



NOSTRADAMUS

D1.1 MAA STRATEGIC PLAN

31/08/2025



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D1.1 MAA STRATEGIC PLAN

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Abstract	Deliverable D1.1 presents the initial Multi-Actor Approach (MAA) Strategic Plan for the NOSTRADAMUS project. The plan outlines the conceptual foundations, principles, and operational framework of the MAA, ensuring that research and innovation processes are inclusive, participatory, and aligned with real-world needs. Central to this strategy is the establishment of five regional Multi-Actor Platforms (MAPs) in Germany, Cyprus, Slovenia, Serbia, and Switzerland, serving as localized innovation ecosystems for co-creation, testing, and knowledge exchange. The deliverable defines key project target groups, provides a stakeholder analysis, and introduces targeted measures to include marginalized actors such as smallholder farmers, rural women, youth, and low-connectivity communities. It also sets forth a KPI-based monitoring framework to track engagement quality and impact throughout the project lifecycle. This strategic plan serves as the foundation for two subsequent updates (D1.2 at M24 and D1.3 at M48), ensuring that



	stakeholder engagement remains adaptive and responsive to evolving project needs.
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EXECUTIVE SUMMARY

Deliverable D1.1 outlines the initial Strategic Plan for implementing the Multi-Actor Approach (MAA) within the NOSTRADAMUS project, which aims to co-develop and scale open-source, interoperable digital solutions for sustainable, data-driven agriculture. Rooted in the Horizon Europe principles for co-creation and knowledge integration, the MAA strategy ensures that a wide range of stakeholders are meaningfully involved across all work packages and project phases, from design and development to testing and adoption. Special emphasis is placed on engaging marginalized or underrepresented groups such as smallholder farmers, youth, and rural women.

The MAA builds on the principles of Responsible R&I, Human-Centered Design (HCD), Design Thinking, and Systems Thinking, creating an inclusive, responsive, and interdisciplinary framework for stakeholder engagement. Five regional Multi-Actor Platforms (MAPs) act as localised innovation ecosystems for co-creating and testing digital tools. To monitor and evaluate stakeholder engagement, a structured KPI framework has been developed. This framework enables systematic tracking of awareness-building, participation, feedback, training, and cross-regional collaboration. These KPIs will be refined and expanded in future MAA deliverables—D1.2 (M24) and D1.3 (M48)—based on real-world feedback and evolving project needs and experiences.

This strategic plan lays the groundwork for inclusive innovation and the sustainable adoption of solutions aligned with the needs and expectations of European agricultural communities.



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ABBREVIATIONS

AKIS	Agricultural Knowledge and Innovation System
CAP	Common Agricultural Policy
EO	Earth Observation
GUI	Graphical User Interface
HCD	Human-Centred Design
KPIs	Key Performance Indicators
MAA	Multi-Actor Approach
MAP	Multi-Actor Platform
TG	Target Group
R&I	Research and Innovation
WP	Work Package



1 INTRODUCTION

NOSTRADAMUS aims to develop an open-source, modular Data Cube platform, decision-support tools, and a federated graphical user interface (GUI) that integrates Earth Observation (EO), IoT, and socio-economic data to support evidence-based decisions in farming, policy, and investment. Achieving these outcomes requires not only technical excellence but also deep and sustained engagement with end users and other stakeholders—starting from the earliest design phases and continuing throughout the project lifecycle.

Deliverable D1.1 presents the initial (out of 3) Multi-Actor Approach (MAA) Strategic Plan for the NOSTRADAMUS project—a cornerstone strategy to ensure that the project’s digital innovations for agriculture are co-created, inclusive, and grounded in real-world needs. The MAA supports the principles of Responsible Research and Innovation (R&I) by ensuring that research and innovation processes are ethically aligned, socially relevant, and open to all actors in the innovation ecosystem. In line with responsible R&I, our MAA strategy actively seeks to involve marginalized or underrepresented groups, such as smallholder farmers, rural women, and youth, ensuring their voices shape the design and adoption of digital solutions. The MAA is strongly rooted in Human-Centered Design (HCD) principles, ensuring that project solutions are user-friendly, practical, and accessible. HCD is a creative problem-solving approach that places end-user needs at the center of design through iterative processes such as interviews, co-design workshops, prototyping, and user feedback loops. This improves both the functionality of digital tools and the satisfaction of end-users. NOSTRADAMUS also applies *Design Thinking* to understand user needs, for co-created, innovative, context-specific solutions. This approach enables effective collaboration between stakeholders with diverse expertise and backgrounds, for instance, in the co-creation of digital applications tailored to the realities of agricultural practice and policymaking. Complementing this, *Systems Thinking* provides a holistic lens to understand the interconnections between the agricultural, environmental, and socio-economic components of complex food systems. It supports stakeholder mapping, evaluation of interdependencies, and the broader assessment of how digital tools influence decision-making processes across scales and sectors.

This strategic plan defines the conceptual foundations - providing clear guidelines on the application of the MAA for all project partners, stakeholder landscape, and operational framework for implementing the MAA. It includes a structured mapping of Target Groups (TGs), their interests, expected contributions, and engagement levels—anchored in the Quadruple Helix model and the principles of Responsible R&I. A special focus is placed on the creation of five regional Multi-Actor Platforms (MAPs) in Germany, Cyprus, Slovenia, Serbia, and Switzerland. These MAPs act as localized innovation ecosystems, supporting the collaborative development and contextual adaptation of project outputs—particularly predictive modelling tools, digital twin applications, and EO- and IoT-integrated services.

To ensure that the MAA is systematically implemented and effectively evaluated, a dedicated set of Key Performance Indicators (KPIs) has been established. These KPIs provide a structured framework to monitor the inclusiveness and real-world impact of stakeholder engagement and co-creation activities throughout the project.

Deliverable D1.1 also sets the foundation for two future updates—D1.2 (M24) and D1.3 (M48)—which will expand and refine the strategic plan based on lived project experience, stakeholder insights, and updated engagement metrics. Together, these deliverables ensure that the MAA remains dynamic,



responsive, and impactful, enabling NOSTRADAMUS to deliver transformative digital solutions for a resilient, data-driven European agricultural sector.

2 MULTI-ACTOR APPROACH (MAA)

The Multi-Actor Approach (MAA) is a strategic framework that ensures R&I processes are inclusive, practice-oriented, and impact-driven. It promotes responsible R&I by integrating scientific excellence with real-world relevance, fostering solutions that are not only robust but also co-created, widely applicable, and societally meaningful. It encourages the active and meaningful involvement of all relevant actors—such as researchers, farmers, advisors, businesses, civil society, and policymakers—throughout the entire lifecycle of an R&I project.

In Horizon Europe, the Multi-Actor Approach is defined as:

“a form of responsible R&I [that] aims to make the R&I process and its outcomes more reliable, demand-driven, shared and relevant to society. It also aims to have these outcomes shared more extensively. This entails more than just widely disseminating a project’s results or listening to the views of a board of stakeholders. A multi-actor project ensures the genuine and sufficient involvement of a targeted array of actors, which serves the objectives of the topic.”

— Horizon Europe - Work Programme 2023-2025: Food, Bioeconomy, Natural Resources, Agriculture and Environment, p. 21 [\[1\]](#).

At its core, the MAA fosters co-creation, knowledge sharing, collaborative decision-making, and shared ownership of results. It enhances the relevance and uptake of innovations by ensuring they are rooted in real-world needs, shaped by the people who will ultimately apply them.

2.1 RELEVANCE OF THE MAA

The MAA is a core methodological pillar of the NOSTRADAMUS project. It guides how R&I are conceived, developed, and implemented, ensuring that solutions are not only scientifically robust but also aligned with the actual needs and capacities of the actors involved in the European agri-food system.

