALITIES website, enabling stakeholders to quickly understand the main features of each practice and facilitating access to the more detailed information provided in the full abstracts. This inclusion serves to complement the main text, offering readers a detailed, in-depth look at the practices in a format that is easy to distribute, share, and refer to.

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2 PRACTICES ABSTRACT 2ND BATCH

The preparation of the second set of RURALITIES Practice Abstracts was coordinated by PEDAL as the lead beneficiary responsible for Deliverable D4.15. The process involved close collaboration with several consortium partners, including all SIMSES partners especially UNIZG, RRAP, CTIC, ASIN, UNIM, RDRP, NIC, GMV, FHV, IISAC and INAG, who contributed examples of innovative practices, methodologies, and solutions developed or identified within their respective territories and activities.

The development process began with a call for contributions across the consortium, focusing on the identification of practices with strong innovation potential, demonstrated applicability, and relevance to rural stakeholders. Attention was given to practices that addressed concrete challenges within rural areas and that demonstrated potential for replication and transferability beyond their original context.

Following the collection of candidate practices, a selection process was undertaken to identify the ten practices to be included in this deliverable. The selection considered several criteria, including relevance to the objectives of the RURALITIES project, innovation potential, practical applicability, evidence of implementation, transferability to other territories, and expected value for rural stakeholders. The resulting portfolio reflects a diverse range of thematic areas, regional contexts, and innovation approaches represented across the RURALITIES ecosystem.

To facilitate the collection, harmonisation, and integration of information, PEDAL developed a dedicated Practice Abstract template. The template was specifically designed to address the recommendations provided during the project review process and to ensure consistency across all contributions. The revised structure requires contributors to clearly describe the originating SIMSES context, the challenge addressed, the proposed solution, achieved results, target groups, and the conditions necessary for successful replication in other territories.

Once the selected practices had been identified, the responsible partners prepared the content using the common template. PEDAL subsequently reviewed, consolidated, and refined all contributions to ensure consistency of style, terminology, and quality across the deliverable. Additional attention was given to strengthening the practical orientation of the abstracts and ensuring that the presented practices are understandable and actionable for a broad audience.

The finalisation phase included a comprehensive editorial and quality review process. Each Practice Abstract was assessed to ensure clarity, coherence, relevance, and alignment with the objectives of Horizon Europe dissemination activities. Emphasis was placed on presenting information in a concise and accessible manner while preserving sufficient detail to support practical implementation and replication.

As a result, the ten Practice Abstracts presented in this deliverable provide stakeholders with practical, field-tested knowledge and actionable recommendations that can support innovation, capacity building, and sustainable rural development across different territorial contexts. The collection contributes directly to the RURALITIES objective of strengthening knowledge transfer and facilitating the uptake of innovative solutions by rural communities, practitioners, advisors, policymakers, and innovation support organisations.

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2.1 Antimicrobial Microparticles for Sustainable Crop Protection and Nutrition (UNIZG)

TERRITORIAL CONTEXT

Country / Region	Croatia / Zagreb region
SIMSES	**SIMSES Follower UNIZG**
Rural context	Rural farming communities face increasing pressure to maintain crop productivity while reducing the use of conventional pesticides and fertilisers. Climate change, soil degradation, rising input costs, and stricter environmental requirements further increase the need for sustainable solutions. Antimicrobial microparticles developed by UNIZG offer an innovative approach to crop protection and nutrition by supporting more targeted and efficient use of active substances. This can contribute to healthier crops, reduced environmental impacts, and more resilient and sustainable agricultural practices in rural areas.

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CHALLENGE

Farmers are increasingly facing challenges related to plant diseases, declining soil health, and the need to reduce the use of synthetic pesticides and mineral fertilizers. At the same time, climate change and environmental regulations require more sustainable and resource-efficient farming practices. There is a need for innovative solutions that can protect crops, improve nutrient availability, and reduce environmental impacts while maintaining agricultural productivity.

SOLUTION

The RURALITIES initiative supports the development of antimicrobial biopolymer microparticles that combine three functions in a single product:

- Protection against plant pathogens.
- Improved plant nutrition.
- Controlled release of bioactive compounds and nutrients.
- The technology uses natural antimicrobial substances such as plant extracts, essential oils, beneficial microorganisms, and bio stimulants. These active ingredients are encapsulated in biodegradable biopolymer carriers, including alginate, chitosan, and gelatine. The microparticles gradually release active compounds in the root zone, ensuring longer-lasting effects and reducing losses caused by leaching, degradation, or excessive application.

HOW THE PRACTICE WAS IMPLEMENTED

The development process includes:

- Selection of suitable natural antimicrobial and bioactive compounds.
- Encapsulation of active ingredients into biodegradable microparticles.
- Optimization of controlled-release properties.
- Laboratory testing of antimicrobial activity and stability.
- Field validation under real agricultural conditions.
- Assessment of economic feasibility and scalability.
- Testing is carried out under controlled laboratory conditions and on experimental agricultural plots.

RESULTS AND OUTCOMES

The practice is expected to deliver the following results and outcomes:

- Reduced dependence on synthetic pesticides and mineral fertilizers.
- Improved crop protection against soil-borne and plant pathogens.
- Enhanced nutrient availability and uptake efficiency.
- Increased crop resilience to abiotic and biotic stress factors.
- Reduced nutrient losses through leaching and volatilization.
- Improved soil health and microbial activity.
- Lower environmental contamination of soil and water resources.
- Increased sustainability and circularity in agricultural production systems.
- Strengthened cooperation between researchers, farmers, SMEs, and local stakeholders.
- Creation of innovative bio-based products with market potential.
- Field and laboratory validation activities will provide measurable indicators related to crop productivity, disease suppression, nutrient-use efficiency, and environmental performance.

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REPLICATION POTENTIAL

The practice can be replicated through the following steps:

1. Identify local crop protection and soil fertility challenges relevant to the region or farming system.
2. Select locally available natural antimicrobial compounds, plant extracts, essential oils, or beneficial microorganisms with proven bioactivity.
3. Choose biodegradable carrier materials suitable for encapsulation and controlled-release applications.
4. Develop or adapt encapsulation protocols based on available laboratory infrastructure and targeted agricultural use.
5. Conduct laboratory testing to evaluate antimicrobial activity, nutrient-release dynamics, and material stability.
6. Perform pilot-scale field trials in collaboration with farmers and agricultural organizations.
7. Monitor crop performance, disease incidence, nutrient efficiency, and environmental impacts.
8. Assess economic viability, farmer acceptance, and opportunities for commercialization or cooperative production.

9. Share results through Living Labs, demonstration farms, training workshops, and regional innovation networks.

Replication is particularly suitable for:

- Agricultural research centres and universities.
- SMEs developing bio-based agricultural inputs.
- Farmer cooperatives and producer organizations.
- Living Labs and rural innovation ecosystems.

RELEVANCE FOR RURAL AREAS

The innovation supports rural resilience by helping farmers reduce input costs, improve resource efficiency, and adopt environmentally friendly production practices. It also creates opportunities for collaboration between researchers, farmers, SMEs, and local authorities, strengthening rural innovation ecosystems and supporting the transition towards sustainable agriculture.

CONDITIONS FOR SUCCESS

Successful implementation of antimicrobial biopolymer microparticles depends on several key factors:

- Availability of suitable biodegradable biopolymer materials such as alginate, chitosan, and gelatine.
- Access to reliable sources of natural antimicrobial compounds, bio stimulants, and beneficial microorganisms.
- Proper optimization of encapsulation techniques to ensure stability and controlled release of active ingredients.
- Collaboration between research institutions, farmers, SMEs, and agricultural advisors during development and testing phases.
- Validation under local agroecological and climatic conditions to ensure effectiveness across different crops and soils.
- Compliance with national and European regulations related to bio stimulants, biofertilizers, and plant protection products.
- Farmer awareness and training regarding sustainable crop protection and nutrient management practices.
- Economic feasibility and scalability of production processes for practical agricultural application.

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ADDED VALUE FOR TARGET GROUPS

Target Group	Added Value
Farmers	Lower production costs through reduced input use. Improved crop yields and crop quality. Increased resilience to climate and disease-related risks. Access to sustainable and environmentally friendly technologies.
Research Institutions and Living Labs	New opportunities for applied research, field validation, and knowledge transfer. Strengthened interdisciplinary cooperation and innovation capacity. Contribution to EU sustainability and Green Deal objectives.
SMEs and Agri-businesses	Opportunities for development of innovative bio-based agricultural products. Potential for commercialization and market expansion in sustainable agriculture sectors.
Rural Communities and Local Authorities	Support for environmentally sustainable rural development. Reduced environmental pressures on local ecosystems and water resources. Promotion of circular bioeconomy approaches and green innovation.
Consumers	Potential reduction of chemical residues in agricultural production. Support for safer and more sustainable food systems.

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TRANSFERABILITY POTENTIAL

The antimicrobial microparticle technology has strong transferability potential because it is based on adaptable, biodegradable, and widely available materials and natural active compounds.

Key transferability strengths include:

- Applicability across different crop types, including vegetables, cereals, orchards, and horticultural systems.
- Compatibility with conventional, integrated, and organic farming systems.
- Adaptability to different climatic, soil, and regional conditions.
- Possibility to incorporate locally sourced plant extracts, microorganisms, and bioactive materials.
- Scalability from laboratory research to pilot and commercial production.
- Alignment with European sustainability, circular economy, and climate adaptation strategies.

The practice can be transferred through:

- Living Lab networks.
- Demonstration farms and pilot projects.
- Farmer training programmes and advisory services.

- Cross-regional cooperation projects.
- Public-private partnerships involving research institutions and SMEs.

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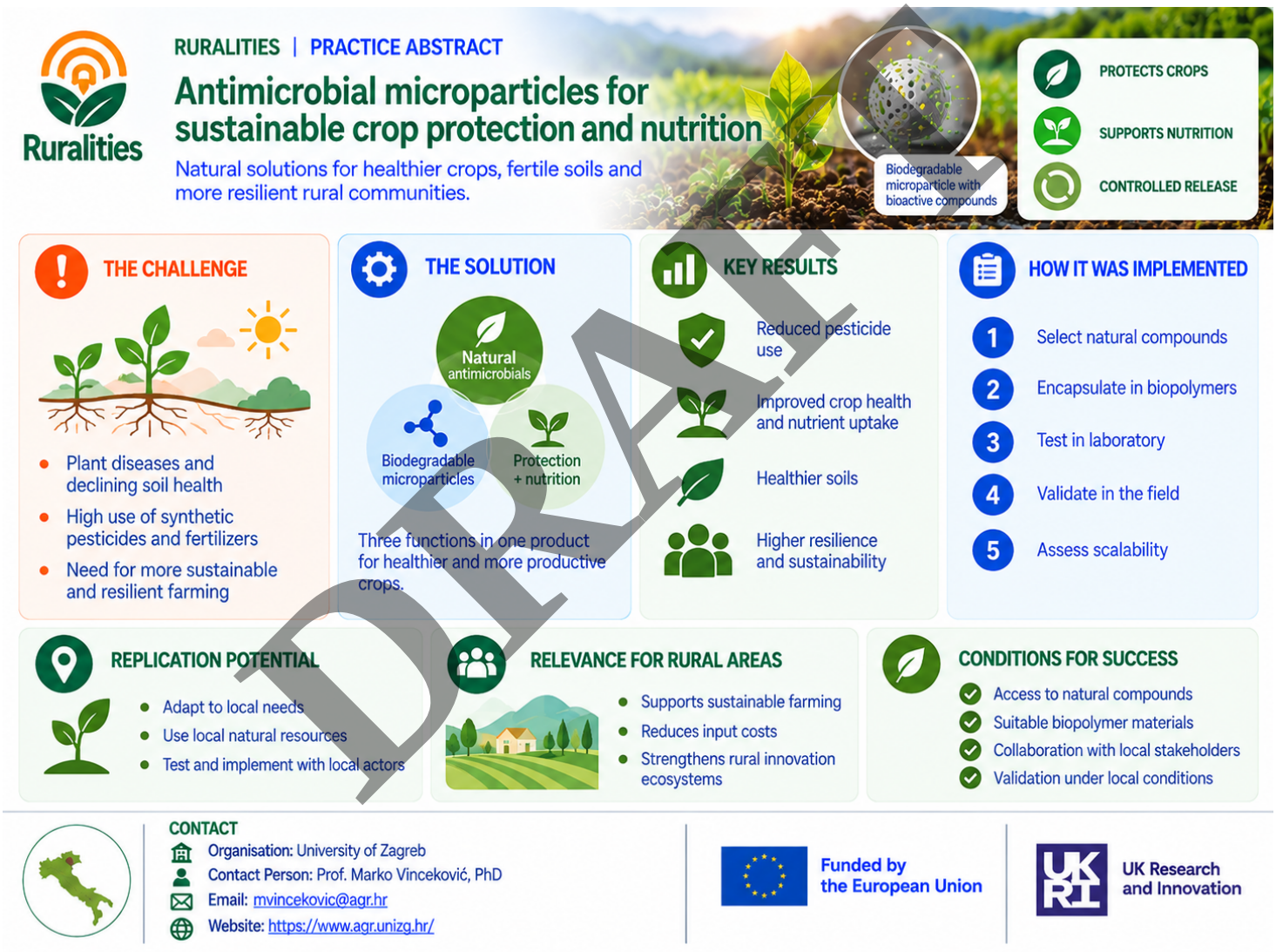


Figure 1 Antimicrobial Microparticles

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2.2 AgroSTEAM: Bringing Digital Innovation and Climate Adaptation Tools to Rural Communities (CTIC)

TERRITORIAL CONTEXT

Country / Region	Spain, Asturias
SIMSES	**SIMSES 5; CTIC**
Rural context	Asturias is characterised by a predominantly rural territory with an important agri-food sector, ageing farming communities and a growing need to improve digital skills among rural stakeholders. Although digital technologies offer significant opportunities to increase productivity, sustainability and resilience, many farmers, SMEs and rural organisations still face barriers related to awareness, training and practical access to innovative solutions. The initiative was implemented in rural areas across Asturias, where agriculture and livestock farming continue to play an important socio-economic role.

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Main Challenges Addressed

- Limited digital skills among rural stakeholders.
- Low awareness of digital technologies applicable to agriculture.
- Need to improve climate adaptation capacities within the agri-food sector.

Organisations Involved

The implementation of AgroSTEAM was led through a collaboration between organisations promoting digital innovation and capacity building in rural areas, while actively engaging the agri-food community as the main beneficiaries of the initiative.

Implementing organisations

- CTIC Centro Tecnológico – Lead organisation responsible for the design and implementation of the technological demonstrations, training activities and knowledge transfer methodology. CTIC provided the technical expertise, digital tools and innovation resources used throughout the initiative.

- Fundación Caja Rural de Asturias – Co-promoter of the initiative, supporting coordination, dissemination and stakeholder engagement, while facilitating connections with the regional agri-food sector and rural communities.

Beneficiaries and participating stakeholders

The activities were addressed to a broad range of rural actors, including:

- Small-scale farmers.
- Livestock producers.
- Agricultural cooperatives.
- Agri-food SMEs.
- Rural entrepreneurs.
- Agricultural advisors.
- Vocational Education and Training (VET) centres.
- Students interested in digital agriculture.
- Rural development organisations.

Their participation ensured that the demonstrated technologies responded to real agricultural needs and facilitated knowledge exchange between technology providers and end users.

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CHALLENGE

Problem Description

Many rural stakeholders are aware that digital technologies can improve agricultural productivity and sustainability, but they often lack practical knowledge of how these technologies can be applied to their own activities.

At the same time, climate change is creating increasing uncertainty for agricultural production, making it essential for farmers and rural organisations to understand new digital tools capable of supporting more informed decision-making.

Why Was This Important?

Without accessible training and practical demonstrations, innovative technologies frequently remain confined to research environments and are not adopted by rural communities.

AgroSTEAM was designed to bridge this gap by providing hands-on learning experiences that make advanced digital technologies understandable and directly relevant to everyday agricultural practice.

Target Groups Affected

- Farmers
- Livestock producers
- Agri-food SMEs
- Rural entrepreneurs
- Students
- Agricultural advisors

PRACTICE DESCRIPTION

Introduction

AgroSTEAM was implemented as a capacity-building and technology transfer initiative aimed at increasing digital literacy and promoting the adoption of innovative technologies within rural communities. The practice combined practical demonstrations, experiential learning activities and stakeholder engagement to bridge the gap between technological innovation and its practical application in the agri-food sector.

The initiative was designed to provide farmers, livestock producers, students, SMEs and other rural stakeholders with direct exposure to emerging digital solutions capable of improving agricultural productivity, supporting climate adaptation and strengthening the resilience of rural territories. By combining practical experimentation with collaborative learning, AgroSTEAM created an environment where participants could understand, test and discuss technologies that are increasingly shaping the future of agriculture.

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Main Activities Implemented

1. Technology Demonstration Events: Technology demonstration events were organised to present innovative digital solutions applicable to the agri-food sector. Participants explored real-life applications of environmental monitoring systems, artificial intelligence, climate simulation tools and data-driven decision-support technologies through live demonstrations delivered by technical experts.

2. Hands-on Digital Skills Workshops: Interactive workshops enabled participants to work directly with digital technologies in practical learning environments. Activities focused on increasing participants' confidence in using digital tools while demonstrating their potential to improve agricultural management, sustainability and climate resilience.

3. Innovation Journeys and Knowledge Exchange Activities: Innovation journeys were organised to connect rural stakeholders with technology providers, researchers and innovation experts. These activities promoted the exchange of experiences, showcased successful digital innovation initiatives and encouraged dialogue on how emerging technologies could respond to local agricultural and environmental challenges.

4. Demonstration of Environmental Monitoring Technologies: Participants were introduced to environmental sensing technologies capable of collecting real-time information on climatic and environmental conditions affecting agricultural production. Demonstrations illustrated how continuous monitoring can improve resource management and support more informed farming decisions.

5. Artificial Intelligence and Data Analytics Demonstrations: The practice included demonstrations of Artificial Intelligence and data analytics tools showing how agricultural data can be processed, interpreted and transformed into actionable information. Participants explored practical examples illustrating the role of AI in supporting crop management, environmental monitoring and operational decision-making.

6. Climate Simulation and Adaptation Exercises: Digital climate simulation tools were used to demonstrate how future climate scenarios may affect agricultural systems. Participants explored different climate projections and discussed adaptation strategies that could improve the resilience and long-term sustainability of farming activities.

7. Stakeholder Networking and Awareness-Raising

The initiative created opportunities for collaboration among farmers, SMEs, educational institutions, public authorities and technology organisations. These networking activities strengthened local innovation ecosystems, encouraged peer learning and facilitated future collaboration in the digital transformation of rural areas.

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Methodology / Approach Used

AgroSTEAM adopted a learning-by-doing and demonstration-based methodology, combining technology transfer, capacity building and stakeholder engagement to facilitate the adoption of digital innovation in rural areas.

Rather than relying on classroom-based theoretical training, the initiative prioritised practical experience through live demonstrations, guided experimentation and collaborative learning activities. Participants interacted directly with digital technologies while discussing real agricultural challenges and identifying potential applications within their own professional contexts.

The methodology also promoted dialogue between researchers, technology developers and rural stakeholders, creating opportunities for mutual learning and ensuring that technological solutions were presented in a practical, accessible and context-specific manner. This participatory approach increased confidence in digital technologies while fostering greater awareness of innovation opportunities for sustainable rural development.

Tools or Resources Used

The implementation of AgroSTEAM combined technological resources with participatory learning methodologies, including:

- Environmental monitoring sensors for collecting real-time agricultural and climate data.

- Digital platforms for visualising and analysing environmental information.
- Artificial Intelligence applications supporting agricultural decision-making.
- Climate simulation tools for assessing future climate scenarios and adaptation options.
- Live technology demonstrations showcasing practical agricultural applications.
- Hands-on workshops allowing participants to experiment directly with digital tools.
- Innovation journeys connecting rural stakeholders with technology providers and research organisations.
- Awareness-raising and networking events promoting knowledge exchange and collaboration.

Timeline

The practice was implemented through a sequence of demonstration events, training workshops and stakeholder engagement activities organised across rural areas of Asturias as part of the AgroSTEAM initiative. Activities were progressively deployed to combine awareness-raising, practical experimentation and knowledge transfer, enabling participants to gradually build digital skills and familiarity with innovative technologies.

Execution: 01/01/2025 – 30/06/2026

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CONDITIONS FOR SUCCESS

Key success factors

The successful implementation of AgroSTEAM relied on a combination of technical expertise, stakeholder engagement and practical learning methodologies. The most relevant enabling factors included:

- Strong collaboration between technology providers and rural stakeholders, ensuring that activities addressed real agricultural needs and challenges.
- A demonstration-based learning approach, allowing participants to interact directly with digital technologies and understand their practical applications.
- Use of technologies with clear relevance to the agri-food sector, including tools supporting digitalisation, environmental monitoring and climate adaptation.
- Active participation of diverse rural actors, encouraging knowledge exchange between farmers, livestock producers, cooperatives, SMEs, students and technical experts.
- Accessible and inclusive training activities, designed to accommodate participants with different levels of digital skills and technological experience.
- Partnership between research and rural development organisations, facilitating both technical excellence and effective outreach within rural communities.

RESOURCES REQUIRED:

Human resources

- Specialists in digital technologies, agriculture and climate adaptation.
- Trainers and facilitators with experience in participatory learning methodologies.

- Technical staff responsible for preparing and operating demonstration equipment.
- Coordination and communication personnel to organise events and engage stakeholders.

Financial resources

- Funding for the acquisition and maintenance of demonstration equipment.
- Organisation of workshops, demonstration events and outreach activities.
- Development of training materials and dissemination resources.