In NOSTRADAMUS, the MAA ensures the co-creation and co-validation of demand-driven solutions by actively involving a diverse range of stakeholders — farmers and farmer organisations/associations, agricultural advisors, business actors, industry, SMEs and startups, technology providers, consumers/consumer organisations, local communities and citizens, research organizations and academia, and policymakers — throughout the entire project lifecycle. This approach fosters interdisciplinary collaboration and inclusivity, integrates diverse perspectives to bridge knowledge gaps, and aligns solutions with users’ practical needs to maximize their adoption and impact. By combining practical knowledge with scientific expertise, MAA facilitates the development of tools and practices tailored to real-world agricultural challenges. The MAA



applied in this project will ensure that all relevant perspectives are considered and that the benefits of adopting the validated open-source digital solutions are shared among all stakeholders, leading to more efficient, sustainable, and equitable EU agri-food systems.

2.2 MAA PRINCIPLES AND GUIDANCE

Implementing the MAA in NOSTRADAMUS is grounded in a set of core principles that guide how all actors collaborate, contribute, and co-own the R&I process. These principles ensure that the project delivers practical, inclusive, and scalable outcomes that respond to real needs and foster sustainable adoption.

CORE MAA PRINCIPLES

- **Co-Creation**

Stakeholders are actively involved in the co-development of solutions, ensuring innovations are designed not just for but with the end-users. This includes shared involvement in planning, implementation, and evaluation [\[2\]](#).

- **Knowledge Sharing**

Each actor brings complementary knowledge and experience, supporting mutual learning and the integration of context-specific insights that reflect real-world complexity [\[2\]](#).

- **Collaborative Decision-Making**

All relevant actors contribute to shaping the project's goals, priorities, and outputs, ensuring that decision-making reflects a balanced integration of scientific, practical, and policy perspectives [\[3\]](#).

- **Co-Ownership**

A key goal is to establish shared ownership of results, fostering long-term commitment, trust, and sustainability. When stakeholders co-own the process, they are more likely to adopt and promote its outcomes [\[3\]](#).

OPERATIONAL GUIDANCE FOR MAA IMPLEMENTATION

To ensure a consistent and high-quality application of the MAA across all project activities, the following guidelines should be actively considered and applied when planning, implementing, and reviewing all project activities and outputs. These principles are designed to support meaningful engagement, foster innovation, and ensure outputs are relevant, usable, and impactful:

- **Engage End-Users Throughout the Project Lifecycle**

From data pipeline design and tool development to pilot testing, training, and dissemination, engage stakeholders—including farmers, advisors, IT experts, and policy actors—early and



continuously. Their input is critical to ensure tools are not only innovative but also relevant, usable, and adopted in practice. In the design phase, stakeholders such as farmers, advisors, IT experts, and policy actors should participate in requirements workshops and surveys to identify functional needs and priorities for digital tools. During the development phase, iterative prototyping sessions can validate functionality and user interface design, incorporating feedback directly from farmers and advisors. In the pilot testing phase, end-users must be actively engaged in field demonstrations and feedback sessions to assess usability and performance under real-world conditions.

- **Ensure Inclusive Participation, Including Marginalized Groups**

Ensure inclusive participation, particularly focusing on marginalized or underrepresented groups such as smallholder farmers, rural women, youth, and minority communities, and address digital inclusion as a core component of equity. This includes considering connectivity limitations in rural areas when designing solutions. Digital literacy and learning capacity should be actively supported through tailored training formats, ensuring that all stakeholders, regardless of their starting point, can effectively engage with and benefit from advanced digital tools and AI-driven technologies developed in the project. In line with the principles of Responsible R&I, outreach activities, co-creation sessions, and capacity-building programs should be adapted to reduce technological barriers and empower these groups to adopt and use the developed solutions confidently.

- **Facilitate Iterative, Demand-Driven Co-Creation**

Ensure continuous refinement of tools and services through real-time, stakeholder-driven feedback loops embedded in project activities such as demonstration sites, field visits, hands-on workshops, and training sessions. These participatory processes enable farmers, advisors, and other MAP actors to co-develop solutions that are responsive to actual needs and conditions. Feedback gathered through these channels should directly inform improvements in platform functionality, usability, and contextual relevance—ensuring that digital applications are adapted to diverse agricultural systems, regional priorities, and user capabilities across Europe.

- **Leverage Interdisciplinary and Cross-Sectoral Expertise**

Foster interdisciplinary collaboration by leveraging the diverse expertise within the consortium, and actively promote cooperation among agricultural researchers, Earth Observation specialists, digital developers, policymakers, and farming communities. This cross-sectoral exchange of knowledge and perspectives is essential to the co-creation of robust, open-source tools and Copernicus-based applications that are scientifically sound, practically relevant, and aligned with the objectives of the Common Agricultural Policy (CAP) and the European Green Deal.

- **Produce Accessible, User-Centric Digital Tools and Knowledge Products**

Ensure that applications and data-driven tools are designed with and for the target users—particularly smallholder and mid-sized farmers. Prioritize intuitive interfaces, multilingual support, and practical guidance in both edge and cloud environments.



- **Ensure Broad Reach and Uptake of Outputs**

Amplify impact by aligning dissemination activities with user interests, capacities, and regional specificities. Leverage MAPs, national networks, and demonstration events to promote adoption and replication of digital solutions. The project's open calls will extend reach by enabling third-party actors to test and validate applications across diverse bio-geographical pilot sites, supporting functional, user, and field testing aligned with the MAP framework. This ensures greater relevance, usability, and scaling potential of outputs throughout the EU.

To ensure that these principles and guidelines are effectively implemented, their application will be monitored throughout the project. While KPIs on stakeholder engagement provide a quantitative measure of participation, additional qualitative evidence will be gathered to capture how MAA principles—such as co-creation, knowledge sharing, and co-ownership—are operationalized in practice. This includes documenting co-creation sessions, decision-making processes, and stakeholder feedback gathering during design, development, and pilot phases. These insights will feed into the updated MAA Strategic Plan to report progress and identify areas for improvement.

2.3 MAA STRATEGIC PLAN

NOSTRADAMUS' MAA Strategic Plan draws on a rich foundation of EU frameworks and best practices, including EIP-AGRI Operational Groups, the SCAR-AKIS Strategic Working Group, and Horizon 2020/Europe projects (e.g., LIAISON [4], SHERPA [5]). These efforts demonstrate that sustained, structured stakeholder engagement enhances the relevance, usability, and uptake of innovations—especially digital solutions—within the agricultural sector.

To translate this strategic intent into action, NOSTRADAMUS has developed this dedicated MAA Strategic Plan (D1.1), which serves as a guiding framework for all actors included in the project. This plan provides:

- A clear rationale and objectives for adopting the MAA,
- Core principles for inclusive and responsible research,
- Guidelines for embedding multi-actor engagement across all work packages and activities,
- Setting measurable goals to evaluate the MAA.

It ensures that all partners approach R&I in a co-creative, transparent, and impact-oriented manner, contributing to the project's goal of building resilient, data-driven, and equitable agri-food systems across the EU.

This strategic vision is visualized through the Figure 1 "Envisioned Engagement of Stakeholders Across Nostradamus' Lifespan", which maps the full journey of stakeholder involvement—from project initiation to post-project sustainability—and shows how MAA activities are embedded horizontally across all WPs. The figure visualizes a living ecosystem of collaboration and illustrates how stakeholder engagement is built progressively:



1. Establishing a robust foundation through the composition of the consortium and definition of precise roles (Steps 1-2),
2. Identifying and involving target groups (TGs) and operationalizing five Multi-Actor Platforms (MAPs) (Steps 3-4), providing the mechanism for structured collaboration through which all actors can contribute to outputs.
3. Ensuring continuous stakeholder engagement to surface needs, opportunities, and capacities (Steps 5-6), supporting co-creation as a central principle, while stakeholders are involved early in identifying priorities and gaps, ensuring that the digital solutions are grounded in real, localised needs.
4. Facilitating knowledge exchange activities and cross-exchange of experiences (Step 7-8), such as participatory workshops, peer-to-peer learning, and thematic dialogue sessions involving all actor types, demonstrating how stakeholders are not passive recipients but contributors of context-specific knowledge and practical experience.
5. Enabling co-creation with all actors and providing continuous feedback loops (Steps 9-10), marking the point where solution design and development are carried out collaboratively and providing a mechanism for iterative improvement based on stakeholder input, further reinforcing co-creative loops throughout the project.
6. Supporting demonstration activities and skills fertilization (Steps 11-12), allowing stakeholders to engage in pilot site visits, technology demonstrations, and peer-to-peer learning events, supporting knowledge circulation, and ensuring stakeholders are equipped not only to understand but also shape and apply solutions.
7. Developing user-friendly digital knowledge platforms and investing in capacity building (Steps 13-14), ensuring accessibility and autonomy in using project tools and platforms.
8. Culminating in the broad implementation and exploitation of project results (Step 15), reflecting the goal of shared ownership, where stakeholders are empowered to sustain and scale outcomes independently after the project ends.

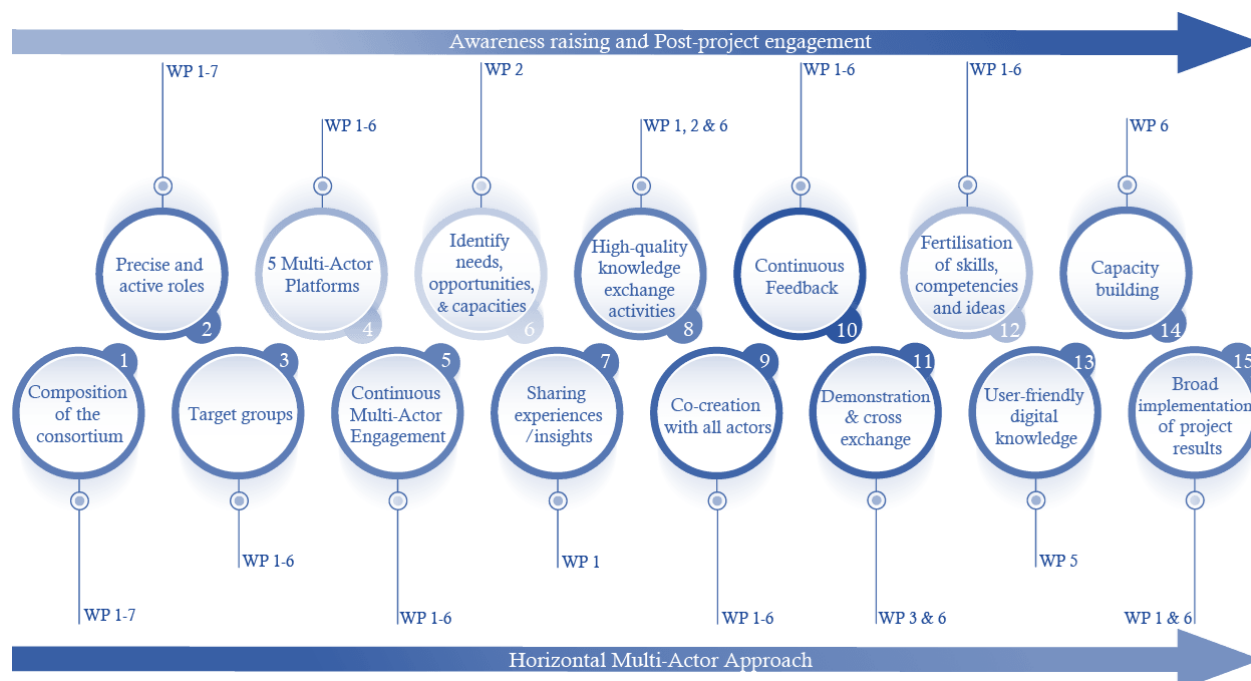


FIGURE 1: ENVISIONED ENGAGEMENT OF STAKEHOLDERS ACROSS NOSTRADAMUS' LIFESPAN [6]

2.4 MAA OBJECTIVES

The MAA in NOSTRADAMUS is structured around clear objectives [6] that align with both the project's ambitions and Horizon Europe's expectations. These objectives ensure that stakeholder collaboration is meaningful and strategic in driving innovation and practical outcomes.

- **Stakeholder Engagement and Interdisciplinary Collaboration**

Foster active and sustained involvement of a diverse range of stakeholders—such as farmers, advisors, researchers, policymakers, industry actors, civil society, and marginalized communities—through the development and operationalization of Multi-Actor Platforms (MAPs). These MAPs will serve as structured environments for cross-sectoral and interdisciplinary collaboration, facilitating inclusive dialogue, co-creation of knowledge, and mutual learning. This enhances the integration of agricultural, technical, and social sciences in addressing complex agri-food challenges. The MAPs will also enable the identification of context-specific needs, requirements, and capacities of stakeholders, ensuring that digital solutions are relevant, acceptable, and scalable. Furthermore, MAPs will support participatory processes in the design, development, validation, and exploitation of project outcomes.

- **Co-creation, Co-Validation and Knowledge Exchange**

Ensure that innovation is co-created with end users and validated in real-world settings through a robust, participatory process embedded across all phases of the project. Leveraging the established MAPs, the project engages various stakeholders in structured co-design, testing, and refinement of



digital solutions. Stakeholder activities will include for example participatory workshops to gather needs, priorities, and feedback, cross-visits to pilot sites to demonstrate and evaluate digital technologies in context, training sessions and online learning modules tailored to different stakeholder, focus groups, surveys and exploitation and dissemination events, including community outreach, and scientific conferences to ensure knowledge flows across disciplines and regions. These engagements will ensure continuous knowledge sharing and feedback loops that embed stakeholder insights into digital tools' design, deployment, and improvement.

- **Inclusivity of Marginalized Groups**

Guarantee the active inclusion of marginalized groups—particularly socio-economically disadvantaged communities and stakeholders in regions with limited connectivity or restricted access to digital technologies—through targeted, context-sensitive strategies. Recognizing that such areas and groups are often overlooked in digital transformation initiatives, the project will prioritize their voices and needs within the MAPs and other engagement activities.

Special attention will be given to:

- Ensuring inclusivity of a wide range of stakeholders by adapting communication and participation methods to overcome barriers such as low digital literacy or limited infrastructure;
- Tailoring engagement formats (e.g., local-language workshops, offline training materials, and hybrid outreach methods) to reach those with weak or no connectivity;
- Integrating their perspectives into co-creation and validation processes, ensuring solutions are designed to be accessible, affordable, and relevant for these communities.

- **Delivery of Practical and Scalable Solutions**

Develop and deploy ready-to-use, open-source digital applications that are tailored to user requirements and aligned with the EU's CAP and Green Deal goals. Solutions are designed for scalability and adaptability, ensuring long-term relevance beyond the project's lifetime.

- **Sustainability and Long-Term Knowledge Transfer**

Transform co-created knowledge into accessible, practice-oriented outputs, such as EIP-AGRI practice abstracts, data cubes, and training resources. The project will implement robust sustainability and dissemination strategies to ensure continuity, replication, and adoption across EU agri-food systems.

3 MAA IMPLEMENTATION

This chapter outlines the systematic implementation of the MAA within the NOSTRADAMUS project, highlighting how stakeholder engagement will be strategically embedded into the initiative. The MAA ensures that research and innovation processes are co-created with those who are most affected by or influential in agricultural digitalization—farmers, researchers, policymakers, advisors, and other key actors across Europe.

The chapter begins with the definition and categorization of Project Target Groups (Section 3.1), providing clarity on the diverse communities involved in and benefiting from the project. This is followed by a detailed stakeholder analysis (Section 3.2), which lays the groundwork for inclusive engagement by identifying relevant stakeholders and mapping their roles, influence, and interests. Finally, Section 3.3 introduces the five regional Multi-Actor Platforms (MAPs), which serve as place-based innovation ecosystems for co-creation and testing of digital solutions.