Technical resources

- Environmental monitoring sensors and data acquisition devices.
- Digital platforms for data visualisation and analysis.
- Artificial Intelligence and climate simulation tools.
- Audiovisual equipment and demonstration infrastructure for practical sessions.

Organisational resources

- Collaboration between technology centres and rural development organisations.
- Coordination with local authorities, agricultural cooperatives and sector representatives.
- Suitable venues for demonstrations and practical workshops.
- Communication channels to recruit participants and disseminate results.

Important preconditions

The implementation of this practice requires the existence of a collaborative network capable of bringing together technology providers and rural stakeholders. Local organisations play a key role in mobilising participants, identifying regional priorities and facilitating interaction with the farming community.

It is also essential that the technologies demonstrated are adapted to the characteristics of the local agricultural sector and presented through practical, user-oriented activities that respond to real operational challenges. Ensuring accessibility, relevance and active participation significantly increases stakeholder engagement and supports the uptake of digital innovation.

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REPLICATION GUIDANCE

Replication approach

The AgroSTEAM methodology has been designed to be easily transferable to other rural territories with different agricultural, environmental and socio-economic contexts. Rather than replicating specific technologies, the practice focuses on reproducing a collaborative process that combines technology transfer, capacity building and stakeholder engagement.

Successful replication depends on adapting the demonstrated technologies to local needs while maintaining a practical, demonstration-based learning approach that actively involves rural stakeholders throughout the implementation process.

SUGGESTED STEPS

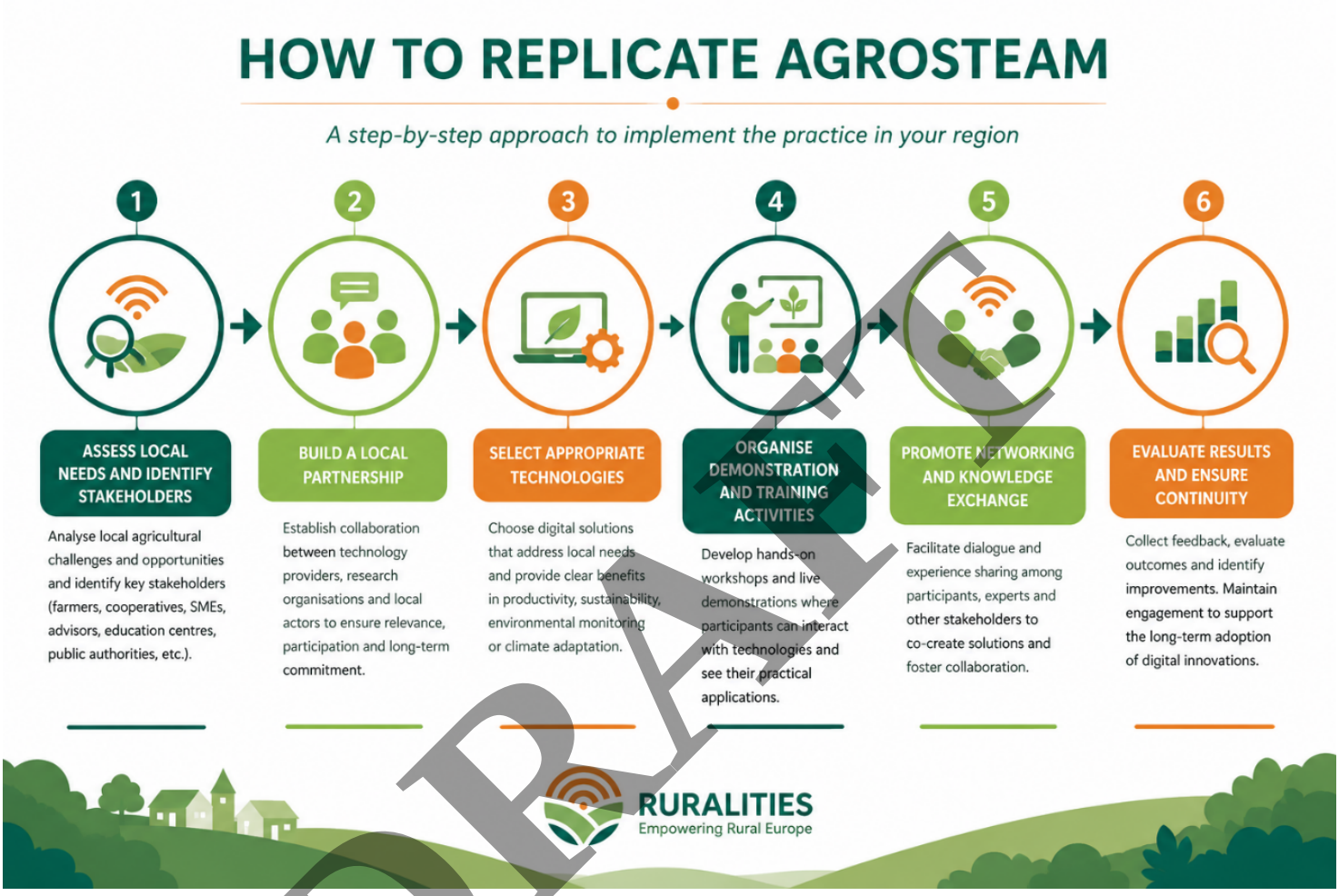


Figure 2 How to replicate AGROSTEAM

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Step 1 – Assess local needs and identify target stakeholders

Analyse the characteristics of the local agri-food sector and identify the main challenges that could benefit from digital technologies. Engage key actors such as farmers, livestock producers, agricultural cooperatives, SMEs, advisory services, educational institutions and public authorities from the beginning of the process.

Step 2 – Build a local partnership

Establish collaboration between technology providers, research organisations and local rural development actors capable of organising activities, mobilising participants and ensuring that the initiative responds to regional priorities.

Step 3 – Select appropriate technologies

Choose digital solutions that address local agricultural challenges and can be demonstrated in a practical and accessible way. Technologies should provide clear benefits for productivity, sustainability, environmental monitoring or climate adaptation.

Step 4 – Organise practical demonstration and training activities

Develop workshops, demonstration events and interactive sessions where participants can directly experience the technologies, test their functionality and discuss potential applications within their own agricultural activities.

Step 5 – Promote networking and knowledge exchange

Facilitate dialogue between technology experts and rural stakeholders, encouraging participants to share experiences, identify common challenges and explore opportunities for collaboration beyond the training activities.

Step 6 – Evaluate results and ensure continuity

Collect feedback, evaluate participant satisfaction and identify opportunities for follow-up actions. Continuous engagement with local stakeholders helps reinforce digital skills and supports the long-term adoption of innovative technologies.

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Lessons Learned

- Practical demonstrations are significantly more effective than traditional classroom-based training for promoting technology adoption.
- Participants engage more actively when technologies are presented as solutions to concrete agricultural challenges rather than as standalone innovations.
- Bringing together different stakeholder groups encourages collaboration and facilitates knowledge exchange across the rural innovation ecosystem.
- Digital literacy activities should be adapted to the varying levels of technological experience of participants.
- Continuous engagement beyond individual workshops helps reinforce learning and increases the likelihood of technology uptake.

Common Risks or Barriers

- Limited availability of farmers and livestock producers during peak agricultural periods.
- Different levels of digital literacy among participants.
- Initial reluctance to adopt unfamiliar technologies.
- Limited awareness of the potential benefits of digital solutions.
- Difficulties in maintaining stakeholder engagement after the completion of demonstration activities.

Suggested Mitigation Measures

- Schedule activities outside peak farming seasons whenever possible.
- Design training sessions using simple language and practical demonstrations rather than technical presentations.

- Present technologies through real-life agricultural use cases that clearly demonstrate their added value.
- Collaborate with trusted local organisations, cooperatives and advisory services to engage participants and increase credibility.
- Establish follow-up communication channels, networking activities or additional workshops to maintain stakeholder engagement and encourage the continued adoption of digital technologies.

RESULTS AND OUTCOMES

During its implementation, AgroSTEAM successfully increased the digital awareness and capacities of rural stakeholders by combining technology demonstrations, collaborative learning and practical training activities. The initiative engaged a wide range of actors from the agri-food sector, providing direct exposure to innovative digital solutions that support climate adaptation, sustainable farming and improved decision-making.

The project also strengthened collaboration between technology providers, agricultural organisations and rural communities, creating a stronger regional innovation ecosystem and promoting the practical adoption of digital technologies in agriculture

Main Results

The implementation of AgroSTEAM delivered several tangible results:

- Increased digital awareness and skills among farmers, agricultural professionals and rural stakeholders.
- Demonstrated nine key digital technologies applicable to agriculture, including Artificial Intelligence, sensors, drones, Geographic Information Systems (GIS), blockchain, robotics, automation and precision agriculture.
- Developed a collaborative co-creation methodology to identify technological needs and priorities within the agri-food sector.
- Established RuralTech as a demonstration space where participants could experience innovative technologies in real conditions.
- Implemented a climate simulation pilot to evaluate crop adaptation strategies under changing climate conditions.
- Strengthened collaboration between research organisations, agricultural cooperatives, advisory services, public authorities and rural development organisations.
- Increased awareness of climate-smart agriculture and the opportunities offered by digital innovation for improving productivity and sustainability.

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Quantitative Indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

Indicator	Results
Implementation period	18 months
Co-creation sessions	1
Innovation workshops (AgroSTEAM Pro)	2
Exploradores del AgroSTEAM sessions	19
Dissemination events for future agri-professionals	4
Pilot climate simulation trials	1
Total organised activities	**27**

** The initiative involved farmers, agricultural cooperatives, agri-food SMEs, advisory services, public authorities, research organisations and rural development actors from different areas of Asturias.*

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Observed Impacts

AgroSTEAM demonstrated that practical, hands-on learning is an effective approach for promoting digital transformation within rural communities. Participants gained a better understanding of innovative technologies and their potential to improve agricultural productivity, environmental sustainability and climate resilience.

The project fostered stronger collaboration between technology developers and end users, enabling knowledge exchange and facilitating the identification of real technological needs within the agricultural sector. The co-creation process ensured that the demonstrated technologies addressed practical challenges faced by farmers and rural businesses.

Furthermore, the climate simulation pilot provided valuable insights into how innovative tools can support adaptation strategies for agricultural production under changing climatic conditions. Together, these activities contributed to building a stronger innovation ecosystem capable of supporting the long-term digital transformation of rural territories.

ADDED VALUE FOR TARGET GROUPS

AgroSTEAM created value for multiple stakeholders within the rural innovation ecosystem by improving access to digital knowledge, facilitating technology transfer and promoting collaboration between research organisations and the agri-food sector.

The practice helped bridge the gap between technological innovation and its practical application, enabling different target groups to better understand how digital solutions can contribute to more resilient, efficient and sustainable rural development.

Target Group	Added Value
Farmers	Improved understanding of digital technologies that support agricultural decision-making, environmental monitoring and climate adaptation. Increased confidence in adopting innovative tools within their farming activities.
Livestock producers	Greater awareness of digital solutions for improving farm management, resource efficiency and environmental sustainability.
Agricultural cooperatives	Enhanced capacity to support their members through increased knowledge of emerging technologies and opportunities for digital innovation.
Agri-food SMEs	Better understanding of digital transformation opportunities, helping improve competitiveness, operational efficiency and innovation capacity.
Agricultural advisors and rural technicians	Access to updated knowledge on digital agriculture, Artificial Intelligence and climate adaptation technologies, strengthening their advisory role within rural communities.
Technology providers and innovation organisations	Opportunity to validate technologies in real rural environments, receive direct feedback from end users and strengthen collaboration with the agri-food sector.
Rural development organisations	New methodologies and practical tools for promoting digital innovation and supporting the sustainable development of rural territories.
Public authorities and policymakers	Better understanding of the challenges and opportunities associated with the digital transformation of agriculture, supporting evidence-based rural development policies.

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Overall Added Value

AgroSTEAM demonstrated that practical, demonstration-based learning is an effective mechanism for accelerating the digital transformation of rural areas. By combining technology transfer, capacity building and stakeholder engagement, the initiative strengthened regional innovation networks and created favourable conditions for the progressive adoption of digital solutions across the agri-food sector.

The practice also reinforced collaboration between research organisations, rural development actors and end users, contributing to a more connected and resilient rural innovation ecosystem that can be replicated in other European territories.

TRANSFERABILITY POTENTIAL

Transferability Level

- High

Easily Replicable Elements

- Practical, hands-on workshops focused on digital technologies for agriculture.
- Technology demonstration events showcasing real use cases and innovative digital solutions.
- Collaboration between technology centres, rural development organisations and agricultural stakeholders.
- Capacity-building activities tailored to the needs of farmers, livestock producers and agri-food SMEs.
- Stakeholder engagement methodologies that encourage knowledge exchange and peer learning.
- Awareness-raising activities promoting digital innovation and climate adaptation in rural communities.

Elements Requiring Adaptation

- Selection of digital technologies according to the characteristics of local agricultural systems.
- Training content adapted to the digital maturity and specific needs of participants.
- Local stakeholder networks and partnerships supporting implementation.
- Event schedules adapted to agricultural calendars and seasonal farming activities.
- Communication strategies adapted to local languages, cultural contexts and regional priorities.

Suitable Types of Territories

- Mountain areas.
- Agricultural regions.
- Remote rural areas.
- Livestock farming regions.
- Areas facing climate adaptation challenges.
- Rural territories undergoing digital transformation.
- Regions seeking to strengthen innovation ecosystems within the agri-food sector.

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REPLICATION BOX

Aspect	Information
Recommended for:	Technology centres, rural development organisations, agricultural cooperatives, innovation hubs, advisory services and public authorities promoting digitalisation in rural areas.
Main objective:	To improve the digital skills of rural stakeholders and accelerate the adoption of innovative technologies that support sustainable, resilient and climate-smart agriculture.
Estimated implementation time:	12–18 months for full implementation, including planning, stakeholder engagement, workshops and evaluation.
Required resources:	Technical experts, training facilities, digital equipment, demonstration technologies, communication materials, project coordination and collaboration with local stakeholders.
Main stakeholders needed:	Farmers, livestock producers, agricultural cooperatives, agri-food SMEs, agricultural advisors, technology centres, rural development organisations and local public authorities.
Main risks:	Limited stakeholder participation, varying levels of digital literacy, scheduling conflicts with agricultural activities, resistance to adopting new technologies and limited long-term funding.
Cost intensity	Medium
Technical complexity	Medium
Stakeholder engagement intensity	High

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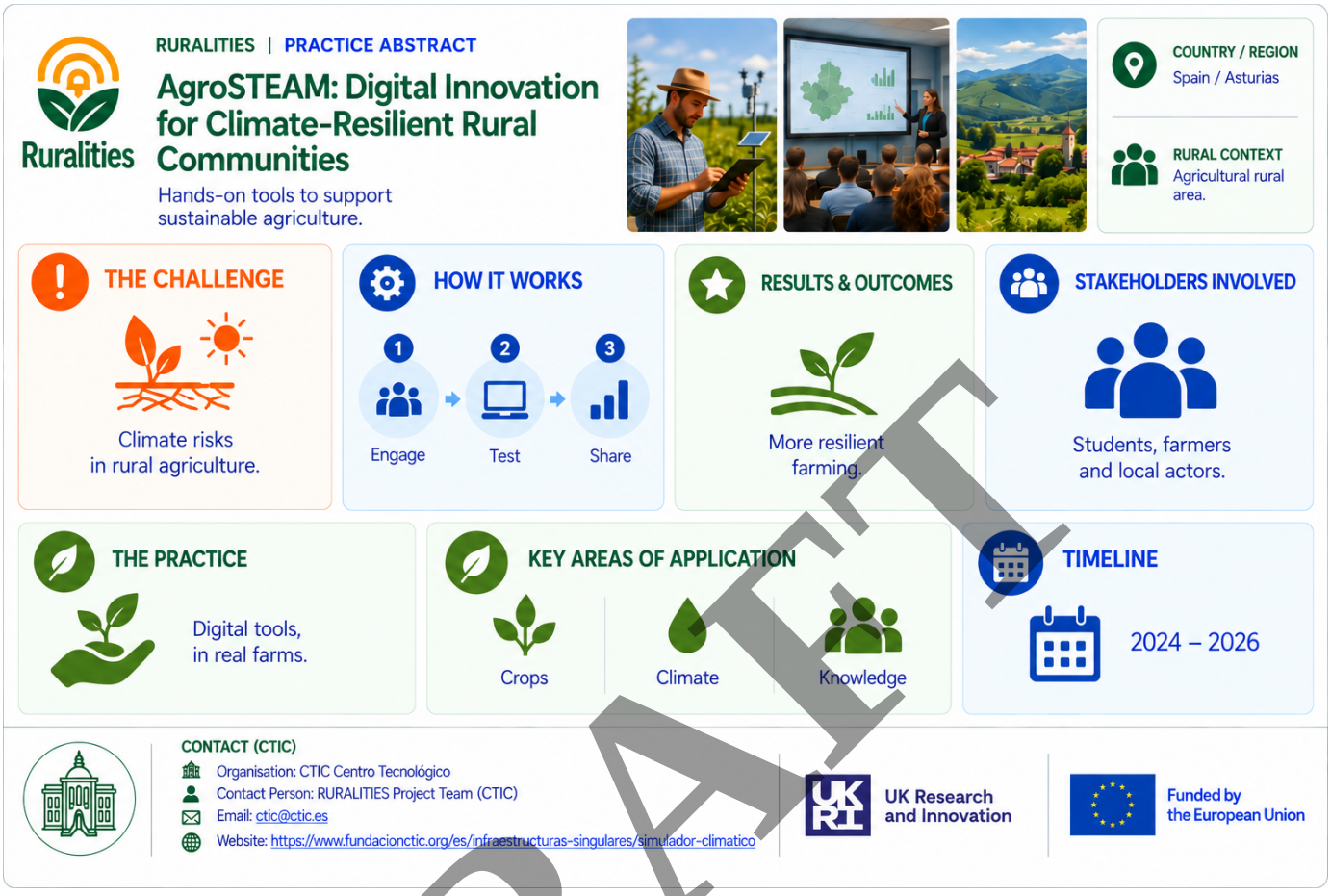


Figure 3 AgroSTEAM: Digital Innovation for Climate-Resilient Rural Communities

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2.3 Climate Simulation as a Living Laboratory for Sustainable Agriculture (CTIC)

TERRITORIAL CONTEXT

Country / Region	Spain, Asturias
SIMSES	**SIMSES 5; CTIC**
Rural context	The practice was implemented in the rural valley of Peón, located in the municipality of Villaviciosa (Asturias, Spain), within CTIC's RuralTech Living Lab. The area is characterised by small-scale agricultural holdings, family farming, livestock production and valuable natural ecosystems. Like many European rural territories, it faces significant challenges related to climate change, ageing farming populations, limited digitalisation, fragmented agricultural production and the need to improve the resilience and sustainability of farming systems. To address these challenges, the Living Lab provides a real-world experimentation environment where digital technologies, environmental monitoring systems and climate adaptation solutions can be tested together with farmers, researchers and other rural stakeholders before being transferred to wider agricultural contexts.

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Main Challenges Addressed

- Increasing climate variability affecting agricultural production.
- Limited access to digital technologies and data-driven decision support.
- Need for more resilient and climate-adapted farming systems.
- Lack of real-world environments for testing and validating innovative agricultural solutions.
- Need to facilitate knowledge transfer between research organisations and rural communities.

Organisations Involved:

- CTIC Technology Centre
- Local farmers and agricultural producers
- Regional stakeholders participating in the RuralTech Living Lab
- Research and innovation partners involved in agricultural digitalisation and climate adaptation initiatives

Implementing organisations

- CTIC Technology Centre

Beneficiaries and participating stakeholders

- Farmers and agricultural cooperatives

- Rural SMEs
- Technology providers
- Researchers
- Public administrations
- Rural communities
- Students and training participants involved in digital agriculture activities

CHALLENGE

Problem Description

Climate change is creating increasingly unpredictable growing conditions for agriculture, with more frequent heatwaves, prolonged droughts, irregular rainfall patterns and the emergence of new pests and diseases. Farmers need reliable information on how crops respond to these changing conditions to adopt effective adaptation strategies.

However, evaluating the impact of future climate scenarios directly in the field is difficult, costly and time-consuming. Traditional field trials depend on natural weather conditions, making it impossible to reproduce identical scenarios or compare adaptation measures under controlled environmental conditions. This limits the speed at which new crop varieties, cultivation techniques and digital decision-support tools can be developed and validated.

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Why Was This Important?

To improve the resilience of rural communities, researchers and farmers need environments where climate conditions can be accurately recreated and experiments repeated under controlled settings. Such facilities enable faster testing of climate adaptation strategies, support the development of innovative digital solutions and reduce the risks associated with transferring new practices directly to commercial farms.

The Climate Simulator addresses this need by providing a controlled experimental environment where different climate scenarios can be reproduced to evaluate crop performance, validate innovative technologies and generate scientific evidence before deployment in real agricultural conditions.

Target Groups Affected

- Farmers and agricultural producers.
- Agricultural researchers and innovation centres.
- Agri-tech companies developing digital farming solutions.
- Plant breeders and crop specialists.
- Public authorities supporting climate adaptation policies.

- Rural communities dependent on sustainable agricultural production.

PRACTISE DESCRIPTION

Introduction

The Climate Simulator at CTIC was developed as a controlled experimentation facility to accelerate agricultural innovation and climate adaptation. Rather than focusing on a single crop or research project, the facility provides a flexible environment where different climate scenarios can be reproduced to evaluate crop performance, validate digital technologies and generate evidence before transferring solutions to real farming conditions.

The simulator combines environmental control, IoT monitoring and data collection, enabling researchers to study the interaction between crops and future climate conditions under repeatable and scientifically controlled experiments.