3.1 PROJECT TARGET GROUPS

At the project level, a diverse set of Target Groups (TGs) has been identified as key actors in the successful implementation and impact of the NOSTRADAMUS project. Initially, TGs 1 through 8 were defined during the proposal phase (GA, Page number 24), reflecting core stakeholders such as IT providers, researchers, policymakers, and land managers. During the first year of implementation, this list was strategically expanded to include additional groups (TGs 9–12) to better capture the evolving landscape of agricultural digitalization, enhance inclusivity, and strengthen the project's MAA. These groups represent a wide range of sectors—public, private, academic, and civil society, and represent all Quadruple helix Models, which play distinct but complementary roles in both benefiting from and contributing to the project's outcomes.

The following table outlines each TG along with their Quadruple Helix Model affiliation, the expected benefits they receive from the project, and the value they contribute back to NOSTRADAMUS.

TABLE 1: PROJECT TARGET GROUPS

	Target Group	Quadruple Helix Groups	Benefits received from NOSTRADAMUS	Contributions provided to NOSTRADAMUS
TG1	IT solution providers	Industry/Private Sector	Access to open-source digital tools for app development and service provision	Technical development, scalability expertise, and co-creation of digital tools
TG2	Research Institutions and Universities	Academia/Research	Participation in interdisciplinary research, training, and capacity building	Scientific validation, training delivery, knowledge transfer
TG3	Policy Makers	Government/Public Sector	Better decision-making through data-driven	Policy feedback, regulatory alignment,



			policies and monitoring tools	adoption of digital solutions
TG4	Investment advisors in agriculture	Academia/Research	Data-driven insights for strategic investment and risk analysis	Economic validation, investment trends, financial feasibility checks
TG5	Land Managers (Farmers and Producer Organizations)	Civil Society	Digital tools for improved productivity, profitability, and decision-making. *Special attention will be given to ensuring the participation of marginalized land managers, such as small-scale farmers, women-led farms, and those in remote regions, who may otherwise lack access to digital innovation processes.	Real-world feedback, pilot site testing, use-case scenarios
TG6	Agricultural advisory services	Academia/Research	Tools to enhance advisory service efficiency and impact	Link to farming communities, dissemination and advisory model innovation
TG7	Ag-tech industry	Industry/Private Sector	Access to co-developed technologies, market-ready innovations	Technology transfer, commercialization potential, R&D validation
TG8	Society (Local Communities and Citizens)	Civil Society	Greater awareness of digital agriculture and food system transformation	Social legitimacy, inclusivity feedback, societal acceptance
TG9	SMEs and Startups	Industry/Private Sector	New digital market opportunities and access to open-source platforms	Agility in innovation, testing of business models
TG10	Civil Society Organizations and NGOs	Civil Society	Inclusion in digital transformation debates, advocacy potential	Advocacy for inclusiveness, policy feedback, grassroots mobilization
TG11	Development and Innovation Hubs (facilitate innovation in/digital transformation of agriculture)	Industry/Private Sector	Tools and collaboration for scaling agri-digital transformation	Facilitation of regional uptake, ecosystem building
TG12	Data Governance & Ethics Experts	Government/Public Sector	Opportunities to influence ethical, fair data usage in agriculture	Frameworks for data governance, compliance, and trust-building



3.2 STAKEHOLDER ANALYSIS

A two-step stakeholder analysis was conducted in NOSTRADAMUS to ensure that the project's MAA is grounded in a clear understanding of the roles, interests, and contributions of all relevant actors. This analysis spans the five regional MAPs, reflecting the project's commitment to both local relevance and EU-wide impact.

The primary objective of this exercise was to identify who needs to be engaged, to what extent, and what types of knowledge or input are necessary from each stakeholder to effectively and inclusively achieve the project's goals. The analysis served as the foundation for a systematic and adaptive stakeholder engagement strategy.

Specifically, the process involved the development of a structured engagement plan that clarified:

1. Which actors need to be involved (e.g., farmers, advisors, researchers, policymakers, SMEs),
2. The level and nature of their involvement required at different project stages,
3. The specific contributions or expertise expected from each stakeholder group to support the co-creation of outcomes.

METHODOLOGICAL APPROACH

In the first step of the Stakeholder Analysis, all relevant stakeholders were identified, and a comprehensive list of all relevant stakeholders and stakeholder organizations was generated.

For identifying stakeholders, we followed the following guiding questions:

- Who are the end-users? Which stakeholders will use the end product in the future?
- Who are the direct beneficiaries? In addition to end-users, other individuals or groups may benefit directly from the product or innovation.
- Who are the decision-makers? Individuals or groups with the authority to make decisions regarding the implementation or adoption of the innovation.
- Who are the technical providers? Individuals or companies that supply the technical components, infrastructure, or services required for the product's development, implementation, or maintenance.

In the second step of the Stakeholder Analysis, stakeholders were evaluated to determine their relative importance by mapping stakeholders in this *Influence-Interest Matrix* (Figure 1). In the Influence-Interest Matrix the stakeholders are categorized based on their level of interest in and influence on the project, which can be either high or low. This matrix plots stakeholder influence, which refers to their ability to offer valuable contributions and have positive impacts on the research or hinder its progress, and the stakeholder's interest in the project. It helped identify the priority level and engagement strategy for each stakeholder, providing practical insights into how stakeholders should be involved, consulted, informed, or closely collaborated with.



The four boxes reflect distinct levels of participation, ranging from the lowest level of "inform" to the intermediate levels of "consult" and "involve," and finally to the highest level of "collaborate". Using this approach, it is then possible to better tailor levels of stakeholder engagement to different groups. This approach reveals information on how particular stakeholders are best managed and gives indications on which stakeholders should be managed more closely compared to others. Not every stakeholder needs to be involved to the same degree, or at the same time and the same stakeholder may be of differing relevance at different stages of the research. This determines the identified stakeholders' overall level of engagement. Depending on which quadrant a stakeholder was designated, their level of engagement will correspond accordingly.

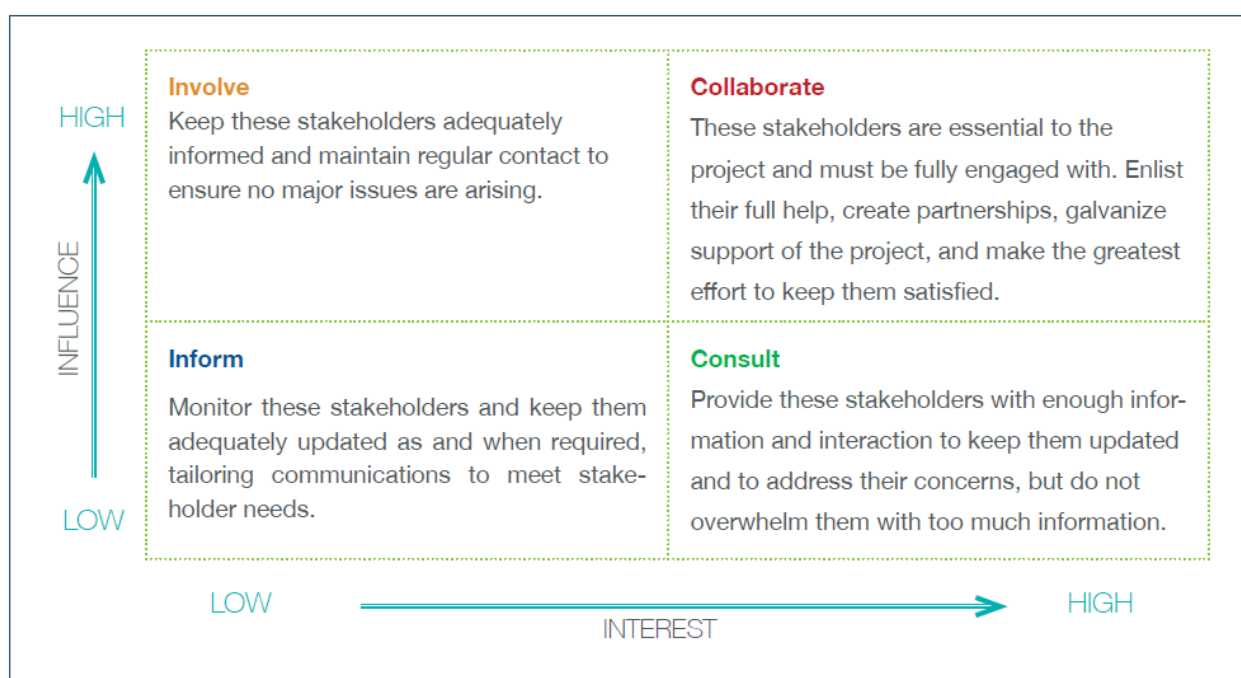


FIGURE 2: INFLUENCE/INTEREST-MATRIX.