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Main Activities Implemented

The Climate Simulator has supported several innovation projects addressing different agricultural challenges:

- Climate resilience of traditional crops: Experimental trials with the Fabón de Moal, one of Asturias' traditional bean varieties, evaluated its response to future climate scenarios and compared its behaviour with other bean varieties under controlled temperature and humidity conditions.
- AI-based crop health monitoring (FRESQIA): The simulator was used to recreate environmental conditions affecting strawberry cultivation while collecting image datasets and environmental variables for developing Artificial Intelligence and hybrid Quantum AI models capable of detecting foliar diseases.
- Carbon-smart horticulture: Controlled lettuce cultivation experiments explored how different environmental conditions influence plant growth, resource efficiency and carbon capture potential, supporting future approaches to sustainable production and carbon footprint reduction.
- Climate-driven soil amendment validation for strawberry cultivation: In collaboration with Asturiana de Fresas, historical climate records from the AEMET weather station in Llanes were analysed to identify climatic trends affecting strawberry production. These conditions were then reproduced inside the Climate Simulator to evaluate different soil formulations and amendments under controlled environmental scenarios. The study assessed their influence on plant growth and early crop development before field implementation, reducing uncertainty prior to commercial deployment.
- Technology validation platform: Beyond individual projects, the simulator serves as a testing environment for new sensors, monitoring systems and digital agriculture technologies before their deployment in operational farming environments.

Methodology/Approach Used

The Climate Simulator follows a data-driven experimentation methodology, combining environmental control, continuous monitoring and digital decision support to create a fully managed Smart Greenhouse for agricultural research.

Each experimental campaign starts with the definition of the agronomic challenge and the design of the environmental scenario to be reproduced. Before cultivation begins, the greenhouse is configured and fully instrumented with IoT devices and monitoring equipment to continuously capture environmental and crop-related variables throughout the entire experiment.

At the core of the infrastructure is a centralised digital dashboard that provides real-time supervision of all greenhouse conditions. Researchers can continuously monitor key parameters—including temperature, relative humidity, soil moisture, light intensity, irrigation status and other environmental indicators—through a single interface. The platform also incorporates configurable early-warning alerts, notifying operators whenever predefined thresholds are exceeded or abnormal conditions are detected, ensuring rapid intervention and protecting the integrity of ongoing experiments.

Beyond monitoring, the platform enables remote management of the experimental environment. Researchers can adjust irrigation schedules, activate or deactivate artificial lighting, regulate natural light by controlling automated shading systems, and modify environmental settings without interrupting the experiment. This level of automation guarantees reproducibility between trials while significantly reducing manual intervention.

All environmental data are automatically recorded and integrated with crop observations, images and experimental measurements, creating high-quality datasets suitable for agronomic analysis, Artificial Intelligence applications and digital twin development.

Whenever appropriate, experiments carried out inside the Climate Simulator are complemented with data collected from outdoor sensorised cultivation plots, allowing researchers to compare crop behaviour under controlled and real environmental conditions. This dual approach improves the validation of experimental results and facilitates the transfer of innovative solutions to operational farming systems.

The result is a repeatable experimentation framework where monitoring, control, automation and data analytics operate together to accelerate agricultural innovation and climate adaptation.

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Tools or Resources Used

The implementation combines advanced greenhouse infrastructure, environmental control systems, IoT technologies and digital tools to create a fully managed Smart Greenhouse capable of supporting reproducible agricultural experiments under controlled climate conditions.

Climate-controlled greenhouse infrastructure

- Climate simulation greenhouse designed for controlled agricultural experimentation.
- Automated climate control systems for temperature, relative humidity and ventilation.

- Automated irrigation and fertigation systems.
- Motorised shading systems to regulate natural light availability.
- Artificial lighting systems to simulate different photoperiods and crop development conditions.

IoT monitoring and sensorisation

- Environmental sensors monitoring temperature, relative humidity, light intensity, CO_2 concentration and other climatic variables.
- Soil sensors measuring moisture, temperature and additional agronomic indicators depending on the experiment.
- Continuous monitoring of greenhouse conditions through connected IoT devices.
- Automatic acquisition and storage of environmental and crop-related data throughout the complete cultivation cycle.

Smart Greenhouse Management Platform

- Centralised digital dashboard providing real-time supervision of all greenhouse operations.
- Continuous visualisation of environmental variables and equipment status.
- Remote management of irrigation, lighting, ventilation, environmental settings and automated shading systems.
- Configurable early-warning alerts notifying operators whenever predefined thresholds or abnormal operating conditions are detected.
- Historical data logging for experiment traceability, comparison and performance analysis.

Digital agriculture technologies

- Computer vision and image acquisition systems for crop monitoring.
- Artificial Intelligence and Machine Learning tools for agronomic analysis and predictive modelling.
- Hybrid Quantum AI algorithms developed within the FRESQIA project.
- Data analytics and reporting tools supporting scientific research and technology validation.

Complementary research infrastructure

- Outdoor sensorised agricultural plots for validating experimental results under real farming conditions.
- Environmental monitoring networks collecting comparable field data.
- Integrated data platform combining greenhouse and outdoor observations to support climate adaptation research.

The combination of these resources transforms the Climate Simulator into a digitally managed research infrastructure, where environmental control, continuous monitoring, automation and data analytics operate as a single integrated system. Unlike conventional research greenhouses, every experiment is fully traceable, remotely manageable and continuously monitored, enabling the generation of high-quality datasets that support agricultural research, climate adaptation studies and the development of innovative digital farming solutions.

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Timeline

The implementation of the Climate Simulator followed a progressive evolution from a controlled greenhouse infrastructure to a digitally managed experimentation platform supporting agricultural innovation.

- Infrastructure setup: Development of the climate-controlled greenhouse and installation of environmental control systems.
- Digitalisation: Deployment of IoT sensors, automation technologies and the Smart Greenhouse Management Platform for real-time monitoring and remote control.
- Experimental operation: Launch of research projects focused on climate adaptation, sustainable crop production and technology validation.
- Continuous innovation: Integration of Artificial Intelligence, computer vision and advanced digital technologies, together with the connection to outdoor sensorised cultivation plots for comparative validation.

The infrastructure continues to evolve through new research projects and technology developments, enabling the rapid testing and validation of innovative solutions for climate-resilient agriculture

CONDITIONS FOR SUCCESS

Key success factors

The successful implementation of the Climate Simulator relied on the combination of advanced infrastructure, digital technologies and multidisciplinary collaboration. Rather than operating as a conventional research greenhouse, the facility was conceived as a flexible experimentation platform capable of supporting multiple agricultural challenges and innovation projects.

Several factors have been critical to its success:

- A fully controlled Smart Greenhouse, capable of reproducing different climate scenarios through the automated management of temperature, humidity, irrigation, lighting, ventilation and shading systems.
- Continuous monitoring and digitalisation, supported by IoT sensors, real-time data acquisition and a centralised dashboard providing complete visibility of greenhouse operations.
- Remote operation and automation, allowing researchers to adjust environmental conditions, receive early-warning alerts and guarantee the reproducibility of experimental campaigns.
- A multidisciplinary approach, bringing together agronomists, engineers, data scientists and technology developers to design, execute and analyse experiments.
- Flexibility to support multiple use cases, enabling the same infrastructure to host projects on traditional crop resilience, sustainable horticulture, Artificial Intelligence, computer vision and hybrid Quantum AI.
- Integration with real agricultural environments, combining controlled experimentation with outdoor sensorised cultivation plots to validate results under operational farming conditions.

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- Commitment to knowledge transfer, ensuring that research outcomes can be translated into practical recommendations, digital tools and innovative solutions for farmers, researchers and agri-tech companies.

RESOURCES REQUIRED

Human resources: a multidisciplinary team is essential to design, operate and exploit the Climate Simulator effectively. Typical profiles include:

- Agronomists and crop specialists.
- Greenhouse and irrigation technicians.
- IoT and automation engineers.
- Data scientists and Artificial Intelligence specialists.
- Software developers for digital platform integration.
- Research and project management staff.
- Technology transfer and stakeholder engagement personnel.

Financial resources: the main investment relates to the establishment of the Smart Greenhouse infrastructure and its digitalisation. Financial resources should cover:

- Construction or adaptation of a climate-controlled greenhouse.
- Environmental control and automation systems.
- IoT sensors and communication infrastructure.
- Smart Greenhouse Management Platform.
- Scientific equipment and monitoring technologies.
- Operation, maintenance and calibration of equipment.
- Personnel costs for research, experimentation and technical support.

Although the initial investment may be significant, the infrastructure can support multiple research projects and innovation initiatives over many years, increasing its long-term cost-effectiveness.

Technical resources: the implementation requires an integrated combination of physical and digital technologies, including:

- Climate-controlled greenhouse infrastructure.
- Automated irrigation, ventilation, lighting and shading systems.
- Environmental and soil monitoring sensors.
- IoT communication network.
- Centralised dashboard for monitoring and remote control.
- Early-warning and alarm systems.
- Data storage and analytics platform.
- Computer vision equipment where required.
- Artificial Intelligence and data processing tools.
- Outdoor sensorised agricultural plots (recommended for validation).

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Organisational resources: successful implementation depends on effective collaboration between different stakeholders. Recommended organisational resources include:

- A research or innovation organisation responsible for infrastructure management.
- Collaboration with farmers and agricultural producers.
- Partnerships with universities, technology centres and public authorities.
- Procedures for planning, documenting and evaluating experimental campaigns.
- Data governance practices ensuring data quality, traceability and secure management.
- Mechanisms for transferring research results to end users.

Important preconditions

Several preconditions should be considered before implementing a similar initiative:

- Clearly identified agricultural challenges that justify controlled experimentation.
- Access to suitable greenhouse facilities or the possibility of adapting existing infrastructure.
- Availability of reliable electricity, water supply and internet connectivity.
- Capacity to maintain and calibrate environmental control and monitoring systems.
- Availability of technical staff capable of operating the infrastructure.
- Commitment to long-term operation, as the infrastructure delivers greater value when supporting multiple projects over time.
- Strong collaboration with farmers and other end users to ensure that experimental activities respond to real agricultural needs.

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REPLICATION GUIDANCE

The Climate Simulator can be replicated by organisations wishing to strengthen agricultural innovation and climate adaptation through controlled experimentation. Rather than reproducing an identical infrastructure, replication should focus on establishing a flexible Smart Greenhouse capable of responding to local agricultural priorities and supporting multiple research and innovation activities. A recommended replication pathway includes the following steps:

1. Identify local agricultural challenges

Define the main climate-related or production challenges affecting the territory and prioritise those where controlled experimentation can provide practical value (e.g. drought resilience, heat stress, water efficiency, disease management or sustainable crop production).

2. Design a scalable Smart Greenhouse

Develop a climate-controlled greenhouse that can be progressively expanded. The infrastructure should incorporate environmental control systems, automation and sufficient flexibility to accommodate different crops and experimental configurations.

3. Deploy digital monitoring and automation

Install IoT sensors to continuously monitor environmental and crop conditions. A centralised digital dashboard should enable real-time supervision, remote management of irrigation, lighting, ventilation and shading systems, as well as configurable early-warning alerts.

4. Develop a data-driven experimentation framework

Establish standard procedures for designing experiments, collecting high-quality datasets and documenting results. Data should be stored in a structured manner to facilitate reproducibility, long-term analysis and the future development of Artificial Intelligence applications.

5. Start with pilot projects

Begin with one or two well-defined experimental projects addressing priority local needs. Early demonstrators help validate the infrastructure, generate stakeholder confidence and demonstrate the practical value of controlled experimentation.

6. Connect controlled and real-world environments

Whenever possible, complement greenhouse experiments with outdoor sensorised cultivation plots. Comparing controlled and field conditions improves result validation and increases confidence before transferring new practices to farmers.

7. Promote collaboration and knowledge transfer

Involve farmers, researchers, technology providers and public authorities from the beginning. Regular dissemination activities and demonstration events help ensure that research outcomes are translated into practical agricultural solutions.

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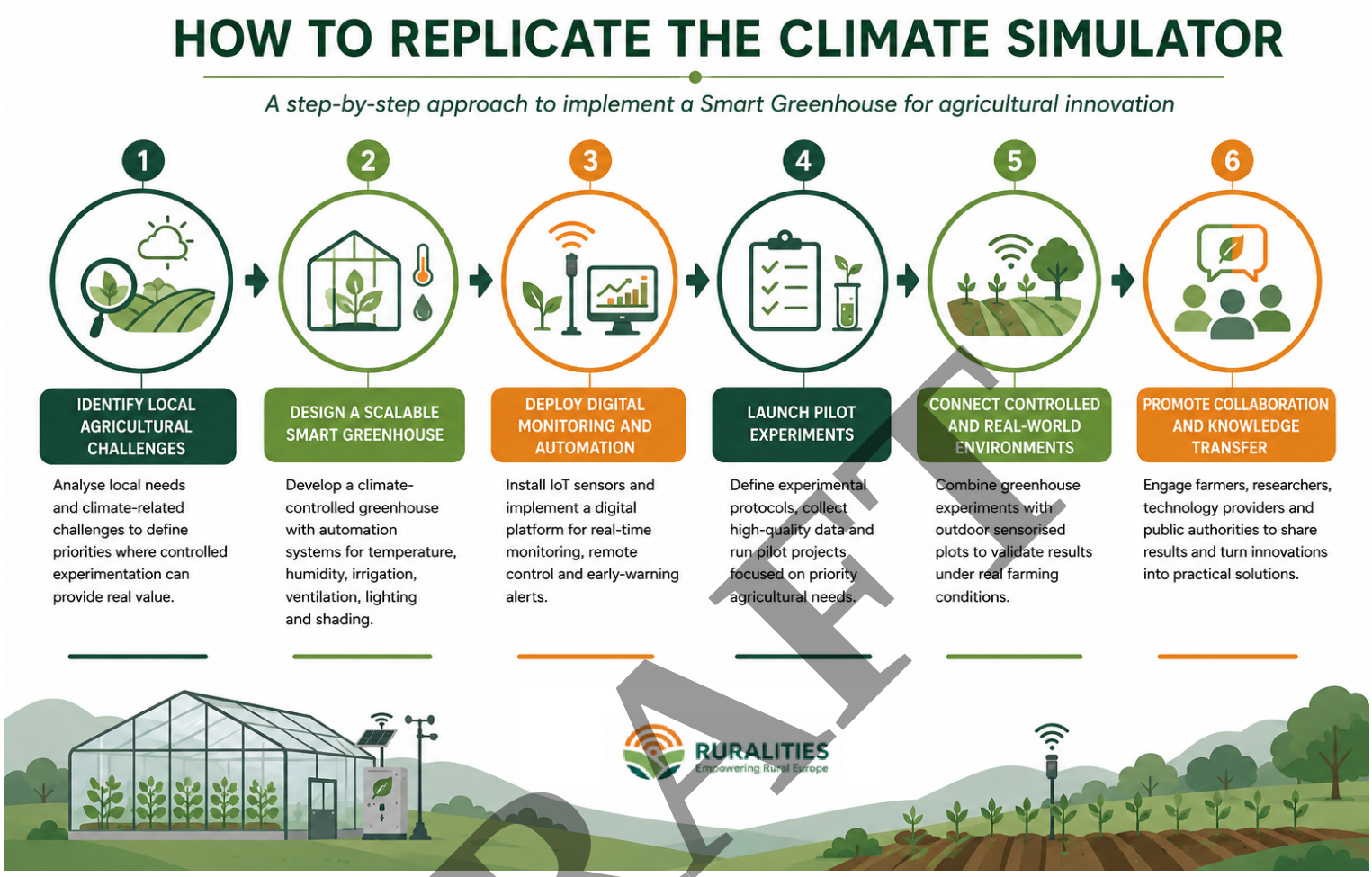


Figure 4 How to replicate climate simulator

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Suggested replication steps

Based on the experience gained, the following recommendations are suggested:

- Design the infrastructure as a multi-purpose experimentation platform, rather than for a single crop or research project.
- Prioritise digitalisation and automation from the outset to maximise reproducibility and operational efficiency.
- Invest in a robust monitoring and data management system, as data quality is fundamental for research and AI development.
- Combine controlled experimentation with field validation to increase the practical applicability of results.
- Build a multidisciplinary team combining agronomy, engineering, digital technologies and data science.
- Develop the infrastructure incrementally, allowing new technologies and research projects to be incorporated over time.
- Ensure continuous engagement with end users so that experimentation addresses real agricultural challenges and supports effective technology transfer.

The key lesson is that successful replication does not require reproducing the same infrastructure but rather adopting the same integrated approach in which climate simulation, digital technologies, automation and stakeholder collaboration work together to accelerate agricultural innovation and climate adaptation.

Lessons Learned

The implementation of the Climate Simulator demonstrated that the value of a Smart Greenhouse lies not only in its ability to reproduce climate scenarios, but in the integration of automation, digital monitoring and data-driven experimentation into a single operational ecosystem. Several lessons emerged during the implementation:

- Digitalisation is as important as climate control. Continuous monitoring, automation and data collection significantly improve the quality, reproducibility and traceability of experimental campaigns.
- High-quality data are essential. Reliable sensors, proper calibration and continuous data validation are fundamental for obtaining trustworthy experimental results and developing Artificial Intelligence applications.
- Flexibility increases long-term value. Designing the infrastructure as a multi-purpose experimentation platform allows it to support different crops, research projects and technological innovations over time.
- Controlled and field experiments are complementary. Combining greenhouse experiments with outdoor sensorised cultivation plots provides more robust evidence and facilitates the transfer of validated solutions to real farming environments.
- Collaboration accelerates innovation. The active involvement of agronomists, engineers, researchers and technology developers improves experimental design and increases the practical impact of research outcomes.

The greatest lesson learned is that building a Smart Greenhouse is primarily a digital transformation process rather than simply the construction of an experimental facility. The long-term value of the

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infrastructure depends on its capacity to continuously generate reliable data, support multidisciplinary research and rapidly adapt to new agricultural challenges and technological developments.

Common Risks or Barriers

Several challenges may affect the successful implementation and operation of a Climate Simulator:

- High initial investment required for infrastructure, automation and monitoring systems.
- Insufficient calibration or maintenance of environmental sensors, leading to inaccurate or inconsistent datasets.
- Poor integration between greenhouse equipment, IoT devices and digital management platforms.
- Limited technical expertise to operate and maintain advanced automation systems.
- Experiments that are too narrowly focused on a single crop or project, reducing the long-term utilisation of the infrastructure.
- Limited collaboration with farmers and end users, reducing the practical relevance and adoption of research outcomes.
- Difficulty in validating controlled experimental results under real agricultural conditions.

Suggested Mitigation Measures

The following measures can help maximise the effectiveness and sustainability of the practice:

- Design the greenhouse as a modular and scalable infrastructure capable of supporting multiple research projects.
- Invest in reliable monitoring equipment, regular sensor calibration and robust data quality procedures.
- Implement an integrated Smart Greenhouse Management Platform from the outset to centralise monitoring, automation and data management.
- Develop standard operating procedures for experimental design, environmental control and data collection to ensure repeatability.
- Build multidisciplinary teams combining agronomy, engineering, digital technologies and data science.
- Establish collaborations with farmers from the early stages to ensure that experiments address real agricultural challenges.
- Complement controlled experiments with outdoor sensorised plots to validate results under operational farming conditions.
- Plan for continuous evolution of the infrastructure by incorporating new sensors, digital tools and emerging technologies such as Artificial Intelligence and advanced analytics.

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RESULTS AND OUTCOMES

Main Results

The Climate Simulator has established a permanent Smart Greenhouse infrastructure that supports controlled agricultural experimentation under reproducible environmental conditions. The infrastructure has successfully enabled:

- The development and validation of multiple research and innovation projects focused on climate adaptation, sustainable agriculture and digital farming.
- Experimental campaigns on traditional crop resilience, including the Fabón de Moal, under simulated future climate conditions.
- Controlled cultivation studies supporting sustainable horticultural production and carbon-related research using lettuce as a model crop.
- The generation of high-quality environmental, agronomic and image datasets for Artificial Intelligence applications.
- The validation of computer vision and hybrid Quantum AI algorithms through the FRESQIA project.
- The integration of controlled greenhouse experimentation with outdoor sensorised cultivation plots to improve the validation of research outcomes under real farming conditions.
- The creation of a reusable research infrastructure capable of supporting future agricultural innovation projects.

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Quantitative Indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

Indicator	Results
Smart Greenhouse infrastructure established	1
Climate-controlled experimental benches	3
Outdoor meteorological station integrated for real-time climate comparison	1
Research and innovation projects supported	4
Industry collaboration projects	4
Crop species tested under controlled conditions	4
Plant health scenarios investigated	3
Environmental and crop parameters continuously monitored	8+
AI-based demonstrators developed	1
Hybrid Quantum AI demonstrators	1
Public and private organisations involved in research and innovation activities at the Climate Simulator	7+
External visitors per year (companies, farmers, schools, universities and public bodies)	500+
Knowledge transfer and dissemination activities showcasing the Climate Simulator	20+

** Knowledge transfer and dissemination activities include conference presentations, scientific and technical workshops, trade fairs, webinars, stakeholder meetings and outreach events where the Climate Simulator, its research outcomes and its applications in climate-smart agriculture are presented to researchers, industry, public authorities and the wider community.*

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Observed Impacts

- Accelerated the validation of climate adaptation strategies by enabling controlled and reproducible experiments under representative future climate conditions.
- Reduced uncertainty before field deployment by testing innovative agricultural practices, technologies and cultivation strategies in a controlled environment.
- Strengthened collaboration between research organisations, technology providers and agri-food companies through shared research and innovation activities.
- Supported the development and validation of digital agriculture solutions, including Artificial Intelligence and hybrid Quantum AI applications for crop monitoring and decision support.

- Enhanced knowledge transfer by showcasing climate-smart agriculture technologies through scientific events, technical workshops, demonstrations and outreach activities.
- Increased the capacity to generate high-quality experimental datasets for research, technology validation and future innovation projects.
- Contributed to improving the resilience and sustainability of agricultural production systems facing climate change.