(TAKEN FROM: [\[7\]](#) DURHAM E., BAKER H., SMITH M., MOORE E. & MORGAN V. (2014). THE BIODIVERSA STAKEHOLDER ENGAGEMENT HANDBOOK. BIODIVERSA, PARIS (108 PP).)

The exercise was conducted in a workshop format, engaging all consortium partners in the reflection process. This not only revealed critical information for stakeholder management but also helped raise awareness within the consortium of the importance of stakeholder engagement throughout the project lifecycle.

OUTCOMES AND STRUCTURE

The stakeholder analysis defined:

- Their level of influence and interest
- Their expected contributions to co-creation and validation activities,

The outcomes of this analysis are presented in detail in Chapters 3.3.1. to 3.3.5., structured by each of the five MAP regions (Germany, Slovenia, Serbia, Cyprus, and Switzerland), providing a localized and actionable overview of stakeholder dynamics.

3.3 INCLUSION OF MARGINALIZED GROUPS

In the NOSTRADAMUS project, the MAA is central to building a resilient, sustainable, and digitally enabled agricultural sector. As highlighted in the project's proposal, the success of this approach depends not only on broad stakeholder participation but also on the **intentional inclusion of marginalized groups**, those who are often excluded due to geography, gender, age, socio-economic status, or limited access to digital tools.

Marginalized actors, such as small-scale and elderly farmers, youth, women, ethnic minorities, and communities in low-connectivity regions, frequently face barriers to participating in digital transformation processes. These barriers include high costs, limited awareness of innovations, a lack of representation in governance, infrastructural challenges, and cultural or language-based exclusion. If left unaddressed, these structural inequalities can lead to widening gaps in digital adoption, innovation capacity, and policy influence.

Table 2 below provides a general overview of the key marginalized groups identified through stakeholder mapping, the risks they face in the digitalization of agriculture, and the targeted mitigation strategies formulated to support their active and sustained involvement throughout the project lifecycle.

TABLE 2: MITIGATION STRATEGIES FOR ENSURING INCLUSIVE PARTICIPATION

Marginalized Group	Risk	Mitigation Strategy
Farmers in low-connectivity areas	Poor infrastructure	Developing offline-compatible tools
	Isolation from innovation due to geographic location	Implementing targeted outreach strategies, through our locally based MAPs, with on-site training and demonstration events, to ensure inclusion in co-creation and adoption.
Small-scale farmers	High cost of precision agriculture and AI tools	Promoting open-source solutions, ensure free access to project tools, and connect farmers to funding via future R&I projects.
	Lack of funds for investments in sustainable practices or modern technologies	Project outputs will help banks in production monitoring and informed decision-making with loan approval



	Lack of access to knowledge and training	Offering free training, knowledge dissemination, and free use of digital tools.
Elderly farmers	Low digital awareness	Providing simplified, age-appropriate in-person training; encourage peer learning and face-to-face workshops.
	Resistance to new technologies	Showcasing peer farmer success stories and involving elderly farmers in demonstrations.
Youth farmers	Low adoption of precision agriculture	Developing youth-oriented outreach strategies; promote digital entrepreneurship and skill-building; ensure visibility of career opportunities in Agri-Tech.
	Lack of tailored innovation opportunities	
Female farmers / Women in agriculture	Underrepresentation in decision-making	Ensuring gender-balanced representation in MAPs, training and demonstration events; involving them in co-creation
	Limited access to tools, training, and funding due to gender roles	
Socio-economically disadvantaged citizens	Financial constraints	Ensuring free access to tools; providing free training; and leveraging MAP-based community support networks.
	Low digital literacy	Developing intuitive, user-friendly tools with simplified interfaces, multilingual support, and clear visual guidance
Migrant workers	Language barriers	Offering multilingual support and outreach programs
	Limited access to support services and tools	

3.4 MULTI-ACTOR PLATFORMS (MAPS)

To ensure regional relevance, inclusiveness, and effective co-creation, the NOSTRADAMUS project has established **five regional MAPs, place-based innovation ecosystems of key stakeholders** from the agricultural sector and cereal production domain, as the **foundation for five demonstration sites**. These demonstration sites will serve as pilot locations for refining and testing the core modules and applications, as well as environments for stakeholder engagement activities (e.g., demonstrations, training activities, visits with young scientists, visits with IT experts and farmers' associations to identify the challenges and limitations of current technologies, etc.).

These MAPs represent geographically and contextually diverse environments across Europe, encompassing a broad spectrum of agricultural practices, stakeholder needs, digital readiness levels, and policy landscapes. Each MAP serves as a place-based innovation ecosystem that brings



together key regional actors—from farmers and researchers to technology providers, advisors, and public authorities—into a collaborative structure that facilitates the project's interdisciplinary and multi-actor approach. Their role goes beyond piloting activities—they also provide direct advice to Work Packages (WPs) 2 to 6 on stakeholder engagement and knowledge transfer necessary to meet the objectives of these WPs.

To facilitate continuous interaction and communication, each MAP has a dedicated communication contact point, ensuring the flow of information between the regional MAPs and the NOSTRADAMUS consortium. This mechanism supports not only localized co-creation but also cross-regional learning and alignment.

The chapters 3.3.1. – 3.3.5. provide detailed information about each MAP:

- Key stakeholders,
- Key contributions of each stakeholder,
- Current engagement status as of Month 12 (M12) of the project.

The regional MAPs are dynamic structures that will continue to evolve throughout the project. In subsequent updates of the MAA Strategic Plan (D1.2 at M24 and D1.3 at M48), each MAP will be revised to include new stakeholders, updated roles and contributions, and engagement status. These updates will reflect ongoing stakeholder outreach efforts and the growing network of actors involved in the co-creation, testing, and validating NOSTRADAMUS output.

3.4.1 MAP DE

Region / Pilot Site	Germany
Lead Coordinating Organisation	DLG EV (DLG e.V.)
Contributing Organisations	/
MAP Communication contact point	Nils Borchard
Local Challenges of Demonstration site	The German demonstration site faces challenges related to low average internet speeds in rural areas, which hinder the deployment of digital farming solutions. Despite high agricultural training levels, practical experience with advanced management practices (AMP) remains limited. Additionally, balancing high cereal yields with low fertilizer use, as shaped by national policies, presents a key sustainability and data management challenge.

TABLE 3: MAP DE

Organization, Institution	Assigned TG	Role & Potential Contribution	Engagement Level	Engagement Status at M12
		(indicate their area of expertise, role of their works and their potential contributions to the project)	(Classify the stakeholder's influence and interest based on the matrix.)	(Indicate whether the stakeholder has been contacted, is actively engaged already, or needs further outreach)
University of Applied	TG1 – IT solution	Applied research institution with expertise in digital twins and system	Involve	needs further outreach



Sciences Anhalt	providers	modelling. Potential contributor to the implementation of Nostradamus outcomes in their digital twin applications, enabling real-world testing and scaling.		
Federal Research Centre for Cultivated Plants	TG1 – IT solution providers	Expert in crop science and drought resilience. Interested in accessing and analysing Nostradamus data outputs related to drought resistance and water-use efficiency.	Inform	needs further outreach
State Institute for Agriculture and Horticulture Saxony Anhalt	TG3 – Policy Makers	Regional public body with links to agricultural stakeholders. Regional public body with links to agricultural stakeholders. Acts as a communication bridge to disseminate project outcomes and policy implications to regional farming actors.	Inform	needs further outreach
Lower Saxony Chamber of Agriculture	TG3 – Policy Makers	Key regional institution with extensive farmer networks. Potentially valuable in facilitating adoption and feedback loops from practitioners.	Inform	needs further outreach
KWS	TG7 – Ag-tech industry	International seed breeding company. Can test and integrate Nostradamus outputs into seed selection tools and assess commercial scalability of predictive outputs in breeding programs.	Involve	is actively engaged



SKW Piesteritz	TG7 – Ag-tech industry	Major fertilizer producer with agronomic R&D expertise. Could evaluate Nostradamus-based recommendations for nutrient management under changing climate conditions.	Involve	needs further outreach
Claas	TG7 – Ag-tech industry	Farm machinery manufacturer focused on digital services. May be interested in potential alignment of Nostradamus predictive tools with their ICT solutions, such as precision farming platforms.	Consult	needs further outreach
Rabobank	TG4 – Investment advisors in agriculture	Agricultural finance actor. Can provide insights on how NOSTRADAMUS risk indicators can be embedded in agricultural loan models and advise on integrating climate resilience metrics into financial tools.	Inform	needs further outreach
Bitkom	TG10 – Civil Society Organizations and NGOs	Germany's digital industry association. May act as multiplier to increase awareness among tech stakeholders and promote responsible AI applications in agri-tech.	Inform	needs further outreach
IfIS Consulting and Projects	TG9 – SMEs and Startups	SME consultancy with strong regional networks. Can support dissemination to rural actors and small businesses in Hesse, enhancing project uptake at local levels.	Inform	needs further outreach



UNU Flores (Dresden)	TG2 – Research Institutions and Universities	International research hub. Potential contributor to the scientific validation of project methodologies and integration in global sustainability discourse.	Inform	needs further outreach
Fraunhofer HHI	TG2 – Research Institutions and Universities	Applied research institute in AI and ICT. Could help validate technical robustness of predictive models and support ethical AI integration in agriculture.	Involve	needs further outreach
VDMA	TG10 – Civil Society Organizations and NGOs	Industrial association for machinery and equipment. May help translate Nostradamus outcomes into actionable insights for agri-machinery developers and suppliers.	Inform	needs further outreach
Ag Gateway	TG10 – Civil Society Organizations and NGOs	Global NGO focused on agricultural data standards. Could contribute to interoperability frameworks for data-sharing relevant to Nostradamus digital services.	Inform	needs further outreach
Xarvio	TG1 – IT solution providers	Developer of commercial digital farming solutions. Potential end-user of Nostradamus outcomes. Can directly test and integrate Nostradamus outputs into commercial decision-support platforms for farmers.	Inform	is actively engaged
Prototype Club	TG1 – IT solution	Innovation hub focused on ICT	Inform	needs further outreach



	providers	prototyping. Potential end-user of Nostradamus outcomes. May support early-stage design or testing of user interfaces for project tools.		
DKE Data	TG12 – Data Governance & Ethics Experts	Data infrastructure expert in agriculture. Can contribute expertise in secure, interoperable data infrastructure and help ensure that Nostradamus outcomes align with real-world data exchange standards and governance frameworks, supporting scalability and adoption.	Involve	needs further outreach

3.4.2 MAP CY

Section	Content
Region / Pilot Site	Cyprus
Lead Coordinating Organisation	ERATOSTHENES CENTRE OF EXCELLENCE (ECoE)
Contributing Organisations	MARDE
MAP Communication contact point	Ioannis Varvaris
Local Challenges of Demonstration site	Cyprus faces several interconnected challenges, including the lowest cereal yield and land use for cereals in the EU, combined with one of the highest fertilizer consumption rates. Most farmers rely solely on practical experience, lacking formal agricultural training, which hinders the adoption of modern practices. Additionally, low average internet speeds further constrain the deployment of digital farming solutions. Overcoming these barriers is essential to enhance sustainability and productivity in the region.

TABLE 4: MAP CY

Organisation, Institution	Assigned TG	Role & Potential Contribution (indicate their area of expertise, role of their works and their potential contributions to the project)	Engagement Level (Classify the stakeholder's influence and interest based on the matrix)	Engagement Status at M12 (Indicate whether the stakeholder has been contacted, is actively engaged already, or needs further outreach)
Ministry of Agriculture, Rural Development and	TG3 – Policy Makers	Key national authority on agriculture and environment. Provides high-level policy input, supports alignment of	Collaborate	is actively engaged



Environment		NOSTRADAMUS outputs with CAP goals, and facilitates institutional integration of project results.		
Ministry of Research, Innovation and Digital Policy	TG3 – Policy Makers	Central actor in national digital transformation. Offers scientific research, data analysis, and policy advisory support, and further exploitation of Nostradamus outcomes.	Inform	needs further outreach
National AKIS ecosystem	TG6 – Agricultural Advisory Services	National Contact point for Cyprus AKIS. Acts as a knowledge broker between science and practice, ensuring advisory services are integrated into co-creation and dissemination processes.	Collaborate	is actively engaged
Cyprus University of Technology	TG2 – Research Institutions and Universities	Academic institution with expertise in pest management. Potential collaboration with GOOD LLs, data requirements.	Collaborate	has been contacted
Limassol Municipality	TG8 – Society (Local Communities and Citizens)	Local authority. Supports outreach for potential exploitation of project outcomes and inviting farmers to participate in demonstrations and capacity building activities.	Inform	needs further outreach
Paralimni Municipality	TG8 – Society (Local Communities and Citizens)	Local authority. Acts as a regional facilitator for community engagement, offering access to local farmers and helping increase visibility and impact of project	Inform	needs further outreach



		demonstrations.		
Ayia Napa Municipality	TG8 – Society (Local Communities and Citizens)	Local authority. Acts as a regional facilitator for community engagement, offering access to local farmers and helping increase visibility and impact of project demonstrations.	Inform	needs further outreach
Paphos Municipality	TG8 – Society (Local Communities and Citizens)	Local authority. Acts as a regional facilitator for community engagement, offering access to local farmers and helping increase visibility and impact of project demonstrations.	Inform	needs further outreach
Cyprus Agricultural Payments Organisation	TG3 – Policy Makers	Public agency. Provides insight into data requirements and potential exploitation of project outcomes, providing insights for policy shaping and supporting CAP.	Consult	needs further outreach
Panagrotikos	TG5 – Land Managers (Farmers and Producer Organizations)	Farmer organization with national reach. Facilitates engagement with farmers for identifying needs and challenges across Cyprus and potential use the developed digital solutions.	Involve	has been contacted
PEK	TG5 – Land Managers (Farmers and Producer Organizations)	Farmers Union. Help engaging farmers for identifying needs and challenges across Cyprus and potential use the developed digital	Involve	needs further outreach



		solutions.		
Cyprus Phassouri Plantations Co Ltd	TG5 – Land Managers (Farmers and Producer Organizations)	Large-scale agricultural operation. Offers a testbed for validating NOSTRADAMUS solutions, potential exploitation of Nostradamus outcomes in land uses beyond cereals.	Inform	has been contacted
Cyprus Millers by Hadjigiorkis	TG7 – Ag-tech Industry	Agro-industry actor in cereal value chains. Provides insights into challenges and needs of cereal farmers across Cyprus, including business and socio-economic issues faced by these communities in their daily operations.	Involve	needs further outreach
DEPI Spectrum LTD	TG1 – IT Solution Providers	Technology provider with platform development expertise. Provides insights into data requirements and assessment of the user-friendliness of digital solutions and platforms.	Collaborate	has been contacted
Cyprus Environment Foundation	TG10 – Civil Society Organizations and NGOs	Environmental NGO supporting sustainability education. Supports awareness raising about EU strategies, and the potential exploitation of the Nostradamus digital platform for sustainable development.	Inform	needs further outreach
Friends of the Earth Cyprus	TG10 – Civil Society Organizations and	Advocacy organization engaged in ecological transformation. Supports awareness raising about EU	Inform	needs further outreach