ADDED VALUE FOR TARGET GROUPS

The Climate Simulator creates significant added value by providing a controlled and digitally enabled environment where innovative agricultural practices, technologies and climate adaptation strategies can be evaluated before being transferred to real farming conditions. It reduces the risks, costs and time associated with conventional field experimentation while generating reliable evidence to support decision-making.

The infrastructure also acts as a collaborative innovation platform, bringing together researchers, agri-food companies, technology providers, public authorities and educational organisations. Through multidisciplinary collaboration, it accelerates the development, validation and transfer of climate-smart agricultural solutions while promoting digital transformation across the agri-food sector.

Target Group	Added Value
Farmers and producers	Ability to evaluate innovative cultivation practices and climate adaptation strategies under controlled conditions before applying them in commercial farms, reducing technical and economic risks.
Agri-food companies	Faster validation of products, cultivation techniques and digital technologies, reducing development time and supporting innovation before market deployment.
Researchers and universities	Access to a controlled experimental infrastructure that enables reproducible studies, multidisciplinary research and the generation of high-quality datasets.
Technology providers	Validation of sensors, monitoring systems, AI applications and digital agriculture solutions in realistic agricultural environments before commercial implementation.
Public authorities and policy makers	Scientific evidence to support climate adaptation policies, sustainable agriculture strategies and data-driven decision-making.
Students and educational organisations	A practical demonstration environment for learning about climate-smart agriculture, digital technologies and sustainable food production.
Society and rural communities	Increased resilience of agricultural systems, promotion of sustainable farming practices and reinforcement of innovation capacity in rural territories.

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TRANSFERABILITY POTENTIAL

Transferability Level

- **Medium**: The Climate Simulator methodology can be transferred to other regions and research environments, but its implementation requires significant investment in specialised infrastructure, climate control systems, digital monitoring technologies and multidisciplinary expertise. While the collaborative approach, experimental protocols and data-driven methodologies are widely applicable, each implementation must be adapted to local climatic conditions, target crops, available resources and the maturity of the regional innovation ecosystem. Consequently, the concept is transferable, but its replication involves technical, financial and organisational challenges that limit widespread adoption.

Easily replicable elements

- Climate-informed experimental methodology based on local meteorological data.
- Digital monitoring and data collection protocols.
- Collaboration model between research organisations, agri-food companies and technology providers.
- Validation approach before field implementation.
- Knowledge transfer methodology linking research with end users.

Elements requiring adaptation

- Investment in greenhouse infrastructure and climate control systems.
- Availability of advanced monitoring, automation and data management technologies.
- Selection of crops and experimental protocols according to local agricultural priorities.
- Climate scenarios based on regional meteorological conditions.
- Access to multidisciplinary expertise in agronomy, engineering and digital technologies.
- Long-term operational and maintenance capacity.

Suitable types of territories

- Agricultural research and innovation centres.
- Living Labs and experimental farms.
- Agricultural technology demonstration centres.
- Regions investing in climate adaptation and digital agriculture.
- Innovation ecosystems with collaboration between research organisations, industry and public authorities.

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REPLICATION BOX

Aspect	Information
Recommended for	Research organisations, universities, agricultural innovation centres, Living Labs, technology centres and demonstration farms working on climate-smart agriculture and digital farming.
Main objective	To validate agricultural practices, technologies and climate adaptation strategies under controlled environmental conditions before field implementation.
Estimated implementation time	18–36 months, depending on infrastructure development, equipment procurement and commissioning.
Required resources	Climate-controlled greenhouse infrastructure, environmental monitoring and automation systems, sensors, meteorological station, ICT infrastructure, data management platform and multidisciplinary technical staff.
Main stakeholders needed	Research organisations, agri-food companies, technology providers, farmers, public authorities and funding organisations.
Main risks	High initial investment, operational and maintenance costs, need for specialised technical expertise, limited long-term funding and insufficient stakeholder engagement.
Cost intensity	High
Technical complexity	High
Stakeholder engagement intensity	Medium–High

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Figure 5 Climate simulator

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2.4 Integrated services for healthy ageing (GMV)

TERRITORIAL CONTEXT

Country / Region	Italy, Veneto Region, Province of Vicenza, Alto Astico Mountain Union
SIMSES	**SIMSES 2; GMV, FHV**
Rural context	The area concerned is that of the Alto Astico Mountain Union, a mountainous area in the Province of Vicenza, together with the neighbouring municipalities of Caltrano and Posina. It is a rural mountain area characterised by depopulation trends and a progressively ageing resident population. The area falls within the intervention scope of the GAL Montagna Vicentina under the current 2023–2027 "Montagna Viva" Local Development Strategy (LDS), funded by the Veneto Rural Development Programme. The geographical marginality and dispersed settlement pattern make the provision of essential services to the population, particularly to older people, especially challenging.



Figure 6 Geolocation of Alto Astico

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Main Challenges Addressed

- Demographic ageing and the vulnerability of the population aged 65 and over.
- Shortage of and difficulties in accessing social and healthcare services, mobility services, and connectivity in mountain areas.
- Depopulation and the limited attractiveness of the area for the working-age and younger population.

Main Stakeholders Involved

- Municipalities of the Alto Astico Mountain Union and neighbouring municipalities (Caltrano and Posina).
- Alto Astico Mountain Union.
- GAL Montagna Vicentina.
- Local social services and residential care facilities for older people.
- Craft enterprises and voluntary associations (mobility services).
- Families, caregivers, and the elderly population.

CHALLENGE

Problem Description

The territory of the Alto Astico Mountain Union is characterised by a significant proportion of elderly residents (aged 65 and over), who are often vulnerable and live in dispersed and peripheral areas, far from service delivery centres. Existing services for older people do not adequately address essential needs that go beyond social and healthcare assistance, including mobility, housing, social relationships, and digital connectivity. This shortfall leads to isolation and difficulties in ageing in place and, consequently, contributes to depopulation, also affecting younger and working-age groups who do not find the area attractive enough to settle in or remain.

Why Was This Important?

Without an integrated intervention, there is a risk of progressive demographic and service desertification, with negative effects both on the quality of life of older people—who may be forced to leave the area or their homes—and on the local economy and employment. Strengthening services for older people was identified as a "driver" capable of generating positive spillover effects for the entire community, including employment opportunities and increased territorial attractiveness for young families.

Target Groups Affected

- Elderly people (65+)
- Caregivers
- Local families
- Municipalities
- Social and health service providers
- Associations
- Rural communities

PRACTICE DESCRIPTION

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Main Activities Implemented

- Empowerment initiatives for families, including home-based social and healthcare support in collaboration with local social services and residential care facilities
- Scheduled mobility services for older people through the involvement of craft enterprises and voluntary associations.
- Social, healthcare, and socialisation support (both home-based and residential) for vulnerable older people.
- Introduction of digital technologies to facilitate communication between older people, social services, and healthcare facilities.
- Day-care and residential respite services for elderly people with illnesses and for their caregivers.
- Pilot co-housing initiatives for self-sufficient older people, involving young families.
- An information and communication plan to promote the attractiveness of the area and encourage the settlement of working-age people.

Methodology / Approach Used

The project adopts a "Community Project" approach, based on the establishment of multi-stakeholder governance involving municipalities, institutions, associations, and local organisations. The approach is grounded in the conceptual shift "from treating to caring", moving from a predominantly social and healthcare assistance model towards a broader approach focused on caring for the person, including mobility, housing, social relationships, and connectivity.

Tools or Resources Used:

- Dedicated social transport service (GAL-led ISL04 call for proposals).
- Digital equipment to support services (GAL-led ISL04 call for proposals).
- Territorial information and communication activities, including information meetings on healthy and sustainable nutrition and family care, projects to engage young people in the stewardship of common goods, parent-child experiences to explore nature through art and play, and a graffiti workshop for teenagers (GAL-led ISL05 call for proposals).
- Existing residential facilities and social services.

Timeline

2023–2027 programming period (PSL "Montagna Viva", LEADER Veneto 2023–2027), with the project starting in 2025 and concluding in 2027.

Organisations Involved

GAL Montagna Vicentina, Alto Astico Mountain Union, local social services, residential care facilities, craft enterprises, and voluntary associations.

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CONDITIONS FOR SUCCESS

Key Success Factors

Construction of an articulated and multi-stakeholder governance system involving all network actors (Alto Astico Mountain Union, GAL, municipalities, and the third sector).

- An integrated approach linking social and healthcare services with mobility, housing, connectivity, and intergenerational activities.
- Involvement of local economic actors and third-sector organisations (volunteering, Auser) alongside the public sector, ensuring flexibility in the operational management of the service.
- A "dual-track" governance model for social transport: primary management through organised volunteering (6 active volunteers), integrated with a formal agreement with a third-sector organisation (Auser), which can be activated when needed — a backup mechanism ensuring service continuity without overburdening the volunteer network.
- A widespread multi-channel communication strategy: a combination of a dedicated website, articles in the local press (Giornale di Vicenza), social media channels, and the municipal network, used both for volunteer recruitment and for promoting the service to end users.
- A fair and differentiated tariff system: a per-kilometre fee up to 40 km and a subsidised fixed fee beyond this threshold, specifically designed to avoid penalising users from the most peripheral municipalities (e.g., Laghi, Pedemonte).
- Investment in dedicated human capital: recruitment of two new professional roles specifically for the project, in line with the project plan, ensuring management continuity.
- A gradual and assessment-based approach to the introduction of digital tools: the adoption of tablets was accompanied by a user assessment screening (approximately 20 people), avoiding a generic and poorly targeted technological introduction.
- Partnership with specialised training organisations (Engim) for the qualification of care workers (family assistants), including a practical component carried out directly within a residential care facility (the nursing home in Arsiero), strengthening the link between training and real-life contexts.
- Activation of specialised partners for youth engagement (Radicà cooperative), which enabled the project's scope to extend beyond the elderly population alone, generating an intergenerational impact.

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Resources Required

- **Human resources:** social workers, 6 active transport volunteers, 2 newly recruited dedicated professional roles, external trainers (Engim), and educators (Radicà).
- **Financial resources:** LEADER/Rural Development Programme (RDP) funds (ISL04 and ISL05, with a total programmed amount of €400,000.00), budget for the purchase of vehicles and tablets, editorial budget for the territorial magazine, and the organisation of events and meetings.
- **Technical resources:** minibuses for social transport, tablets and dedicated software, and a website for online bookings.
- **Organisational resources:** agreement and operational rules with Auser, coordination network between the Alto Astico Mountain Union and associated municipalities, and shared communication channels (social media, press, local tourism and community associations).

Important Preconditions

The definition and implementation of the project are framed within the regulatory context of the "Community Projects" established by Regional Council Resolution (DGR) No. 294 of 21 March 2023, which sets out the essential enabling conditions:

- **Direct involvement of the local community:** a qualifying prerequisite is the active participation of the community both in identifying the need to be addressed and in defining and implementing the project. To this end, GAL Montagna Vicentina organised local meetings and support activities aimed at identifying local needs and building shared commitment around the project. This preparatory work was then translated, during the implementation phase, into a service effectively used by the community (approximately 10 users already in the first months) and into a volunteer network specifically activated within the area.
- **Activation of at least two interventions:** by definition, a community project requires the activation of at least two interventions (in addition to any GAL support and accompaniment intervention). In this specific case, these are ISL04 (social transport) and ISL05 (information/training), both of which have become operational and have shown concrete progress already five months after the start of the project.
- **Structure across two implementation phases:**
  • **Preparatory phase (optional):** aimed at the precise identification of community needs and at promoting community involvement in project design, also through the support activities provided by the GAL.
  • **Implementation phase (mandatory):** in which the beneficiaries of the PSL interventions that concretely deliver the project are identified. In the case analysed, this phase involved the activation of minibuses, volunteers, agreements, dedicated staff, training pathways, and youth initiatives, with periodic monitoring through alignment meetings between the GAL and the Mountain Union.
- **Nature of the intervention:** the project must consist of the activation or strengthening of a service, or the enhancement of an underused "common good". This condition has been fulfilled through the creation of the social transport service (a new service) and the strengthening of local care skills through family caregiver training.
- **GAL support role:** a key organisational prerequisite is the availability of a support structure (the GAL itself) capable of facilitating both the preparatory and implementation phases, acting as a link between the needs expressed by the community and the financial and operational tools of the PSL. This role has been confirmed through periodic alignment and monitoring meetings with the Alto Astico Mountain Union (e.g., the meeting held in May 2026), which allow continuous operational adjustments to the project during its implementation.

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REPLICATION GUIDANCE

Step 1 – Analyse the demographic profile of the area (ageing index, depopulation trends) and map the existing services available for the elderly population.

Step 2 – Establish a multi-stakeholder governance group (municipalities, Local Health Authority/social services, GAL, voluntary associations, and local businesses).

Step 3 – Co-design a set of integrated actions that go beyond healthcare assistance (mobility, housing, connectivity, and socialisation).

Step 4 – Identify available funding sources (LEADER, regional/national/European funds for territorial cohesion) and define the allocation of roles among the different organisations involved.

Step 5 – Launch a pilot action (e.g., a social transport service or an experimental co-housing initiative) and support it with communication activities aimed at increasing territorial attractiveness.

Lessons Learned

- The integration between the social and healthcare dimension and the economic/employment dimension strengthens the sustainability of the intervention.
- Involving local economic actors (not only public and non-profit organisations) broadens the available resources and creates employment-related benefits.

Common Risks or Barriers

- Difficulties in coordinating multiple organisations with different areas of responsibility and timelines.
- Risk of fragmentation if governance structures are not well established.

Suggested Mitigation Measures

- Clearly define the roles and responsibilities of each stakeholder within the governance structure from the initial stages.
- Identify a lead organisation (in this case, the Mountain Union with the support of the GAL) responsible for ensuring stable coordination.

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RESULTS AND OUTCOMES

Main Results

ISL04 – non-productive investments in rural areas (social transport service)

- Social transport service operational since early January 2026, managed by the Alto Astico Mountain Union with the involvement of 6 volunteers.
- Collaboration initiated with Auser, formalised through an agreement and dedicated regulations, for the possible future management of the service (currently, demand is fully covered by volunteers).
- A dedicated section has been created on the Alto Astico Mountain Union website (altoastico.it) for online service bookings, although most requests are still received by telephone.
- An affordable tariff system has been established: €0.55/km up to 40 km; a fixed fee of €28 beyond 40 km, to support users from the most distant municipalities (e.g., Laghi, Pedemonte).
- Approximately 10 users have used the service so far.
- A communication campaign has been launched to recruit volunteers and promote the service through the website, articles in the Giornale di Vicenza, social media channels, and direct support from the municipalities involved.

- Tablets and dedicated software have been purchased to provide digital support for the service; a user assessment screening involving approximately 20 people was carried out in May 2026, with further updates planned in the following weeks.
- Two new professional roles were recruited from January 2026, as foreseen in the project plan.

ISL05 – Information to improve the accessibility and usability of rural areas

- A printed magazine, "Altoastico Informa", is currently being developed and has been formally registered. It will be distributed to all households in the area, with two issues planned for 2026 and two for 2027.
- Territorial events are being organised for mid-June 2026 (theatre performances and other initiatives), with promotion through the social media channels of the Mountain Union, municipalities, and the local Pro Loco associations involved.
- A family caregiver training course, organised in collaboration with Engim, has been completed (or is nearing completion). It started at the end of February 2026 and includes a practical component carried out at the Arsiero nursing home, with 13 enrolled participants.
- A new course on nutrition is scheduled to start from June 2026 and continue through 2027.
- Youth-focused initiatives have been activated in collaboration with the Radicà cooperative:
- **"Ci sto a fare fatica" (Arsiero):** involvement of 2 teams of 10 young people each, engaged in community service activities at a local school.
- **"Graffiti" project:** involvement of middle and high school students.
- Outdoor summer activities for children, held at the temporary location of the Velo library.

Quantitative Indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

Indicator	Result
Users of the social transport service	10
Volunteers involved in social transport	6
Users involved in the tablet/digital screening	20
New professional roles recruited	2 (from January 2026)
Participants in the family caregiver training course (Engim)	13
Young people involved in the "Ci sto a fare fatica" project	20 (2 teams of 10)
Planned issues of "Altoastico Informa" magazine	4 (2 in 2026, 2 in 2027)

Observed Impacts

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Approximately 4–5 months after the operational start (January 2026), the project shows concrete signs of implementation across both activated LEADER interventions.

Regarding mobility (ISL04), the social transport service is fully operational, with an initial established user base and a mixed governance model (volunteering + agreement with Auser) that ensures flexibility in service management. The digital component (tablets) is currently undergoing active assessment with users, demonstrating an iterative approach to the introduction of technologies.

Regarding the information component (ISL05), the project has successfully activated a wide range of communication channels (local press, social media, municipalities, and Pro Loco associations) and has generated impacts that extend beyond the elderly population alone, actively involving young people and adolescents through educational and active citizenship initiatives (Radicà, Graffiti). This confirms the intergenerational approach of the "from treating to caring" strategy.

There is still room for improvement in promoting the online booking channel, which remains less used compared to telephone contact.

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ADDED VALUE FOR TARGET GROUPS

Indicator	Result
Older people	Concrete access to an operational social transport service (subsidised fares, including for more distant municipalities such as Laghi and Pedemonte); introduction of digital tools (tablets) supported by a personalised assessment of skills and needs; access to qualified assistance thanks to the training of new family caregivers.
Municipalities of the Alto Astico Mountain Union	A social transport service managed at an inter-municipal level, with visibility ensured through shared communication channels (website, social media, local press); improved territorial coordination through the "Altoastico Informa" magazine.
SMEs/craft enterprises	No new specific data emerged from the May 2026 update — the involvement foreseen in the project plan still requires further operational consolidation.
Young people	Direct involvement through structured initiatives with the Radicà cooperative ("Ci sto a fare fatica": 20 young people engaged in school service activities; the "Graffiti" project involving middle and high school students) and summer activities for children at the Velo library. The project therefore generates intergenerational value, extending beyond services for older people alone.
Caregivers and families	New training opportunities (family caregiver course with Engim, 13 participants; new nutrition course starting from June 2026) that strengthen care skills within the local community.
Voluntary organisations (Auser and others)	Active and formalised role in the management of the transport service (agreement and regulations with Auser), with an initial group of 6 active volunteers.
Policy makers / GAL	Availability of a concrete operational example of a "Community Project" under DGR No. 294/2023, with measurable results achieved less than six months after the start. The project provides a useful reference for reporting purposes and for potential replication in other LEADER areas.

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TRANSFERABILITY POTENTIAL

Transferability Level

- Medium

Easily Replicable Elements

- Social transport service governance model based on organised volunteering (6 volunteers), integrated with an agreement with a third-sector organisation (Auser) as a "backup network".

- Differentiated tariff system based on distance ranges (per-kilometre fee up to 40 km, fixed fee beyond this threshold), easily adaptable to other mountain contexts with peripheral municipalities.
- Multi-channel communication strategy for service promotion and volunteer recruitment (website, local press, social media, and municipal network).
- Territorial printed magazine format ("Altoastico Informa") as a tool for widespread information dissemination in areas with limited connectivity.
- Short and targeted training pathways (e.g., family caregiver course with a practical component in a residential care facility), which can be implemented in partnership with training organisations (Engim).

Elements Requiring Adaptation

- The online booking channel is still underused compared to telephone contact: the digital component requires a specific cultural and generational adaptation process for each territory.
- The introduction of digital tools (tablets) requires a personalised user screening and assessment phase, which must be scaled according to the number of beneficiaries and the available resources.
- Involving young people through cooperatives such as Radicà requires the presence of specialised youth engagement partners in the area, which are not always available in all rural contexts.
- The recruitment of dedicated professional staff (2 positions since January 2026) requires sufficient budget availability and several users that justifies the investment.

Suitable Types of Territories

- Mountain areas with dispersed municipalities and significant distances between population centres.
- Rural areas characterised by strong demographic ageing and the need for dedicated mobility services.
- Territories with an existing or potentially activatable network of organised volunteering.
- Contexts where a network of municipalities is available and willing to share an inter-municipal service.

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REPLICATION BOX

Aspect	Information
Recommended for	Mountain Unions or rural municipal aggregations with a dispersed elderly population and a shortage of mobility and socialisation services.
Main objective	To activate an inter-municipal social transport service and integrated information/training actions aimed at "caring for" the community, with particular attention to older people while generating intergenerational benefits.
Estimated implementation time	Approximately 5–6 months for the operational launch of the transport service (January–May 2026), with consolidation and further information/training activities planned through 2027.
Required resources	Transport vehicles (minibuses), tablets and dedicated software, budget for 2 new professional roles, funding for editorial activities (magazine) and training initiatives (courses with organisations such as Engim), and agreements with voluntary organisations (e.g., Auser).
Main stakeholders needed	Mountain Union/lead organisation, GAL, associated municipalities, voluntary associations (e.g., Auser), training organisations (e.g., Engim), social cooperatives for youth activities (e.g., Radicà), and local Pro Loco associations.
Main risks	Low uptake of the digital booking channel; difficulties in recruiting enough volunteers over time; need to consolidate the financial sustainability of the service beyond the start-up phase.
Cost intensity	Medium
Technical complexity	Medium
Stakeholder engagement intensity	High

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Figure 7 Integrated services for Healthy Ageing in Alto Astico

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2.5 From apple scraps to unique products (NIC)

TERRITORIAL CONTEXT

Country / Region	Slovenia / Central Slovenia and Upper Carniola
SIMSES	**SIMSES 4 NIC**
Rural context	The Central Slovenia Statistical Region covers 2,334 km² and comprises 25 municipalities, with Ljubljana as its geographic and economic hub. Home to roughly 570,000 residents, it is the largest and most populous statistical region in the country. The Upper Carniola Statistical Region is a statistical region in northwest Slovenia. It is a region with high mountains, including Mount Triglav, and is almost entirely Alpine.