	NGOs	strategies and the potential exploitation of the Nostradamus digital platform for sustainable development.		
Terra Cypria–the Cyprus Conservation Foundation	TG10 – Civil Society Organizations and NGOs	Promotes sustainable land management and biodiversity. Contributes to outreach and supports long-term sustainability narratives associated with project outputs.	Inform	needs further outreach
Magnetar Ltd	TG9 – SMEs and Startups	SME exploring commercial applications of digital agriculture. Helps validate business models and creates early-stage pathways for exploitation and scale-up of project innovations.	Inform	has been contacted
ATLANTIS	TG1 – IT Solution Providers	Environmental ICT firm. Gives insights into data requirements for environmental sustainability to support informed decision-making and policy development.	Consult	needs further outreach



3.4.3 MAP SL

Section	Content
Region / Pilot Site	Slovenia
Lead Coordinating Organisation	ITC - INOVACIJSKO TEHNOLOSKI GROZD MURSKA SOBOTA
Contributing Organisations	KMETIJSKO GOZDARSKA ZBORNICA SLOVENIJE - KMETIJSKO GOZDARSKI ZAVOD MURSKA SOBOTA
MAP Communication contact point	Tomaž Bokan
Local Challenges of Demonstration site	The Pomurje region of Slovenia faces structural challenges including small farm sizes, high land fragmentation, and weak bargaining power among farmers, leading to low agricultural incomes. Despite fertile land and good sensor infrastructure, the uptake of data-driven decision support remains limited. Enhancing digital adoption and improving farm-level competitiveness are key to addressing these barriers and boosting productivity in a traditionally underserved agricultural region.

TABLE 5: MAP SL

Organization, Institution	Assigned TG	Role & Potential Contribution (indicate their area of expertise, role of their works and their potential contributions to the project)	Engagement Level (Classify the stakeholder's influence and interest based on the matrix.)	Engagement Status at M12 (Indicate whether the stakeholder has been contacted, is actively engaged already, or needs further outreach)
Ministry of Digital	TG3 – Policy makers	National authority driving digital government and data	Consult	has been contacted



transformation		infrastructure. Support in digitalisation of institutions and access to relevant data sources.		
Municipality of Murska Sobota (MOMS)	TG8 – Society (Local Communities and Citizens)	Local authority with influence on regional development. Can offer support in case of local policy and strategies development.	Consult	has been contacted
Institute of agriculture and forestry	TG6 – Agricultural advisory services	Regional Agricultural Advisory Services. Can provide relevant datasets and expert knowledge, and further exploitation of Nostradamus outcomes.	Involve	is actively engaged
Farmers	TG5 – Land Managers (Farmers and Producer Organizations)	End-users of digital tools and primary co-creators in solution development. Engage in piloting, provide real-world feedback on tool usability, and ensure project outputs meet on-farm decision-making needs.	Collaborate	needs further outreach
TERMODRON (SME – solution providers)	TG7 – Ag-tech industry	Technology provider specializing in drone-based agricultural monitoring. Contributes to testing and integration of remote sensing capabilities within NOSTRADAMUS tools and supports scalability of field diagnostics modules.	Collaborate	needs further outreach
Green Point (Local food	TG9 – SMEs and	Short supply chain actor offering insights into local agri-food	Collaborate	needs further outreach



supplier)	Startups	systems. Helps validate use cases for small-scale producers and contributes to aligning digital tools with traceability and sustainability requirements.		
Development center Murska Sobota	TG11 – Development and Innovation Hubs	Regional innovation hub supporting digital transformation in agri-food. Promotes collaboration among SMEs, supports early adoption of project results, and acts as a catalyst for regional upscaling and ecosystem engagement.	Inform	has been contacted



3.4.4 MAP RS

Section	Content
Region / Pilot Site	Serbia
Lead Coordinating Organisation	BIOSSENSE INSTITUTE - RESEARCH AND DEVELOPMENT INSTITUTE FOR INFORMATION TECHNOLOGIES IN BIOSYSTEMS
Contributing Organisations	CROPT DOO NOVI SAD
MAP Communication contact point	Oskar Marko
Local Challenges of Demonstration site	The Serbian demonstration site faces challenges linked to highly fragmented farmland, predominantly managed by smallholder farmers, which complicates large-scale deployment of digital solutions. While digital literacy is increasing, widespread adoption remains uneven. Solutions must be tailored to small-scale operations with diverse crops and varying levels of technological readiness, despite promising uptake through existing platforms like AgroSense and strong institutional support.

TABLE 6: MAP RS

Organization, Institution	Assigned TG	Role & Potential Contribution (indicate their area of expertise, role of their works and their potential contributions to the project)	Engagement Level (Classify the stakeholder's influence and interest based on the matrix.)	Engagement Status at M12 (Indicate whether the stakeholder has been contacted, is actively engaged already, or needs further outreach)
Land governance Authority	TG3 - Policy Makers	Government agency. Ensures alignment with land use policies and regulations; Provides access to LPIS	Consult	needs further outreach



		(currently being developed) and land management registries.		
Ministry of Agriculture	TG3 - Policy Makers	National authority for agricultural policy. Offers policy guidance to align project objectives with national agricultural strategies.	Consult	needs further outreach
Agricultural Payment Agency	TG3 - Policy Makers	Administers farm subsidies and CAP-equivalent programs. Provides insights into subsidy management and payment mechanisms.	Consult	needs further outreach
Vojvodina Secretariat for Agriculture	TG3 - Policy Makers	Provincial body with jurisdiction over regional agri-policy. Provides territorial insights and promotes adoption of NOSTRADAMUS tools within regional development and extension programs.	Consult	needs further outreach
Serbia Innovates - government initiative	TG11 - Development and Innovation Hubs	National innovation platform fostering ICT and startup ecosystems. Supports innovation dissemination and promotes the project within the national IT and agri-tech ecosystem.	Consult	needs further outreach
World Bank / IFC	TG4 - Investment advisors in agriculture	International financial institution. Provides expertise in funding of sustainable agriculture and rural development.	Consult	needs further outreach
NLB Komercijalna Banka	TG4 - Investment	Regional bank offering expertise in funding of sustainable agriculture	Collaborate	needs further outreach



	advisors in agriculture	and rural development; Supports farmers with tailored financial products linked to the platform (e.g., loans for precision farming tools).		
Farmers	TG5 - Land Managers (Farmers and Producer Organizations)	Act as primary end-users, providing valuable feedback for solution development and testing; Supply data on farming practices to enhance the platform's algorithms and insights.	Collaborate	needs further outreach
Digital Serbia - government initiative, support for IT community	TG1 - IT solution providers	National initiative supporting the ICT sector. Raises awareness of NOSTRADAMUS within the developer community and connects the project with software providers and startups in digital agriculture.	Inform	needs further outreach
Trading companies	TG9 - SMEs and Startups	Can use project outputs (e.g., yield predictions, geospatial maps) for supply chain optimization, and provide market data	Inform	needs further outreach
Seed company - Corteva Serbia	TG7 - Ag-tech industry	Global seed company with local presence. Provides agronomic data and field insights.	Inform	needs further outreach
Insurance company - Generali Serbia	TG4 - Investment advisors in agriculture	Leader in agricultural insurance. Offers insights in the agricultural insurance sector, its dynamics, problems and market potential.	Involve	needs further outreach