Main Challenges Addressed

- raising awareness of reusing food scraps
- raising awareness of waste reduction
- raising awareness of the circular economy

Main Stakeholders Involved

- SMEs
- NGOs
- Farmers
- High Schools
- Fashion designers
- General public

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CHALLENGE

Problem description

The fruit processing industry generates substantial quantities of apple pomace as a by-product of apple juice, cider, and purée production. Due to its high moisture content, apple pomace rapidly undergoes fermentation if it is not processed promptly. As a result, it is frequently discarded as waste or used for low-value applications, leading to unnecessary resource loss, greenhouse gas emissions, and increased pressure on waste management systems.

At the same time, conventional leather production and petroleum-based synthetic leather are associated with considerable environmental impacts, including intensive water and energy consumption, the use of

hazardous chemicals, dependence on fossil resources, and the generation of persistent plastic waste. There is a growing need for sustainable, bio-based materials that can replace these conventional products while supporting circular economy principles. Converting apple pomace into biodegradable fruit leather addresses both challenges by transforming an underutilised agricultural by-product into a high-value material suitable for a wide range of applications. This approach benefits fruit processors, manufacturers, designers, consumers, and the environment by reducing waste and promoting more sustainable production and consumption practices.

Why Was This Important?

Addressing this challenge is essential to promoting a more sustainable and resource-efficient bioeconomy. Valorising apple pomace reduces organic waste, lowers greenhouse gas emissions, and supports circular economy principles by converting an abundant agricultural by-product into a valuable raw material. At the same time, developing biodegradable fruit leather helps reduce dependence on animal leather and petroleum-based synthetic materials, both of which have significant environmental impacts. This innovative approach contributes to more sustainable production and consumption patterns while creating new economic opportunities for the fruit processing industry, designers, and manufacturers of eco-friendly products.

Target Groups Affected

- SMEs
- Farmers
- High Schools
- General public

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PRACTICE DESCRIPTION

Main Activities Implemented

- Workshops
- Podcast / Interview
- Lectures

Methodology / Approach Used

To prepare 100 kg of the fruit leather mixture, apple pulp made from 74 kg of apple pomace treated with citric acid is used. Next, 24 kg of fillers (cellulose, microcrystalline cellulose), 1 kg of glycerol, 0.6 kg of choline chloride, and 0.4 kg of $CaCl_2$ are added to the homogeneous apple pulp. Dyes are added to prepare colored leather. After drying 100 kg of the prepared mixture, 12 to 15 kg of fruit leather is obtained. Preparing 1 kg of fruit leather consumes 5 to 6 kg of pomace and 0.25 kg of additives.

Tools or Resources Used

Timeline

- Workshops #From apple scraps to unique products", 17 April – 18 April 2025 (Bled, Slovenia)
- Workshops #From apple scraps to unique products", 24 October 2025 (Bled, Slovenia)
- From laboratory to user (online, podcast)
- Workshops #From apple scraps to unique products", 1 December 2025 (Ljubljana, Slovenia)
- Inspiring the next generation of scientists, 22 January 2026 (Ljubljana, Slovenia)

Organisations Involved

- Higher Vocational College for Hospitality, Wellness and Tourism Bled
- BSC Kranj - Gorenjska Development Region
- Ministry of the Economy, Labour and Sport
- Biotechnology Center Naklo
- Panvita
- Jezeršek gostinstvo

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CONDITIONS FOR SUCCESS

Key Success Factors

- Promotion via social media, through marketing materials (posters, leaflets, etc.) and similar workshops/events

Resources Required

- Human resources
- Financial resources
- Technical resources
- Organisational resources

Important Preconditions

Successful implementation requires a reliable supply of fresh apple pomace from fruit-processing facilities, as the material must be processed shortly after production to prevent fermentation. Appropriate equipment for thermal treatment, mixing, drying, and compression is necessary to ensure consistent material quality. In addition, suitable additives and processing parameters are required to produce fruit leather with the desired mechanical properties, flexibility, and water resistance.

REPLICATION GUIDANCE

To replicate this practice, first establish collaboration with local fruit processors to secure a continuous supply of fresh apple pomace. Since apple pomace is highly susceptible to fermentation, it should be thermally treated immediately after collection to stabilise the raw material. Next, prepare a homogeneous mixture by combining the treated pomace with suitable additives, including fillers, a plasticiser, a moisture regulator, and calcium chloride. Spread the mixture uniformly on trays or moulds

and dry it under controlled conditions. Once dried, compress the material to a thickness of approximately 1.0–1.5 mm and apply a protective wax coating to improve water resistance. Finally, evaluate the material properties and adjust the formulation or processing conditions, if necessary, to meet the requirements of the intended application. The resulting fruit leather can then be converted into a variety of sustainable products, such as packaging materials, accessories, decorative items, and other design-oriented products.

Lessons Learned

Common Risks or Barriers

- Seasonal availability of apple pomace, rapid fermentation of the raw material if not processed promptly, variability in raw material quality, and market acceptance of bio-based products.

RESULTS AND OUTCOMES

Apple fruit leather is a flexible, leather-like material made from apple pomace – the leftover peel, pulp, and other fruit residues generated during the production of apple juice, cider, or pure production. Instead of being discarded as waste, these by-products can be turned into a durable, eco-friendly material through drying and processing. Fruit leather is produced from apple pomace by incorporating fillers, a plasticizer, a moisture regulator, and calcium chloride ($CaCl_2$). Prior to processing, the apple pomace is thermally treated to prevent fermentation. It is then mixed with the additives to form a homogeneous mixture. The resulting blend is evenly spread onto trays or molds and dried. Once dried, the fruit leather is compressed to a standard thickness of 1.0–1.5 mm and treated with waxes to create a water-repellent surface.



Figure 8 Apple scraps (left) and apple pomace (right).

Fruit leather is biodegradable and renewable and offers a sustainable alternative to conventional leather and synthetic materials. It can be manufactured as a semi-finished material for further processing, as a decorative material, or as a component for packaging and protective applications.

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Figure 9 Apple pulp before drying (left) and apple leather with its natural colour (right).



Figure 10 Examples of fruit leather production during workshops.



Figure 11 Fashion design of unique products.

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The benefits of this innovative practice span the entire value chain, positively impacting various stakeholders such as agricultural sector and fruit processors, designers, consumers and society. By valorising apple processing residues, fruit leather supports the principles of the circular economy by

reducing food waste and creating high-value products from agricultural by-products. This innovative material can be used to manufacture a wide range of distinctive and sustainable products, including jewellery, notebook covers, wallets, pouches, phone and tablet cases, keyrings, gift packaging, decorative accessories, and other design-oriented items.



Figure 12 Unique, handmade products made from upcycled fruit processing leftovers.

Using apple by-products in this way not only minimizes environmental impact but also demonstrates how food-industry waste can be converted into functional, aesthetically appealing, value-added products, contributing to more sustainable production and consumption practices.

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Quantitative Indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

Indicator	Result
Number of participants	Approximately 200
Number of workshops	3
Number of stakeholders engaged	Approximately 50

Observed Impacts

The workshops increased participants' awareness of the potential of apple pomace as a valuable raw material within a circular bioeconomy. Participants gained practical knowledge of the fruit leather production process, from raw material preparation for the fabrication of finished products. The demonstrations highlighted the feasibility of converting fruit processing residues into biodegradable, value-added materials and stimulated discussions on new applications in design, packaging, and sustainable manufacturing. The workshops also encouraged collaboration between researchers, fruit processors, designers, and other stakeholders, fostering interest in adopting similar circular solutions in different regions.

ADDED VALUE FOR TARGET GROUPS

Target Group	Added Value
Farmers	Increased value of agricultural by-products through the utilisation of apple pomace, creating opportunities for additional income and reducing organic waste.
Municipalities	Reduced organic waste sent to landfills or incineration, contributing to lower
SMEs	New business opportunities for fruit processors, manufacturers, designers, and artisans through the production of innovative, biodegradable materials and sustainable consumer products.
Youth	Increased awareness of circular economy principles and sustainable material innovation, encouraging creativity and entrepreneurship in the bioeconomy sector.
Women entrepreneurs	Opportunities to develop and market eco-friendly, design-oriented products made from fruit leather, supporting sustainable and creative businesses.
NGOs	A practical example of waste valorisation and circular economy that can be promoted through environmental education, awareness campaigns, and community initiatives.
Policymakers	Evidence of an innovative circular bioeconomy solution that supports waste reduction, resource efficiency, sustainable production, and climate objectives, helping to inform future environmental and innovation policies.

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TRANSFERABILITY POTENTIAL

Transferability Level

- Medium

Suitable Types of Territories

- Agricultural regions

REPLICATION BOX

Aspect	Information
Recommended for	Fruit processors, SMEs, research organisations, vocational training centres, designers, circular bioeconomy initiatives, and local authorities interested in waste valorisation.
Main objective	To convert apple pomace into biodegradable fruit leather and demonstrate its potential as a sustainable alternative to conventional leather and synthetic materials while promoting circular economy principles.
Estimated implementation time	3-6 months for pilot implementation, depending on equipment availability, raw material supply, and product development activities.
Required resources	Fresh apple pomace, thermal treatment equipment, mixers, drying equipment, compression equipment, additives (fillers, plasticizer, moisture regulator, calcium chloride), wax coating, trained personnel, and collaboration with fruit processors.
Main stakeholders needed	Fruit processors, researchers, SMEs, designers, local authorities, educational institutions, and sustainability organisations.
Main risks	Seasonal availability of apple pomace, rapid fermentation of the raw material if not processed promptly, variability in raw material quality, and market acceptance of bio-based products.
Cost intensity	Medium
Technical complexity	Medium
Stakeholder engagement intensity	High

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Figure 13 From Apple Scraps to Unique Products

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2.6 Safflower Cultivation as an Economic and Social Income Supplement for Vulnerable Rural Areas in Montefeltro (IISAC)

TERRITORIAL CONTEXT

Country / Region	Italy / Marche Region
SIMSES	SIMSES 1; IISAC
Rural context	The Montefeltro territory is structurally complex, characterized by a sharp economic divide between thriving urbanized coastal areas and vulnerable, depopulated inland rural areas. While these interior communities maintain deep cultural and territorial roots, the current economic landscape makes it incredibly difficult for young generations to remain. This lack of financial sustainability directly threatens the region's demographic stability and hinders essential generational turnover in agriculture.

Main Challenges Addressed

- Supplementing stagnant family farm incomes with high-margin alternative crops.
- Establishing a stable revenue system insulated from global commodity price fluctuations.
- Facilitating generational turnover by creating viable, modern economic prospects for rural youth.

Main Stakeholders Involved

- Local Municipalities
- Individual and Associated Farmers / Agricultural Consortia
- Downstream Processing SMEs & Bio-Based Extraction Industries
- Local Agricultural Trade Unions (Organizzazioni Sindacali)
- Vocational Training Schools (Istituto Agrario Antonio Cecchi di Pesaro)
- Regional Development & Research Entities (CeRSAI, GAL Montefeltro, La Corte della Miniera / Museum Graphia)

CHALLENGE

Problem Description

Traditional agriculture in the inland areas of Montefeltro has long relied on conventional crops like wheat and alfalfa. While these crops provide operational consistency, their financial returns are low and increasingly vulnerable to intense market competition from third-country imports. This structural

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economic cap makes it impossible for small-scale local farms to generate incomes comparable to intensive agricultural or coastal industrial sectors.

Consequently, younger generations are forced to abandon family farms, accelerating rural depopulation. While local farmers recognize the need for change, they display deep deep-seated scepticism toward introducing unfamiliar crop varieties. Safflower represents a powerful alternative, but because it sits entirely outside the traditional local mindset for human or animal nutrition, producers hesitate to commit without verified economic guarantees.

Why Was This Important?

Intervention was urgently required to revitalize the local economic framework before the loss of generational turnover became irreversible. Safflower (cartamo) represents an ideal solution because it offers an agronomical "free window": its harvesting timeline does not conflict with traditional grain or forage seasons, allowing farmers to optimize their existing laboratory and machinery. However, to transform this technical potential into territorial adoption, the project needed to build a structured value chain that could transparently prove the crop's economic viability and establish secure commercial off-take pathways.

Target Groups Affected

- Primary Producers & Farmers: Individuals and cooperatives requiring risk-mitigated crop alternatives to stabilize and improve their household revenues.
- Vocational Schools & Agronomy Students: The next generation of agricultural operators who need practical, modern skills to anchor a new tradition in the territory.
- Processing & Value-Chain Industries: Local oil mills and bio-based businesses seeking a steady, certified supply of high-quality local raw materials.

PRACTICE DESCRIPTION

Main Activities Implemented

- Experimental Cultivation & Agronomic Baseline: Conducted a rigorous two-year field trial on experimental plots at the Istituto Agrario Antonio Cecchi to monitor all phenological stages of safflower and optimize local cultivation guidelines.
- Certified Extraction & Property Analysis: Managed the technical harvesting and subsequent processing of the experimental crop to run certified laboratory analyses on the extracted oil and processing by-products, identifying clear commercial end-use profiles.
- Contractual Value-Chain Architecture: Transformed scientific data into an operational economic framework by drafting standardized agricultural supply contracts for a pioneer cohort of farmers to launch large-scale regional production.

Methodology / Approach Used

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The practice relies on a direct, hands-on field operations approach seamlessly linked to a proactive stakeholder engagement model. By anchoring the trial inside a prominent regional agricultural school, the project bridges the gap between scientific experimentation and practical farming. The rollout leverages trusted local agricultural trade unions to build grassroots momentum, using peer-to-peer word-of-mouth (passaparola) and transparent financial roadmaps to turn abstract research into common, community-wide farming practice.

Tools or Resources Used

- Living Labs: The dedicated experimental field plots at the Istituto Cecchi used as an open-air classroom and agricultural testing sandbox.
- Technical Workshops: A series of mobile-accessible online training sessions tailored to remote producers, covering crop protection and input logistics.
- Stakeholder Seminars: In-person matching events aligned with harvest and extraction milestones to connect growers directly with bio-industrial buyers.
- Expert Mentoring Lines: Continuous coaching frameworks providing customized technical assistance for field management and pest control.

Timeline

- **2024 – Summer 2026:** Two-year initial agronomic trials, field monitoring, and seed multiplication at the Istituto Cecchi.
- **September 2026:** Execution of pilot mechanical extraction, chemical laboratory profiling, and finalization of industrial end-use certifications.
- **January – March 2027:** Launch of the primary enrolment campaign, conducting online workshops and signing the first large-scale farmer cultivation contracts.
- **April – July 2027:** Spring sowing and field deployment, supported by active student Living Labs and direct expert field coaching.
- **August – September 2027:** Execution of the first fully scaled commercial harvest, territorial yield quantification seminar, and secondary processing phase.

Organisations Involved

- Istituto Antonio Cecchi di Pesaro (Lead Host & Field Operations)
- CeRSAI (Agronomic Development & Mentoring Coordination)
- La Corte della Miniera / Museum Graphia (Commercial Mapping & Processing Strategy)
- GAL Montefeltro (Data Analysis, Dissemination & Local Animation)
- Local Agricultural Trade Unions (Organizzazioni Sindacali)

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CONDITIONS FOR SUCCESS

Key Success Factors

- Verified Economic Advantage: The entire supply chain hinges on proving that safflower oil and its processing by-products generate reliable, high margin returns that directly outcompete volatile traditional grains.
- Zero-Capital Technical Adaptability: The crop must seamlessly fit into existing farm infrastructures. Success relies on the fact that farmers can utilize their current machinery without requiring expensive new equipment purchases.
- Community Trust & Communication: Overcoming cultural resistance requires transparent communication. Leveraging successful pioneer growers to spread positive results via local networks (passaparola) is the single most effective tool for community persuasion.

Resources Required

- Human Resources: Multidisciplinary experts from the Horizon Europe framework to split training duties (CeRSAI for agronomy, Istituto Cecchi for field integration, Corte della Miniera for market positioning, GAL for data tracking).
- Financial Resources: Operational allocation for initial workshop setups, transitioning into an autogenerating commercial model via secured industrial off-take contracts.
- Technical Resources: Access to specialized extraction facilities, certified chemical testing labs, and basic digital meeting platforms for virtual training delivery.
- Organisational Resources: Pre-established institutional access to local agricultural union communication channels to guarantee broad, trusted outreach.

Important Preconditions

Before launching territorial deployment, a formal, highly structured inter-organisational coordination system must be fully active. Because the project bridges distinct sectors—moving from raw field production to laboratory analysis and downstream industrial sales—any break in the communication loop between partners will stall the workflow. A fluid but clearly defined division of institutional responsibilities is an absolute prerequisite for success.

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REPLICATION GUIDANCE

Suggested Replication Steps

To successfully transfer this agricultural value-chain practice to another rural territory without incurring high capital failure risks, follow this structured procedural roadmap:

1.Agricultural Context Analysis: Phase 1: Feasibility.

Evaluate local soil compositions, climatic conditions, and existing traditional crop cycles. It is vital to identify an agronomic "free window" where safflower cultivation and harvesting will not actively compete for laboratory or calendar time with the region's main traditional crops.

2.Economic and Machinery Audit: Phase 2: Infrastructure.

Conduct a detailed audit of the machinery already owned by local smallholders (tractors, seeders, standard combine harvesters). The practice should only move forward if it can be verified that the new crop requires zero new capital investments in specialized machinery for the farmers.

3.Model Trial Plot Implementation: Phase 3: Validation.

Establish localized experimental model plots, ideally collaborating with a regional agricultural vocational school or public research farm. Run a multi-season trial to optimize the local agronomic baseline, manage pest variables, and create a highly visible peer-to-peer demonstration field for sceptical local producers.

4.Value Chain Cross-Association: Phase 4: Integration.

Instead of building an isolated value chain from scratch, directly partner with the established Montefeltro regional network. This cross-association allows the replicating territory to tap into existing bio-based extraction expertise, processing facilities, and pre-certified downstream commercial buyers.

5.Consortium Guidance and Field Monitoring: Phase 5: Rollout.

Formally deploy a centralized institutional support system led by a regional consortium or expert committee. This body acts as a lean coordinator, issuing standardized agricultural supply contracts, setting crop calendars, providing digital pest alerts, and ensuring strict quality compliance across all fields.

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Lessons Learned

- **Agronomic System**: Safflower proves to be exceptionally resilient in marginal, drought-prone rural lands, making it a powerful climate-adaptation crop. However, success depends heavily on precise calendar mapping for mechanical weeding and targeted early pest interventions to protect initial crop yields.
- **Economic System:** Farmers will not alter their generational crop choices based on theoretical benefits alone. The economic framework—specifically guaranteed off-take contracts and transparent price-per-ton security—is the absolute structural driver required to turn experimental crops into common local practice.

Common Risks or Barriers

- **Low Operational Budget:** Replicating rural regions often suffer from limited public funds and lack the capital to subsidize new agricultural startups or build advanced processing facilities.

Suggested Mitigation Measures

- **Zero-Overhead Shared Platforms**: Mitigate low-budget barriers by maximizing pre-existing assets. Utilize regional agricultural high school fields for trials, deploy free mobile-friendly webinar tools for technical training, and leverage international networks—such as onboarding

partner universities and cross-border consortium members—to pool scientific data and share industrial value chain setups without additional infrastructure costs.

RESULTS AND OUTCOMES

Main Results

- International Institutional Onboarding: Successful engagement and formal adherence of at least one African country from the wider RURALITIES consortium alongside an active university partner system, serving as an international cooperative launchpad for the adaptation framework.
- Implementation of a Unified Value Chain (Filiera Unica): The successful establishment of a singular, highly synchronized production and processing pathway that links primary rural field cultivation directly to certified bio-industrial buyers on a single operational platform.

Quantitative Indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

Indicator	Result
Number of participants	1 Associated African Country & 1 Partner University System
Number of workshops	4 Technical and operational webinars delivered
Number of stakeholders engaged	At least 1,000 Hectares (Ha) of scaled regional cultivation target

Observed Impacts

A Synchronized Economic Ecosystem: The main observed improvement is the transformation of fragmented smallholder farming into a unified, collaborative system. By placing all primary producers, research partners, and industrial processors onto the same shared economic and data platform, the project functions as a single production system. This structural alignment eliminates traditional middleman friction, matches field yields directly with market demand, and secures a predictable income stream that actively supports rural retention for the next generation of growers.

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ADDED VALUE FOR TARGET GROUPS

Target Group	Added Value
Farmers	Risk-free income diversification: Provides a high-margin alternative crop that perfectly fits into the spring agronomic "free window." Because it utilizes existing standard machinery, farmers achieve a reliable, contractually guaranteed
Municipalities	Rural retention and demographic stabilization: Counters chronic inland depopulation by revitalizing marginal fields. It transforms underutilized land into an active bio-economic zone, keeping economic value—and families—within the local territory.
SMEs	Short, certified supply chains: Local extraction mills, processors, and bio-based manufacturers gain direct access to a stable, traceable, and chemically profiled supply of raw materials. This eliminates reliance on volatile international markets and unpredictable middlemen.
Youth	Viable agricultural futures: Vocational students transition from passive learners to active value-chain co-creators. By mastering modern, sustainable agro-ecological practices through the Living Labs, they gain a concrete financial reason to stay and manage family farms.
Women entrepreneurs	High-value diversification niches: The unique properties of safflower oil and its processing by-products open immediate doors for downstream micro-ventures, particularly in high-margin sectors like artisanal biocosmetics, specialized food products, and eco-friendly printing inks or textile dyes.
NGOs	Field-tested sustainability blueprint: Receives a fully operational, low-cost model for community-led climate adaptation and circular economy. It provides a real-world advocacy tool that proves ecological transition can run together with financial profit.
Policymakers	Scalable regional development strategy: Delivers a data-backed, zero-overhead framework that successfully bridges public vocational education with regional trade unions and private industries, offering a highly replicable blueprint for regional funding allocation

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TRANSFERABILITY POTENTIAL

Transferability Level

- High - the practice exhibits exceptional transferability potential because safflower addresses a highly defined, scalable, and expanding market interest in the bioeconomy. Furthermore, it avoids the friction of new infrastructure deployment by mimicking stable, pre-existing regional crop models.

Easily Replicable Elements

- Parallel Supply Chain Architecture: The entire operational format is structurally stable because it runs on lines parallel to well-established oilseed sectors, such as the sunflower seed oil supply

chain *(filiera del girasole).* It shares identical collection logistics, storage requirements, crushing dynamics, and cooperative organizational structures. Any region with a history of sunflower or grain production can replicate this blueprint overnight without adapting its core agricultural frameworks.

- **Modular Multi-Product Utilization Model**: The replication strategy relies on a clear, pre-mapped understanding of the outputs generated during the safflower transformation process:
    - Primary Extracted Oil: Can be directed immediately into high-value commercial streams depending on regional demand (e.g., premium food grading, industrial bio-lubricants, or specialized cosmetic bases).
    - Processing By-Products: The residual seed cake (pannello di estrazione) provides an immediate, localized revenue stream when channeled directly into the regional animal feed and livestock sector as a high-protein supplement.

Elements Requiring Adaptation

- Cereal Mechanization Infrastructure Baseline: The local agricultural system must already possess a foundational mechanization infrastructure aligned with extensive cereal farming. While safflower does not require expensive, highly specialized equipment, replicating territories must adapt and calibrate their existing machinery—specifically standard grain seeders and combine harvesters—to handle the specific seed density, plant height, and threshing parameters of this specific crop.

Suitable Types of Territories

- Mountain areas: Upland and marginal terrains characterized by challenging topographic conditions where traditional high-input crops are economically unviable and hardy, drought-resistant alternatives are needed.
- Remote rural areas: Inland, isolated communities experiencing severe demographic decline, depopulation, and low generational turnover that require stable economic anchors to retain the local population.
- Agricultural regions (Low-Specialization Extensive Farming): Rural zones primarily dedicated to large-scale, low-yield extensive crops (such as rainfed industrial grains or traditional forage) that urgently require high-margin crop rotation alternatives to boost overall farm profitability.

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REPLICATION BOX

Aspect	Information
Recommended for	Mountain areas, remote rural areas, and low-specialization agricultural regions practicing extensive farming (e.g., traditional grain/forage monocultures).
Main objective	To supplement marginal farm incomes, establish a stable regional revenue system, and encourage generational turnover by introducing a zero-capital alternative crop (safflower) integrated into a unified value chain.
Estimated implementation time	12–24 months (from initial local agronomic trial plot setup to the first scaled commercial harvest and contract rollout).
Required resources	Pre-existing extensive cereal machinery (standard seeders and combine harvesters), local trial plots (ideally via vocational schools), expert agronomic mentoring protocols, and access to an oil seed crushing facility.
Main stakeholders needed	Primary producers/farmers, vocational agricultural schools or universities, regional development consortia (GAL), agricultural trade unions, and bio-based processing SMEs/off-takers.
Main risks	Fragmented communication or administrative strain within the local coordination consortium as the network expands; early cultural scepticism or risk-aversion from traditional growers.
Cost intensity	Low (Leverages pre-existing local infrastructures, public school testing grounds, and standard farming equipment, avoiding heavy capital expenditures).
Technical complexity	Medium (Standard cereal cultivation mechanics are used, but strict adherence to specific weed control calendars, pest management, and certified chemical profiling is required).
Stakeholder engagement intensity	High (Success depends entirely on structural trust-building, cross-sector coordination, and activating active grassroots word-of-mouth (passaparola) through local trade unions).

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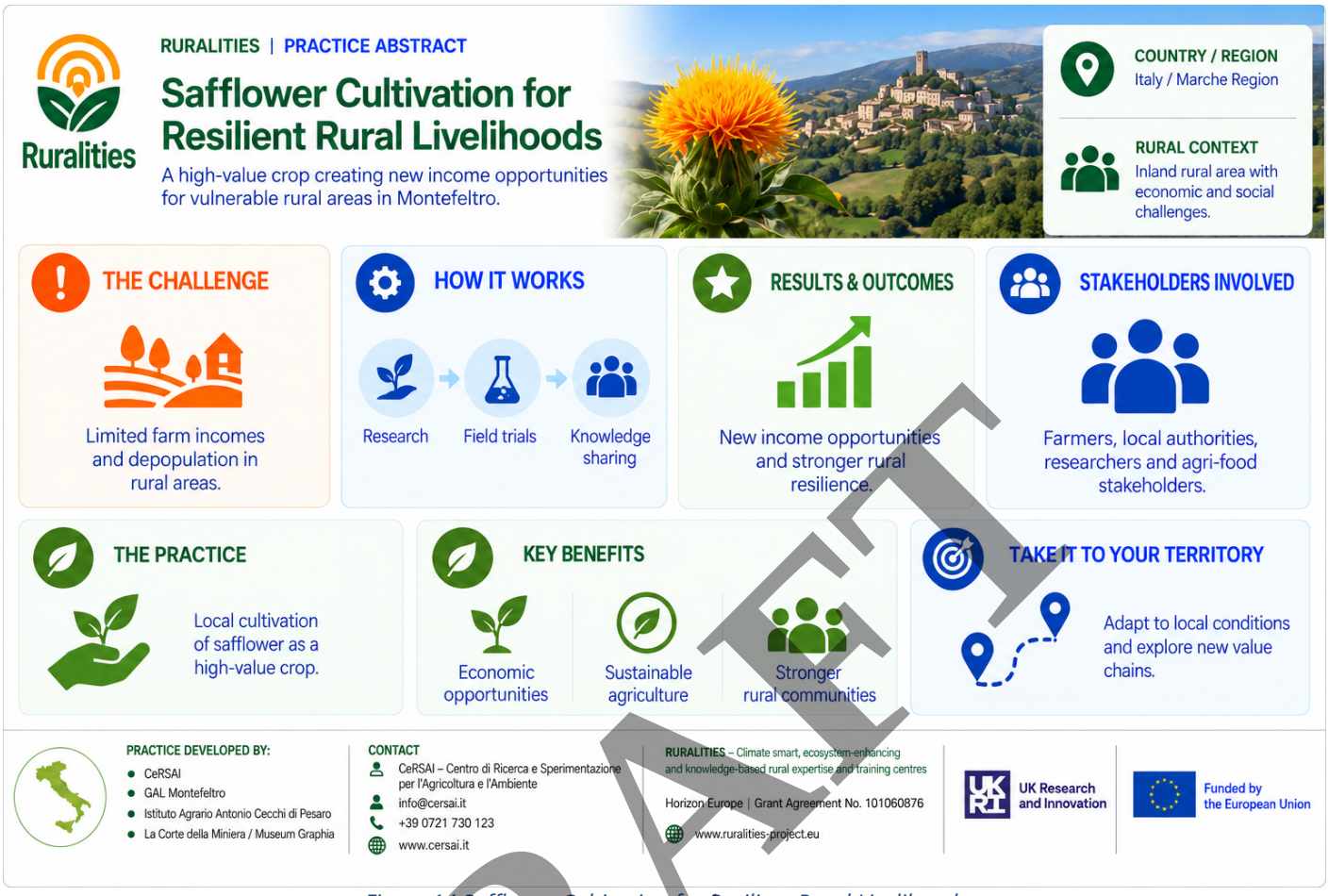


Figure 14 Safflower Cultivation for Resilient Rural Livelihoods

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2.7 RoRuralia Living & Policy Lab and ARCA: Connecting Territorial Needs with Research, Training and Rural Innovation Support (RDRP)

TERRITORIAL CONTEXT

Country / Region	Romania / Iasi Region
SIMSES	SIMSES 6, Romania
Rural context	The Siret–Moldova LAG covers 339.28 km², seven communes and 35 rural settlements, with a population of 33,790. Agriculture is the predominant activity, with vineyards, fruit-growing, wine production and fruit processing among the territorial assets. The territory also faces ageing, youth outmigration, limited entrepreneurship and services, soil erosion, groundwater pollution and climate risks such as hailstorms.

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Main challenges addressed

- Fragmented cooperation between rural communities, knowledge providers, public authorities and business-support actors.
- Limited capacity to convert local resources and ideas into sustainable projects, enterprises and value chains.
- Need for accessible knowledge, youth engagement, climate-smart practices and stronger policy dialogue.

Main stakeholders involved

- RDRP / RoRuralia Living & Policy Lab.
- ARCA – Advanced Research Centre for Agribusiness within USV Iași.
- Siret–Moldova Local Action Group and the seven municipalities in its territory.
- YXS Avalana, farmers, producers, rural SMEs, schools, students, NGOs and community initiatives.
- Food for Iași Living Lab, Cities2030, LEADER and TWIN-IN synergy actors.
- RURALITIES partners, researchers, facilitators and policy stakeholders participating in knowledge exchange.

CHALLENGE

Problem Description

The Siret–Moldova territory has active local organisations and valuable agri-food, natural and cultural resources, but knowledge, funding, research, local governance and entrepreneurial support are often accessed through separate channels. Rural actors may have a strong idea or urgent need without knowing which institution can provide technical validation, funding guidance, partners or visibility.

This fragmentation is reinforced by demographic ageing and migration, uneven access to specialist training and digital tools, and the limited time and capacity of small farms, micro-enterprises and municipalities. A mechanism was therefore needed to connect territorial knowledge with academic expertise, participatory governance and practical business support.

Why Was This Important?

RoRuralia provides the stable Living Lab and Policy Lab interface, while ARCA provides the formal research, expertise and training anchor. Together with the LAG and YXS Avalana, the model connects local problems with co-creation, scientific validation, learning, project development and policy dialogue.

Target Groups Affected

- Farmers, producers and rural SMEs: clearer access to knowledge, networks, finance and market-oriented support.
- Youth, students and schools: practical exposure to rural innovation, entrepreneurship and community futures.
- Municipalities, the GAL and civil society: structured stakeholder engagement and better evidence for local development decisions.

PRACTICE DESCRIPTION

Main Activities Implemented

Living Lab establishment: RoRuralia was created in 2023 as the SIMSES 6 collaborative hub, integrated into the RDRP Knowledge Ecosystem and linked with Food for Iași Living Lab.

Knowledge infrastructure: three operational research dimensions were organised around Agri-Economy Systems, Rural Anthropology and Knowledge Transfer, supported by the RoRuralia digital platform.

Multi-actor engagement: workshops in the Siret–Moldova territory, the international RURALITIES conference in Iași (15–18 May 2024), and the SIMSES-RO workshop of 25 February 2026 connected research, LEADER, local authorities, business and community actors.

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Methodology / Approach Used

The practice uses systems thinking, Living Lab co-creation, the quadruple-helix model and participatory governance. Activities begin with local needs and stakeholder knowledge, connect these with research and business expertise, and convert the results into workshops, online resources, project synergies, policy messages and follow-up actions.

Tools or Resources Used

- RoRuralia digital platform and stakeholder community.
- Workshops, conferences, consultation formats and stakeholder mapping.
- RDRP Knowledge Ecosystem, Food for Iași Living Lab and RURALITIES partner networks.
- ARCA's three-department expertise and facilities, nine mapped USV Iași learning provisions, LAG/LEADER animation channels and YXS Avalana funding and business-development expertise.
- Reusable tools tested in RDRP projects include the GUST+ stakeholder database and interactive platform, semi-structured interviews, consultation reports and public food forums; a school-workshop, farm-visit and teacher-webinar learning sequence; participatory heritage inventorying using interviews, cultural maps, photographs, video and digital dissemination; producer-facing digital platforms; farm visits and co-creation; short-food-chain cooperation; and applied modules on certification, trademarks, branding, marketing and access to finance.

Timeline

- 2023: establishment of RoRuralia and first working session at Siret–Moldova LAG (30 October 2023).
- 2024: international RURALITIES Conference in Iași (15–18 May) and continued knowledge, research and dissemination activities.
- 2025: consolidation of RoRuralia synergies, research and communication functions and mapping of relevant USV Iași learning resources.
- February 2026: SIMSES-RO workshop linking LEADER, RURALITIES and TWIN-IN through participatory sustainability actions.
- 2026–2027: transition from Living Lab coordination into operational Expertise and Training Centre services anchored in ARCA at USV Iași.

Organisations Involved

- Rural Development Research Platform Association – scientific and Living Lab coordination.
- ARCA / University of Life Sciences of Iași – formal research, expertise and training host.
- Siret–Moldova Local Action Group – territorial governance and stakeholder mobilisation.
- YXS Avalana – innovation brokerage, finance and business support.
- Local authorities, producers, schools, civil society, RURALITIES partners and cross-project synergy actors.

CONDITIONS FOR SUCCESS

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Key Success Factors

- A trusted double anchor: RoRuralia is embedded in RDRP's regional knowledge ecosystem, while ARCA provides a formal university research and transfer structure connected to the LAG territory.
- Complementary partner roles: science, facilitation, territorial mobilisation and business support are clearly separated but coordinated.
- Repeated engagement: workshops, digital communication and follow-up relationships maintain continuity beyond isolated consultations.

Resources Required

- Human resources: Living Lab facilitators, researchers, trainers, GAL mobilisers, communication staff and business/funding advisers.
- Financial resources: limited coordination, travel, event, communication and follow-up budgets; extensive reuse of partner infrastructure.
- Technical resources: RoRuralia and RDRP websites, stakeholder and survey records, ARCA offices B63, B64 and B73, laboratory B56 and accessible digital collaboration tools.
- Organisational resources: a shared calendar, partner roles, evidence register, consent/communication procedures and monitoring templates.

Important Preconditions

The model requires a credible local coordinator, territorial access, a formal knowledge and training host, practical follow-up capacity and agreement on evidence management. ARCA supplies the institutional anchor; trust and continuity are maintained through RoRuralia and the LAG network.

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REPLICATION GUIDANCE

Suggested Replication Steps

1. Map the territory and existing networks - Identify local challenges, assets, stakeholder categories, trusted intermediaries and active projects before defining new services.

2. Form a complementary core partnership - Combine a formal knowledge and transfer institution such as ARCA, a territorial governance actor, a Living Lab/facilitation organisation and a practical business or finance-support actor.

3. Create a light Living Lab operating system - Agree roles, decision rules, a contact map, a recurring engagement calendar, evidence templates and simple feedback mechanisms.

4. Start with visible, useful joint actions - Use a workshop, demonstration, clinic or local challenge to show immediate value and build a shared agenda.

5. Convert activity into durable services - Document lessons, publish accessible materials, create referrals, link training with expertise and integrate results into local policy and future projects.

Lessons Learned

- A Living Lab gains credibility when stakeholders see that their contribution changes the next action. Digital visibility helps, but territorial mobilisation and direct follow-up remain essential.
- Cross-project synergies are most useful when they share concrete methods, audiences or activities. The LEADER–RURALITIES–TWIN-IN link in SIMSES 6 demonstrates how local, national and European mechanisms can be discussed within one territorial process.

Common Risks or Barriers

- Limited coordination time, stakeholder fatigue, fragmented monitoring data, overly academic communication and weak follow-up after events.

Suggested Mitigation Measures

- Use a narrow annual plan, trusted local channels, plain-language materials, hybrid access, named action owners and one shared evidence register. Reuse partner facilities and existing networks to keep costs low.

RESULTS AND OUTCOMES

Main Results

- RoRuralia Living & Policy Lab operational since 2023 and publicly accessible through a dedicated digital platform.
- A four-organisation SIMSES 6 partnership connecting RDRP, ARCA / USV Iași, Siret–Moldova LAG and YXS Avalana, supported by cross-project synergies, three ARCA departments and nine mapped learning provisions.
- RDRP's documented 2021–2025 implementation portfolio demonstrates that the hub model can progress from stakeholder mapping and consultation to practical learning, producer cooperation, farm-based exchange, digital tools, policy reporting and community-based knowledge transfer. These results are used as organisational capacity evidence and are not added to the RURALITIES M44 indicators unless the consortium confirms that the relevant activities fall within the agreed SIMSES reporting boundary.

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Quantitative Indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

Indicator	Result
Stakeholders mapped in the RoRuralia network	164 stakeholder records (RDRP/RoRuralia internal stakeholder list)
Major documented SIMSES/RURALITIES multi-actor events	3: 30 Oct 2023; 15–18 May 2024; 25 Feb 2026
Existing USV Iași learning provisions mapped for SIMSES 6	9 live higher-education provisions relevant to the Training Centre
Regional graduate evidence analysed for Training Centre design	5,246 responses; 4,573 from the North-East Region; 36.1% interest in an incubator or entrepreneurial-support pathway (Aviz USV SIMSES6 dashboard).
RDRP agri-food governance delivery demonstrated through GUST+ (2025)	At least 30 actors mapped; 3 civic food forums with approximately 90 participants; 3 consultation reports plus 1 integrated synthesis; at least 30 expressions of interest in cluster participation; 1 strategic report delivered to 5 public institutions; redesigned public platform with at least 3 new functions and a reported minimum of 500 visitors during implementation (final technical report).
RDRP food-education delivery demonstrated through the 2025 children's project	5 school workshops; 3 practical farm visits; 1 teacher webinar; 1 educational guide developed, printed and distributed; supporting feedback, field documentation and online awareness activities (final activity report).

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Observed Impacts

The main observed impact is a more connected regional interface for rural innovation. Local needs can move through the LAG and RoRuralia network towards ARCA research and training, project development, funding orientation and policy dialogue, while university knowledge reaches rural users through practical collaboration.

ADDED VALUE FOR TARGET GROUPS

Target Group	Added Value
Farmers	Access to practical university knowledge, sustainable-production guidance, funding orientation, peers and project-development support.
Municipalities	Structured stakeholder evidence, stronger LEADER links and a trusted channel for policy dialogue and regional cooperation.
SMEs	Business and investment brokerage, market and value-chain connections, training referrals and greater visibility for local solutions.
Youth	Exposure to rural careers, entrepreneurship, agri-food innovation, research and community problem-solving through ARCA / USV Iași and Living Lab activities.
Women entrepreneurs	Targeted access to finance, mentoring, digital and marketing skills, and inclusion in institutional and business networks.
NGOs	A participatory framework for co-creation, communication, citizen engagement and transfer of community-led practices.
Policymakers	Place-based evidence and a repeatable model linking local needs with science, education, finance and rural-development instruments.

DRAFT

TRANSFERABILITY POTENTIAL

Transferability Level

- High: the model relies on roles, networks and repeatable methods rather than territory-specific infrastructure.

Easily Replicable Elements

- Quadruple-helix stakeholder mapping and a small complementary core partnership.
- A combined Living Lab and Policy Lab approach with:
  - A digital hub for visibility, resources and documentation.
  - A recurring cycle of consultation, knowledge transfer, demonstration, brokerage and policy dialogue.

Elements Requiring Adaptation

- Thematic priorities, language, partner mix, data governance, engagement channels and training offer must be adapted to local needs. Territories without a university can use a vocational school, research institute or extension service as the knowledge anchor.

Suitable Types of Territories

- LAG territories and other areas with an established local public-private partnership.
- Remote or demographically vulnerable rural areas needing stronger access to knowledge, finance and networks.
- Agricultural and agri-food regions seeking to connect sustainable production, entrepreneurship, tourism, heritage and participatory governance.

REPLICATION BOX

Aspect	Information
Recommended for	LAG territories, remote rural areas, agricultural regions and places with fragmented access to knowledge, finance and innovation support.
Main objective	Create a durable multi-actor interface that converts rural needs into knowledge, training, partnerships, fundable ideas and policy evidence.
Estimated implementation time	6–12 months for partnership setup and first service cycle; 18–24 months for a stable recurring programme.
Required resources	Part-time coordinator, host institution, stakeholder map, digital hub, meeting/training facilities, facilitators, trainers and referral partners.
Main stakeholders needed	Knowledge institution, LAG/local authorities, Living Lab or civil-society coordinator, business/funding support, farmers, SMEs, youth and NGOs.
Main risks	Fragmented coordination, stakeholder fatigue, incomplete monitoring, weak follow-up and services that are not sufficiently practical.
Cost intensity	Low–medium: the model reuses existing facilities and networks; costs relate mainly to coordination, travel, activities and communication.
Technical complexity	Medium: the digital tools are simple, but facilitation, evidence management, partner alignment and service design require skilled coordination.
Stakeholder engagement intensity	High: success depends on trusted territorial mobilisation, recurring participation and visible follow-up to stakeholder contributions.

DRAFT

CONTACT

Organisation: Rural Development Research Platform Association (RDRP) / RoRuralia Living & Policy Lab
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Figure 15 RoRuralia Living and Policy Lab and ARCA

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2.8 Landscape Architecture Students for the Countryside (UNIM)

TERRITORIAL CONTEXT

Country / Region	Hungary / Veszprém County
SIMSES	**SIMSES Follower, UNIM**
Rural context	The study area — Kapolcs, Taliándörögd, Vigántpetend, Halimba, Szőc, Pula and Öcs — is in Veszprém County. It is predominantly characterised by a network of small and very small villages, rich natural assets, and a partly peripheral position. The area consists of settlements with low population numbers, where community life is relatively active, especially in Kapolcs and Taliándörögd, where civil organisations and cultural initiatives are strong. The Valley of Arts Festival is a significant factor in shaping local identity and strengthening community cohesion. The local economy is based mainly on small-scale activities, typically micro-enterprises. Agriculture remains important in several settlements, such as Pula and Szőc, while in Kapolcs tourism and the creative industries are more dominant. Employment indicators are improving, and unemployment shows a decreasing trend. The natural environment of the area is outstanding: it is a wooded, hilly landscape with important watercourses and traditional forms of land use. The increase in forest areas and the presence of landscape values are important resources. At the same time, water management and adaptation to climate change are key issues.

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Main Challenges

- Peripheral location and limited accessibility
- Weakness of the economic structure
- Uneven infrastructure provision
- Difficulties in retaining the population

Main Stakeholders Involved

- Municipalities of the participating settlements
- Local residents and farmers
- Local SMEs and entrepreneurs, including Ilona Malom Műhely and Halimbárium
- NGOs and community organisations, including Tájkapocs Foundation and KÖSZI
- Éltető Balaton-felvidék LEADER Association
- Balaton Uplands National Park Directorate
- Hungarian University of Agriculture and Life Sciences / UNIM teachers and students

- Local heritage and cultural actors

The preparatory meeting already established cooperation between university partners, local development organisations and municipal stakeholders, and identified local actors to be involved in the forthcoming field visits and workshop activities.

CHALLENGE

The Dörögd Basin has significant landscape, cultural and community assets, but these resources are fragmented and not always connected to long-term rural development strategies. The area faces typical challenges of small rural settlements: peripheral location, limited accessibility, weak economic structure, uneven infrastructure, and difficulties in retaining population.

There was a need to explore how landscape heritage, local identity, agriculture, tourism, community initiatives and local entrepreneurship could be connected in an integrated development framework. Local stakeholders also needed a platform where they could discuss development opportunities with university experts and students in a practical, place-based way.

This was important because many local values — such as historic village structures, traditional land use, old cemeteries, geological features, former mining areas, water-management heritage, wooded pastures and innovative local enterprises — can support rural resilience if they are recognised, mapped and connected to feasible development ideas.

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Target groups affected

- Local municipalities
- Rural communities and residents
- Farmers and land users
- Local SMEs and creative enterprises
- NGOs and civil initiatives
- University students
- Rural development organisations
- Tourism and heritage actors

PRACTICE DESCRIPTION

Title: Landscape Architecture Students for the Countryside

The practice connected landscape architecture students with rural communities through a sequence of field visits, stakeholder meetings, interviews, landscape surveys, participatory discussions and a two-week workshop. Students explored the cultural heritage, landscape values, environmental conditions and development challenges of the Dörögd Basin while working with local actors. As an outcome, they prepared analytical materials and proposals for landscape-based rural development.

Main Activities Implemented

- **Preparation meeting in Taliándörögd – 28 January 2026:** The meeting defined the framework of the landscape-based rural development initiative, identified potential local partners, and prepared the student workshop and field visits.
- **Field study on landscape heritage and local innovation – 25 February 2026:** Students and teachers visited Halimba, Szőc, Öcs, Pula, Taliándörögd, Kapolcs and Vigántpetend. The programme included Halimbárium, the Szőc hilltop cross, Öcs heritage sites, Pula's Esterházy Bridge and Crater Stone Park, the Saint Andrew church ruins and Ilona Malom Műhely in Kapolcs.
- **Field programme on landscape heritage and local agricultural practices – 1 April 2026:** Participants explored the restored medieval spring catchment system of the former Tálod monastery, the Négyszögletű Kerekerdő landscape landmark, a former bauxite mining area, and local agricultural practices through discussion with a farmer in Taliándörögd.
- **Two-week workshop – 4–15 May 2026:** The first week was held in Taliándörögd and focused on fieldwork, stakeholder meetings and landscape exploration. The second week was held in Budapest and focused on preparing the landscape-based rural development study.
- **Presentation and discussion of results – 22 June 2026**: Preliminary results and proposals were presented in Halimba to municipalities, local organisations, residents and development actors. Feedback was collected and integrated into the next phase of the study.

Methodology / approach used

- Field-based learning
- Landscape character and heritage analysis
- Settlement walks and site surveys
- Interviews and informal discussions with local residents
- Stakeholder meetings
- Participatory planning discussions
- Mapping and visual analysis
- Group-based student work
- Development of proposals for landscape-based rural development

Tools and resources used

- Field visits and guided walks
- Local stakeholder interviews
- Maps and spatial analysis
- Student workshops
- Visual presentations
- Group discussions
- Local knowledge from residents, farmers, NGOs and entrepreneurs

Timeline: January–June 2026

Organisations involved

- Hungarian University of Agriculture and Life Sciences / UNIM

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- Éltető Balaton-felvidék LEADER Association
- Tájkapocs Foundation
- KÖSZI
- Municipalities of the Dörögd Basin
- Balaton Uplands National Park Directorate
- Ilona Malom Műhely
- Halimbárium
- Local residents, farmers and community representatives

CONDITIONS FOR SUCCESS

Key success factors

- Early involvement of local actors and development organisations
- Strong cooperation between university teachers, students and municipalities
- Direct field experience in all participating settlements
- Combination of academic knowledge and local knowledge
- Flexible organisation and continuous coordination
- Use of real local challenges as educational and planning tasks
- Informal discussions with residents, farmers and entrepreneurs

Resources required

- **Human resources:** university teachers, students, local organisers, municipal contacts, local experts
- **Organisational resources:** coordination of field visits, stakeholder meetings and workshop logistics
- **Technical resources:** maps, presentation tools, field documentation materials, transport
- **Financial resources:** travel, accommodation, catering, venue use, printing and workshop materials

Important preconditions

The practice requires a clearly defined rural territory, motivated local partners, access to local knowledge, and sufficient time for fieldwork and dialogue. Local actors should be involved from the earliest stage, as the preparatory meeting showed that early engagement is essential for long-term relevance and trust-building.

REPLICATION GUIDANCE

Step 1 – Select a rural micro-region: Choose a territory with clear landscape values, development challenges and interested local partners.

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Step 2 – Build a local stakeholder network: Contact municipalities, NGOs, LEADER groups, farmers, entrepreneurs, schools and community organisations.

Step 3 – Organise preparatory meetings: Define the main objectives, key topics, field sites, local contacts and expected outputs.

Step 4 – Carry out field visits and stakeholder interviews: Let students explore settlements, landscape heritage, land use, local economy and community initiatives through direct observation and dialogue.

Step 5 – Implement an intensive workshop: Combine fieldwork with analytical work. Students should prepare maps, thematic analyses, development concepts and proposals.

Step 6 – Present results locally: Return to the territory and discuss preliminary findings with local stakeholders. Collect feedback and revise the study.

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Lessons learned

- Informal local conversations often generate the most valuable insights.
- Students need enough time for reflection, not only for field visits.
- Local knowledge should be treated as a core planning resource.
- Visual presentations help translate academic concepts into practical discussion.
- Development proposals become stronger when municipalities, NGOs and residents validate them together.

Common risks or barriers

- Too many settlements or topics within a limited timeframe
- Uneven participation among local stakeholders
- Difficulty translating academic analysis into practical proposals
- Conflicting development priorities among settlements
- Logistical challenges during fieldwork

Suggested mitigation measures

- Prepare a realistic timetable
- Use small working groups
- Involve local coordinators
- Keep outputs practical and visual
- Allow time for open discussion
- Validate results with stakeholders before finalisation

RESULTS AND OUTCOMES

Main Results

A collaborative landscape-based rural development process was launched in the Dörögd Basin.

- University students gained practical experience in field research, landscape analysis and participatory planning.
- Local stakeholders contributed knowledge on heritage, tourism, agriculture, landscape management and community development.
- Initial concepts and analytical materials were prepared for a landscape-based rural development study.
- The preliminary results were presented and validated with local stakeholders in Halimba.
- Cooperation between the university, municipalities, NGOs and local actors was strengthened

Quantitative Indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

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Indicator	Result
Number of reported events	5
Preparation meetings	1
Field study visits	2
Two-week student workshop	1
Result presentation / validation workshop	1
Total participants across reported events	approx. 55
Students involved in the two-week workshop	27
Settlements covered	7
Main local stakeholder groups engaged	municipalities, NGOs, LEADER, SMEs, farmers, residents, national park experts

The practice improved dialogue between higher education and local communities. It helped students understand real rural development challenges and helped local stakeholders see their landscape values, heritage assets and development opportunities from a new perspective. The final discussion confirmed local interest in landscape heritage protection, sustainable tourism, community development, climate adaptation and stronger cooperation among settlements.

Funded by the European Union
UKRI Innovate UK

ADDED VALUE FOR TARGET GROUPS

Target Group	Added Value
Farmers	Farmers and land users: Opportunity to share local knowledge and highlight land-management challenges
Municipalities	Practical development ideas, external expertise, stronger cooperation with university and neighbouring settlements
SMEs and entrepreneurs	Visibility for innovative rural businesses, such as Ilona Malom Műhely
Youth	Exposure to rural careers, entrepreneurship, agri-food innovation, research and community problem-solving through ARCA / USV Iași and Living Lab activities.
Women entrepreneurs	Targeted access to finance, mentoring, digital and marketing skills, and inclusion in institutional and business networks.
NGOs and community organisations	Stronger role in participatory planning and local identity-building
Policymakers and development organisations	Transferable model for connecting education, local knowledge and rural development
Tourism actors	New ideas for heritage-based and landscape-based tourism development
Local residents	Opportunity to express local values, concerns and priorities
Students	Practical field experience, stakeholder communication skills, interdisciplinary planning practice

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TRANSFERABILITY POTENTIAL

Transferability Level

Medium

Easily Replicable Elements

- Preparatory stakeholder meeting
- Student field visits
- Settlement walks and interviews
- Participatory workshop format
- Local result presentation
- Landscape-based rural development study

Elements Requiring Adaptation

- Selection of local themes
- Duration of fieldwork
- Stakeholder composition
- Transport and accommodation logistics
- Local planning framework
- Available data and maps

Suitable Types of Territories

- Small-village rural areas
- Peripheral or semi-peripheral rural regions
- Cultural landscapes
- Areas with strong landscape heritage
- Regions with active NGOs and local initiatives
- Agricultural and mixed land-use regions
- Rural areas seeking tourism and heritage-based development

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REPLICATION BOX

Aspect	Information
Recommended for	Rural municipalities, Living Labs, universities, NGOs, LEADER groups, regional development organisations
Main objective	To connect university field education with local rural development needs through landscape-based participatory planning
Estimated implementation time	3–6 months including preparation, field visits, workshop and result validation
Required resources	University staff, students, local coordinators, venues, transport, maps, workshop materials
Main stakeholders needed	Municipalities, residents, farmers, SMEs, NGOs, local development organisations, schools or universities
Main risks	Weak local engagement, limited time, too broad thematic scope, difficult logistics, conflicting priorities
Cost intensity	Medium
Technical complexity	Medium
Stakeholder engagement intensity	High

CONTACT

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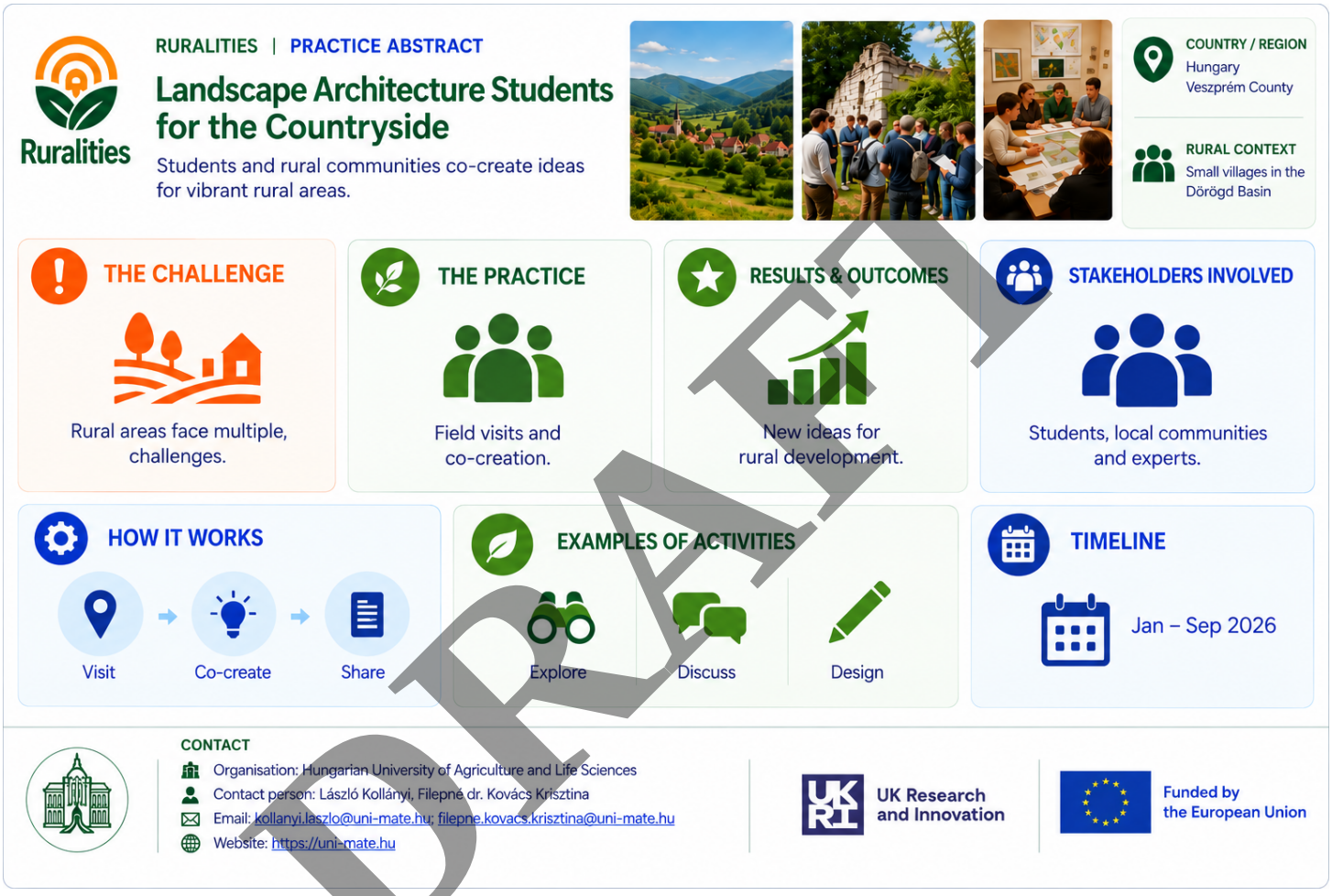


Figure 16 Landscape Architecture Students for the Countryside

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2.9 Farm Experience Calendar: Structurally Integrating Engaging Farm Activities into Rural Tourism (INAG)

TERRITORIAL CONTEXT

Country / Region	Belgium / Province of West Flanders (Brugse Ommeland, Coast, Leiestreek, Westhoek)
SIMSES	SIMSES Follower INAGRO
Rural context	West Flanders is a predominantly agricultural region shaped by family farms, horticultural businesses and short supply chains. Although agriculture is highly visible, many farm-based experiences remain fragmented or hidden from visitors. Tourism in the region increasingly seeks authenticity, yet visitors often struggle to access meaningful encounters with farmers and their daily work.

Main Challenges Addressed

- Limited visibility of farm-based experiences for tourists and residents
- Weak connection between citizens and the origins of their food
- Farmers are looking for new business models

Main Stakeholders Involved

- Farmers, more specific visiting farms
- Inagro (agricultural knowledge and advice centre)
- Regional tourism organisation Westtoer
- municipalities and local tourism offices
- SMEs in food, hospitality and rural experiences
- Families and local residents

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CHALLENGE / NEED ADDRESSED

Problem Description

In West Flanders, many farms offer rich, authentic visits and experiences for schools and larger groups, but these remain low accessible for individual visitors. Visitors and residents are increasingly looking for meaningful ways to connect with rural life, yet they struggle to find accessible, reliable information and last-minute access about farm-based activities. At the same time, farmers who are willing to open their doors often lack a coordinated platform to present their offer, resulting in fragmented visibility and low attendance. This disconnects limits opportunities for rural tourism, reduces public understanding of modern farming, and prevents farmers from diversifying their income through visitor activities. Although agriculture is omnipresent in the region, the everyday reality of farming remains distant for most citizens.

Why Was This Important?

Addressing this challenge was essential to strengthen the link between agriculture and society. Visitors increasingly seek authenticity, but without clear access points, farms remain overlooked. A coordinated intervention was needed to make rural experiences visible, to support farmers in welcoming visitors, and to help citizens rediscover where their food comes from. By structuring and promoting farm activities, the initiative enhances rural tourism, supports farm diversification, and fosters appreciation for agricultural work.

Target Groups Affected

- Visitors and tourists seeking authentic rural experiences
- Local residents and families looking for educational and meaningful activities
- Farmers interested in diversification and public engagement
- Municipal tourism offices and regional tourism actors

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PRACTICE DESCRIPTION

Main Activities Implemented

- Collecting and selecting farm activities: Farms across West Flanders were contacted, their ideas inventoried, and activities refined into visitor-friendly experiences.
- Structuring the calendar into clear categories: Activities were grouped into “Behind the scenes”, “Behind the scenes with food”, and “Hands-on experiences”.
- Coordinated promotion across tourism networks: A regional communication campaign was launched using websites, social media, printed materials, and municipal tourism channels.
- Supporting participating farms: Farms received guidance on visitor expectations, registration management, and quality criteria, plus a small financial compensation.
- Implementing and following up visits: Activities were carried out during summer months, with monitoring of attendance, quality, and visitor feedback.

Methodology / Approach Used

The approach combined agricultural expertise with tourism promotion. Inagro coordinated the process by identifying willing farms, refining activities, and ensuring quality standards. Westtoer and municipal tourism offices integrated the calendar into their communication channels to reach both residents and tourists. The methodology emphasised simplicity: farms manage registrations and payments themselves, while the central team ensures coherence, visibility, and support. Activities were designed to be authentic, family-friendly, and interactive, with clear expectations communicated to visitors.

Funded by the European Union
UKRI Innovate UK

Tools or Resources Used

- Inagro's existing "Proef de boerderij" visitor farm network
- Regional tourism websites and communication platforms
- Social media campaigns (Facebook)
- Printed promotional cards for municipalities and tourist services
- Email banners
- On-farm infrastructure (signage, safe walking routes, parking)

Timeline

Implementation period: **4–6 months**

- Concept definition and partner coordination: January–February
- Call for participating farms: March
- Activity selection and refinement: April
- Communication preparation and launch: May–June
- Visitor activities: mid-June to late August
- Evaluation with partners: September

Organisations Involved

- Inagro – coordination, quality assurance, farm support
- Westtoer – regional tourism promotion
- Municipal tourism offices – local promotion and visitor information
- Participating farms – activity development, registrations, hosting visitors
- Regional tourism networks – dissemination and visibility

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CONDITIONS FOR SUCCESS

Key Success Factors

- Strong collaboration between agriculture and tourism
- Authentic, family-friendly and interactive activities
- Clear structure and expectations for participating farms
- Multi-channel communication strategy
- Motivated and welcoming farmers

Resources Required

- **Human resources** – Coordination team at Inagro – Communication staff (Inagro + Westtoer) – Farmers hosting and guiding visitors – Municipal tourism staff promoting activities
- **Financial resources** – Modest budget for communication materials – Small compensation for participating farms (€100 per visit) – Staff time for coordination and promotion

- **Technical resources** – Regional tourism websites and social media channels – Registration tools managed by farms – On-farm infrastructure (parking, signage, safe walking routes)
- **Organisational resources** – Existing visitor farm network ("Proef de boerderij") – Partnerships with tourism actors – Clear quality criteria and activity guidelines - an Efficient and straightforward administrative process

Important Preconditions

- A network of farms willing to host visitors
- A coordinating organisation
- Tourism partners ready to promote the programme
- Clear activity criteria and child-friendly guidelines
- A realistic timeline

REPLICATION GUIDANCE

Suggested Replication Steps

Step 1: Define the concept (content/period/support farmers) and check whether any adjustments to another context are needed + communication strategy & partners

Step 2: Call for applications

Step 3: Compilation of calendar

Step 4: Preparing and disseminating communication (with touristic partners)

Step 5: Follow-up visits (communication, number, quality, photos)

Step 6: Evaluation with partners

Lessons Learned

The evaluation of the previous edition (2025) revealed several insights.

- **Diversity matters**: offering a wide range of activities ensures that different audiences find something that appeals to them. Family-friendly experiences are especially powerful, drawing in visitors who might not otherwise engage with agriculture.
- **Interactive elements significantly increase engagement**, especially for families. Activities where visitors can "do something themselves" - picking fruit, collecting eggs, decorating ice pops, caring for animals - create memorable experiences and deepen appreciation for farm work. The ideal formula combines a guided tour, a tasting, and a hands-on activity.
- **Pricing also plays a role**: Most activities ranged between 5 and 15 euros per person, with an average of around 10 euros — a price point that works well for families. Higher prices are acceptable for niche or luxury products such as wine or beer.

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- **Timing matters**: The period from mid-June to late August works best, while conflicts with major events such as communions or the start of the school year should be avoided. Many visitors, like tourists, appreciate the calendar as a last-minute option, making flexible registration essential.
- **Simple and clear collaboration structure between farmers, Inagro and touristic partners:** the visits take place in holiday periods. The more each partner can work autonomously, the better. So, inscriptions and payments are managed by the farmers themselves.

Common Risks or Barriers

- Low visibility if tourism partners are not fully engaged
- Weak visitor turnout when farms do not promote activities through their own channels

Suggested Mitigation Measures

- Establish clear agreements with tourism partners early in the process
- Provide farms with communication templates and practical promotion tips
- Offer small financial compensation to reduce last-minute cancellation due to low numbers of registrations
- Set strict deadlines for date confirmation to allow timely promotion
- Conduct a basic infrastructure check and offer guidance for improvements

RESULTS AND OUTCOMES

Main Results

- A coordinated and visible summer programme showcasing authentic farm experiences across West Flanders
- Strengthened collaboration between agriculture and tourism actors (Inagro, Westtoer, municipalities, farms)
- Increased public understanding of farming, food origins and rural craftsmanship
- New income opportunities and diversification pathways for participating farms
- Higher confidence among farmers to host visitors and engage with the public
- Visiting offer aimed at a target group we find difficult to reach (individuals)

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Quantitative Indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

Indicator	Result
Number of participants	468 visitors (edition 2025)
Number of workshops	19 activities (2025) / 20 activities (2026)
Number of stakeholders engaged	± 80 visitor farms contacted; 20 farms selected; regional + municipal tourism partners involved

Observed Impacts

The Farm Experience Calendar has increased visibility of rural experiences and positioned farm visits as a recognised part of regional tourism. Visitors report a deeper appreciation for agricultural work and a clearer understanding of where their food comes from. Families especially value the interactive, child-friendly nature of the activities. Farmers benefit from new revenue streams, stronger local networks and improved confidence in welcoming visitors. Tourism actors gain a structured, high-quality offer that enriches the region's identity. Overall, the initiative strengthens the connection between citizens and agriculture through simple, well-coordinated actions.

ADDED VALUE FOR TARGET GROUPS

Target Group	Added Value
Farmers	Increased visibility, new income opportunities through diversification, stronger profiling of farmers as tourism entrepreneurs, stronger connection with citizens, and practical support for hosting high-quality visitor activities.
Municipalities	A family-friendly, accessible tourism offer that strengthens local identity and rural cohesion and attracts visitors during the summer period.
SMEs	Additional visitor flows benefiting local hospitality, short-chain retailers, and rural tourism businesses; opportunities for collaboration with farms; valorizing a broader range of talents and skills, often for rural women.
Youth	Educational, hands-on experiences that build understanding of food production, agricultural careers, and sustainability.

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TRANSFERABILITY POTENTIAL

Transferability Level

- High

Easily Replicable Elements

- Simple calendar format
- Clear activity categories
- Collaboration between farms and tourism actors
- Multi-channel communication
- Child-friendly, hands-on experiences

Elements Requiring Adaptation

- Branding and communication style
- Availability of farms with basic visitor infrastructure
- Pricing adapted to local context

Suitable Types of Territories

- Agricultural and rural areas

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REPLICATION BOX

Aspect	Information
Recommended for	Rural regions with active farms and tourism actors
Main objective	Make farm experiences visible, accessible, and family-friendly through a coordinated summer calendar
Estimated implementation time	4-6 months
Required resources	Basic coordination team, communication budget, motivated farms, tourism partners
Main stakeholders needed	Farms, agricultural support organisations, regional & municipal tourism offices
Main risks	Low farm participation, weak promotion, insufficient visitor infrastructure
Cost intensity	Low / Medium
Technical complexity	Low
Stakeholder engagement intensity	Medium / High

CONTACT

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www.proefdeboerderij.be
www.westtoer.be

Campaign material

Have a look at all our campaign material: Farm experience calendar - campaign material



Figure 17 Farm Experience Calendar

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Quotes

"People were genuinely interested in what we do – from chicken to egg, straight from the field. You can tell they appreciate getting that insight, in all its honesty and simplicity. For us, it's second nature, but for many it's a real experience. And that's exactly why we're keen to take part in the experience calendar: to show what 'local' really means."

Deborah Sanctorum, Farm shop 't Omloophof

"We often buy their cheese at the farmers' market on the coast. It's brilliant that we can explore this production process with our kids. Lyn, the cheesemaker, is so dedicated and passionate."

Marc and Ingrid, tourists

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2.10 School@Platteland: Outdoor Learning on The Farm (INAG)

TERRITORIAL CONTEXT

Country / Region	Belgium / West Flanders
SIMSES	West Flanders, Belgium
Rural context	West Flanders is a densely populated rural and peri-urban region with a strong agricultural and horticultural sector. Many schools are located close to farms, yet children often have limited direct contact with food production. Through educational innovation, educational partners are seeking to help children's wide-ranging talents develop more fully. The outdoor education approach is designed to support this. This creates opportunities for farm-based learning, dialogue and rural innovation.

Description
School@Platteland connects schools and farms through repeated outdoor learning (Figure 17). Pupils regularly visit the same farm or outdoor location, take part in meaningful tasks and learn curriculum content through direct experience. The practice combines agricultural education, environmental learning and personal and social development. It strengthens dialogue between young people and farmers and helps teachers use the farm as a rich learning environment.

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Main challenges addressed

- Growing gap between farmers and society because lack of direct contact
- More support for local food production
- Richer and more practical learning environments for schools
- Strengthening sustainable entrepreneurship and inclusion for farmers, particularly women.
- Diversification of agriculture through the development of farmers talents

Main stakeholders involved

- Schools and teachers
- Pupils, mainly upper primary pupils around 10 to 12 years old
- Farmers with visit and didactic experiences
- Inagro / agricultural education service
- VIVES University of Applied Sciences / teacher training & education innovation expertise
- Parents, local communities and supporting public partners

CHALLENGE

Problem description

Many pupils consume food every day but have little understanding of where food comes from, how it is produced and who produces it. A single farm visit can be a valuable first introduction, but it often leaves limited time for reflection, relationship-building and deeper learning.

Farmers also need safe and positive ways to explain their work, values and challenges to society. School@Platteland responds to both needs. It creates repeated contact between pupils and farmers, while giving teachers an authentic outdoor setting for lessons in science, mathematics, language, technology, citizenship and social skills.

Why was this important?

- It helps pupils understand local food production through real-life experience.
- It supports outdoor education as an innovative and inclusive learning method.
- It gives farmers a meaningful role as hosts, mentors and ambassadors for agriculture.
- It builds stronger links between agriculture, education and the wider rural community.

Target groups affected

- Pupils and schools
- Farmers, and more specifically, those with experience in visits and teaching
- Parents and local communities
- Rural and education organisations

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PRACTICE DESCRIPTION

Main activities implemented

- Matching a motivated school with a suitable local farm or outdoor location for a long-term collaboration
- Co-designing a repeated learning programme for ten half-day visits
- Using ready-made lesson fiches and farm tasks to connect curriculum goals with real farm life
- An active role for the farmer and the teacher during the visit
- Combining practical farm work with reflection and classroom learning before, during and after the visits.
- Providing support for farmers and teachers to guarantee quality and sustainability

Methodology / approach used

Outdoor Education combines three interconnected domains: active outdoor activities, environmental education and personal and social development. Through meaningful experiences outdoors, learners

develop a deeper understanding of themselves, their role in society, and their connection with the natural and built environment (see the chart on page 7).

School@Platteland is an illustration of outdoor education. The farm becomes the classroom. Pupils regularly return by bicycle (sustainable transport, physical training) to the same place, which creates rhythm, safety and trust. Learning is based on doing, observing, asking questions and reflecting. The approach combines three elements: active outdoor activities, environmental learning, and personal and social development.

A typical visit can mix theory and tasks. For example, pupils may calculate an area, care for calves, work in a vegetable garden, investigate growing conditions or organise tasks in small groups. The farmer and teacher often each guide a group and then switch halfway through the visit.

The supporting partners provide organisational and educational support, all brought together on a website www.schoolatplatteland.be

Although the teacher plays an active role, the school pays 150 euros per visit to the farmer. This payment compensates the farmer for the time invested and for providing a rich learning environment. Inagro offers a grant of 500 euros upon completion of a 10-week programme.

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Tools or resources used

- Online activity database with more than 100 outdoor lesson ideas and fiches, created by Highschool Vives
- Didactic manual, checklists and practical documents.
- Templates for communication with parents and the press.
- Materials and coaching for school-farm duos.
- Networking and exchange moments for farmers and teachers.
- Time for creating lessons and for supporting the farmers teachers
- A box of materials (folding rulers, ropes, weather computer, etc.) and overalls for each pupil

Timeline

- 3 months (matching, co-creating lessons, communication parents)
- 4 months (10-weeks programme, half-day visit per week)
- 2 weeks (evaluation)

CONDITIONS FOR SUCCESS

Key success factors

- A strong and motivated school-farm duo with clear expectations before starting.
- A serious screening of the long-time engagement as the visiting models asks for a start-up engagement.

- A farmer with enough didactic experience or skills.
- An enthusiastic teacher who is flexible to participate actively in a rather unknown learning environment.
- A coordinating organisation that supports matching, planning, materials and evaluation and who is supporting by problems.
- Repeated visits, because trust, connection and deeper learning grow over time.
- Good communication with parents, because they need to understand the value of outdoor learning.

Resources required

- Human resources: coordinator, farmer, teacher, school support and possibly volunteers.
- Financial resources: compensation for the farmer, materials and coordination.
- Technical resources: lesson fiches, safety information, communication templates and outdoor materials.
- Organisational resources: planning time, clear agreements and evaluation moments.

Important preconditions

The farm should be close enough to the school (max. 10 km), safe for pupils and suitable for meaningful tasks. The farmer and teacher should be motivated for a longer collaboration, because the approach is more intensive than a single visit. Parents should be informed early and clearly. Choose a suitable period with favourable growing conditions and allow for 10 consecutive visits.

REPLICATION GUIDANCE

Suggested replication steps

Step 1 - Map local opportunities: Identify farms, schools and outdoor places that are interested in long-term outdoor learning.
Step 2 - Select motivated partners: Check the expectations, time investment and practical feasibility for both school and farm.

Step 3 - Co-design the learning programme: Link real farm tasks to learning goals and choose suitable lesson fiches or activities.

Step 4 - Prepare communication and logistics: Inform parents, agree on transport, safety, timing, costs and roles.

Step 5 - Implement regular visits: Use a fixed rhythm and combine farm tasks, lesson moments and reflection.

Step 6 - Evaluate and continue: Discuss results with pupils, teacher and farmer, then decide how the partnership can continue or improve.

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Lessons learned

- Do not start without strong commitment from both farmer and teacher.
- Repeated contact is essential: pupils move from observing farming to understanding farming.
- Dialogue with farmers is as important as the practical tasks.
- Hands-on participation motivates pupils and can reveal talents that are less visible in the classroom.
- A long-term partnership gives better return for the effort invested by both school and farm.
- All those involved are convinced of the added value for pupils.
- The intensity of the commitment required from everyone and the cost are hindering the widespread expansion of paired teaching.

Common risks or barriers

- High time investment for farmers and teachers.
- Transport and cost barriers for schools.
- Parents may see outdoor learning as less important than classroom learning if not well informed.
- Not every farm is ready to host pupils repeatedly and for a more curriculum goal-based approach.

Suggested mitigation measures

- Start with a strong partnership: support for farmers and education expertise
- Use careful intake and matching before starting.
- Provide clear communication templates and an information moment for parents.
- Offer coaching, supervision, lesson materials and peer exchange for farmers and teachers.
- Start with a pilot duo and expand gradually.

RESULTS AND OUTCOMES

Main results

- A tested format for repeated farm-based outdoor learning in West Flanders.
- A stronger educational role for farms and farmers.
- A practical bridge between agricultural education and outdoor education.
- A reusable set of lesson fiches, tools and communication materials.
- More meaningful contact and understanding between pupils, farmers, schools and local communities.

Quantitative indicators

(The quantitative indicators provide a concise overview of the scale, implementation, and results of the practice. They help end users understand the practical experience behind the approach and provide useful reference points when considering its potential replication or adaptation in other contexts.)

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Indicator	Target
Length of one programme	Around 10 weeks, usually one half-day per week
Lesson resources	More than 100 outdoor lesson ideas/fiches are available online
Typical pupil age group	Mainly pupils aged about 10 to 12; materials also include fiches for younger pupils and special needs education
Number of participants / workshops	Max. 25 pupils
Number of stakeholders engaged	Schools, farms, pupils, teachers, parents, Inagro, VIVES and rural/education partners

The practice supports better understanding of agriculture and food production, stronger connection with rural environments and more appreciation for farmers.

The practice shows education innovation in rural areas. It also helps teachers work across subjects and gives farmers a recognised role in education and community building. Pupils develop broader and deeper learning experiences.

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ADDED VALUE FOR TARGET GROUPS

Target Group	Added Value
Farmers	Direct dialogue with young people, higher visibility in the community and valorisation of educational and communication skills.
Schools / teachers	A rich outdoor learning environment linked to curriculum goals and real-life experiences.
Pupils / youth	Practical, social, physical and cognitive learning; stronger understanding of food, farming, nature and themselves.
Parents	Insight into a different but purposeful way of learning, with visible engagement from children. Indirect connection with farming.
Rural communities	Stronger connection between agriculture, education and citizens.
Policymakers / support organisations	A transferable model for rural innovation, agricultural education and outdoor learning.

TRANSFERABILITY POTENTIAL

Transferability Level

- High for suitable types of territories

Easily replicable elements

- Repeated visits to the same farm or outdoor location.
- School-farm matching and coaching.
- Use of activity fiches and practical learning tasks.
- Communication templates for parents, schools and press.
- Reflection and evaluation moments.

Elements requiring adaptation

- Curriculum requirements and school calendar.
- Funding model and compensation for farms.
- Transport distances and safety rules.
- Available farm types and local outdoor locations.
- Language and cultural context.

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REPLICATION BOX

Aspect	Information
Recommended for	Regions wishing to connect agriculture, education, youth and rural communities.
Main objective	A double win by combining outdoor learning and agricultural education in the rich environment of farms.
Estimated implementation time	Preparation plus around 10 weeks of recurring visits.
Required resources	Coordinator, motivated school and farm, lesson materials, transport, communication, compensation for the host farm and evaluation time.
Main stakeholders needed	Farmers, teachers, pupils, parents, coordinating organisation, education partner and local public/rural partners.
Main risks	Too little commitment, high workload, transport/cost barriers and insufficient parent support.
Cost intensity	Medium
Technical complexity	Low
Stakeholder engagement intensity	High

CONTACT

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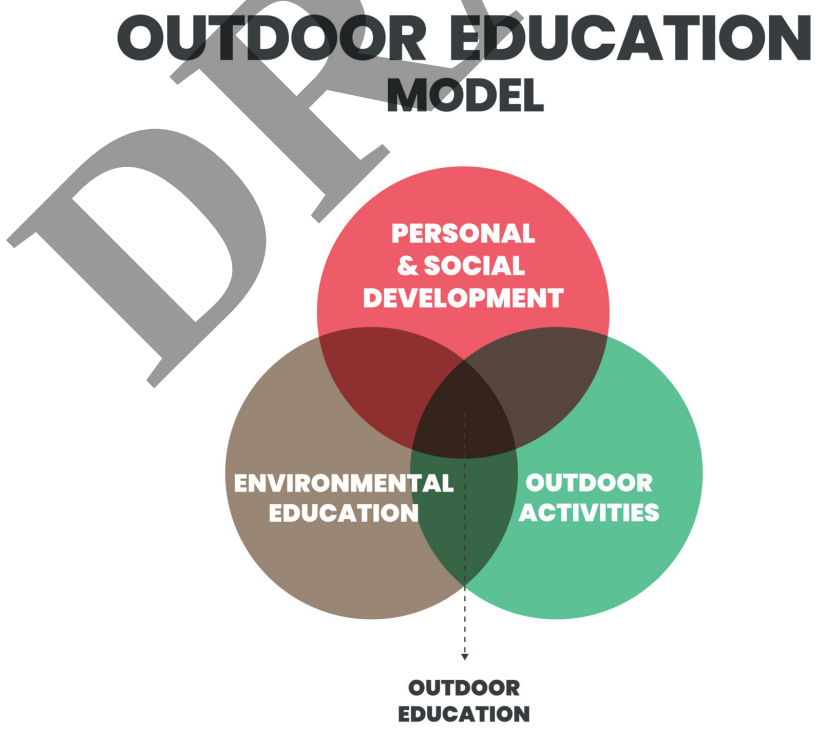


Figure 18 Outdoor Education Model

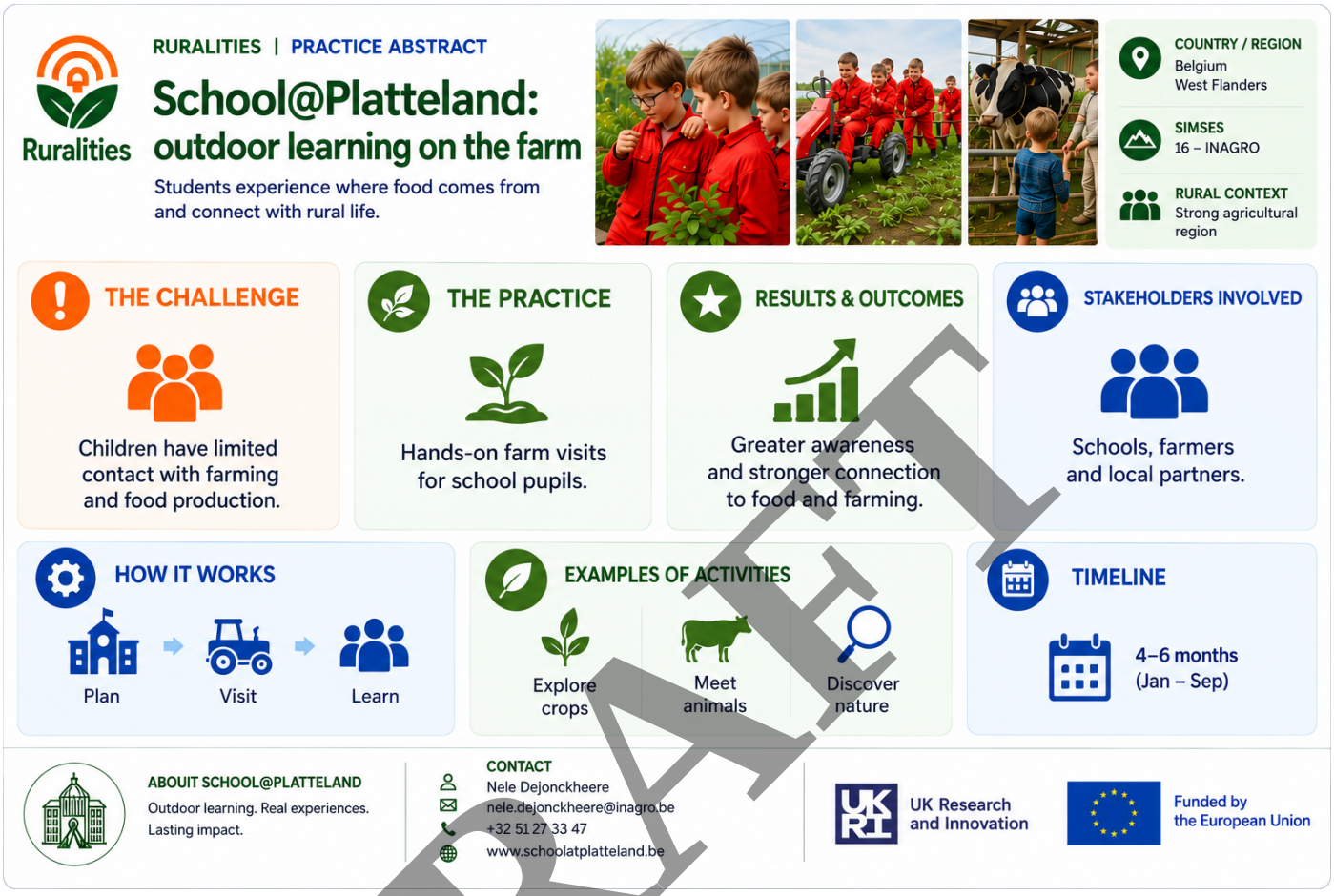


Figure 19 School @ Patteland

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3 CONCLUSIONS AND WAY FORWARD

D4.15 – Practice Abstracts – Final Version represents the second and final collection of Practice Abstracts developed within the RURALITIES project. Building upon the foundations established through Deliverable D4.14, this deliverable expands the project's portfolio of practical knowledge resources by introducing an additional set of ten Practice Abstracts. Together, the two deliverables fulfil the project objective of producing twenty Practice Abstracts that capture innovative practices, lessons learned, and transferable solutions emerging from the RURALITIES activities and the wider rural innovation ecosystem.

To facilitate broad dissemination and long-term accessibility, the Practice Abstracts will be integrated into the RURALITIES knowledge-sharing ecosystem and made available through the project communication and dissemination channels.

To further strengthen accessibility, dissemination, and uptake, a standalone visual has been created for each Practice Abstract, summarising its key messages and practical relevance in an easily accessible format. These visuals provide concise representations of the practices and can be used independently across the project website, social media channels, newsletters, partner networks, workshops, conferences, stakeholder events, and other dissemination activities implemented throughout the remaining project duration.

The Practice Abstracts are intended to support a wide range of target groups, including rural communities, farmers, advisors, entrepreneurs, educators, researchers, innovation support organisations, local and regional authorities, and policymakers. By presenting practical and replicable solutions, the abstracts contribute to the uptake of project results and support the wider objectives of strengthening rural innovation ecosystems, fostering peer learning, and accelerating the adoption of sustainable and climate-smart practices.

The early completion of D4.15, ahead of its contractual deadline in December 2026, reflects the consortium's proactive response to the recommendations of the second project review. By advancing the preparation of the final set of Practice Abstracts, RURALITIES has been able to incorporate the reviewers' recommendations at an earlier stage and make the improved materials available for assessment and further dissemination. Any additional feedback received during the subsequent review can be considered during the remaining project period, further strengthening the usability, accessibility, and uptake of the Practice Abstracts.

As part of the project's commitment to ensuring the long-term exploitation of results, the Practice Abstracts will also serve as knowledge resources for the future RURALITIES Expertise Centres, Training Centres, Living Labs, and associated innovation support activities. Their integration into the project's digital knowledge infrastructure will further enhance their visibility and facilitate continued access beyond the project lifetime.

Through this dissemination and exploitation strategy, D4.15 contributes directly to the transfer of knowledge from research and innovation activities to practical application, reinforcing the overall impact and legacy of the RURALITIES project.

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