Agricultural distributor - Agromarket Serbia	TG9 - SMEs and Startups	Major input supplier in the region. Shares agronomic data and user needs from its farmer network, helping contextualize solutions for input optimization and advisory support.	Inform	needs further outreach
S&T Parks	TG2 - Research Institutions and Universities	National S&T infrastructure linking academia and industry. Supports collaboration with research bodies and facilitates access to startups for testing and scaling of NOSTRADAMUS innovations.	Inform	needs further outreach
Business Incubators	TG11 - Development and Innovation Hubs	Provide mentoring, co-working, and innovation matchmaking services relevant to early-stage agri-tech ventures working with project outcomes.	Inform	needs further outreach
SUMP - association of youth farmers	TG10 - Civil Society Organizations and NGOs	Youth-led farming organization promoting innovation in agriculture. Can support engagement of next-generation farmers in tool testing and knowledge transfer activities.	Involve	needs further outreach
Digital Village - Mokrin House	TG8 - Society (Local Communities and Citizens)	Rural innovation hub blending agriculture and technology. Can provide a testing ground for digital solutions and acts as a bridge between urban tech actors and rural farming communities.	Involve	needs further outreach



Agri-business - 100P+ organisation	TG7 - Ag-tech industry	Regional agri-business network. Can contribute user feedback, support piloting of solutions across various crop systems, and foster adoption at scale.	Involve	needs further outreach
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3.4.5 MAP CH

Section	Content
Region / Pilot Site	Switzerland
Lead Coordinating Organisation	AGROSCOPE
Contributing Organisations	UNIVERSITAET ST. GALLEN (HSG)
MAP Communication contact point	Hassan-Roland Nasser
Local Challenges of Demonstration site	Despite Switzerland's strong R&D ecosystem and supportive agricultural policies, challenges remain in addressing regional disparities in internet connectivity, which can hinder uniform digital adoption. Additionally, high wealth inequality may affect equal access to advanced technologies among farmers. Ensuring that innovation benefits a broad range of stakeholders—not just well-resourced farms—is essential for inclusive digital transformation.



TABLE 7: MAP CH

Organization, Institution	Assigned TG	Role & Potential Contribution (indicate their area of expertise, role of their works and their potential contributions to the project)	Engagement Level (Classify the stakeholder's influence and interest based on the matrix.)	Engagement Status at M12 (Indicate whether the stakeholder has been contacted, is actively engaged already, or needs further outreach)
ISF Institut für Intelligente Systeme und Smart Farming (OST)	TG2 – Research Institutions and Universities	Host the annual conference called "Innovations forum Ernährungswirtschaft"	Involve	Needs further outreach
Agricultural School Salez (SG)	TG2 – Research Institutions and Universities	Knowledge transfer and dissemination	Inform	Needs further outreach
Research station smart technologies (AGS + TG + SH)	TG2 – Research Institutions and Universities	Dissemination	Inform	Has been contacted
Agroscope (Earth Observation of Agroecosystems)	TG2 – Research Institutions and Universities	Satellite and remote sensing expertise; data provision and module design support	Inform	Has been contacted
Competence Centre for agriculture in Thurgau	TG6 – Agricultural Advisory Services	Agricultural training and advisory expertise; regional innovation liaison	Collaborate	Is actively engaged
Barto	TG6 – Agricultural Advisory Services	Implementation of smart farming tools; access to farmer users; digital infrastructure insight	Inform	Has been contacted



digiagrifood.ch	TG6 – Agricultural Advisory Services	Dissemination through website and conferences	Inform	Has been contacted
Agridea	TG6 – Agricultural Advisory Services	Knowledge transfer	Consult	Has been contacted
Agco	TG7 – Ag-tech Industry	Technology provider; equipment integration; private sector scaling partner	Inform	Needs further outreach
GVS-Agrar	TG7 – Ag-tech Industry	Agricultural Machinery Supplier; Technical deployment partner; interface for local ag-tech testing	Inform	Needs further outreach
Swiss Future Farm	TG9 – SMEs and Startups	Demonstration platform for precision agriculture; testbed for technologies; first contact point for data/premises	Collaborate	Is actively engaged



3.5 STAKEHOLDER ENGAGEMENT

A core element of the NOSTRADAMUS' MAA is the active and systematic engagement of stakeholders across all phases of the project lifecycle. The stakeholder engagement strategy is rooted in the principles of the MAA, ensuring that end users, practitioners, policy makers, researchers, advisors, and civil society actors contribute meaningfully to co-design, co-implementation, and co-evaluation activities.

Stakeholder engagement in NOSTRADAMUS operates on two levels:

- *Horizontal Layer: Project-Level Integration Across Work Packages*

At the project level, all WPs are responsible for applying the MAA wherever relevant, based on the project-wide stakeholder engagement guidelines. Engagement is not uniform across all tasks but instead is tailored to the scope, objectives, and needs of each task. Each WP identifies and interacts with its relevant stakeholder groups, enabling targeted consultations and meetings, as well as stakeholder involvement in co-creation processes.

- *Vertical Layer: Regional MAPs*

At the regional level, each demonstration site has established a MAP that serves as a local hub for stakeholder interaction. These MAPs bring together actors from across the agricultural knowledge and innovation system (AKIS), tailored to each pilot's local context. Through these MAPs, stakeholders are actively engaged in:

- Participating in regional workshops and demonstration events,
- Co-developing solutions and identifying local needs and barriers,
- Testing and providing feedback on digital tools and services,
- Participating in training sessions and knowledge-sharing activities.

This regional layer ensures that solutions are demand-driven, context-sensitive, and grounded in real-world challenges. This continuous feedback loop enhances knowledge sharing, informs the development of tailored digital solutions, and fosters the broader uptake and upscaling of innovations.

Stakeholder engagement efforts at both the project and regional levels are tracked using a dedicated set of Key Performance Indicators (KPIs), which serve as tangible measures of progress and alignment with the MAA principles.

3.5.1 KPI DEFINITION

To effectively monitor and evaluate the engagement outcomes of the NOSTRADAMUS project, a series of KPIs, aligned with the MAA principles, have been defined and formalized in the Grant Agreement. These KPIs serve as a strategic framework to measure the quality, scope, and impact of stakeholder involvement across all TGs and MAPs. The KPIs cover areas such as awareness-raising,



multi-actor collaboration, transnational synergies, training, knowledge sharing, and the uptake of project outcomes.

To ensure clarity and consistency a standardised KPI table has been developed. This table serves as both a planning and monitoring tool. It supports all project partners to monitor the engagement strategies and enables easy tracking of progress over time. Each row in the table represents an individual KPI, while the columns capture key information necessary for meaningful monitoring and reflection:

- **KPI:** Unique identifier for the KPI.
- **Indicator:** A brief, clear statement of what is being measured.
- **Measurement Technique:** The method used to collect data or evaluate the KPI (e.g., surveys, meeting attendance logs, etc.).
- **Current Value (M12):** The baseline or starting point value recorded at Month 12.
- **Target Value:** The intended value or outcome to be achieved by a specified point in time.
- **Impact Description / Rationale:** A concise explanation of the significance of the KPI—why it was chosen and how it supports the MAA.

To ensure that stakeholder engagement remains dynamic, accountable, and responsive to evolving project needs and activities, MAA KPIs in NOSTRADAMUS follow a structured lifecycle, directly aligned with the three key iterations of the MAA Strategic Plan. To facilitate a robust evaluation at each stage, the KPI tracking framework will be expanded over time. In D1.2, the KPI table will introduce three additional columns (TABLE 8) that allow for adaptive project management and transparent tracking of engagement performance:

- **Progress Value (M24):** Updated measurement of achievements by Month 24.
- **Status / Trend:** A qualitative assessment indicating the KPI's current trajectory (e.g., On Track, Delayed, Exceeded, or Emerging Risk).
- **Changes / Adjustments:** Explanation of any revisions made to the KPI, including methodological updates, adjusted targets, or strategy changes informed by experience and lessons learned.

To complement this framework, a new section will be added to capture “**Output / Result of Engagement**”, which will document the tangible outputs resulting from stakeholder engagement. This ensures the project does not only monitor activities (e.g., number of workshops), but also the qualitative results and co-created value that emerge from engagement.



Furthermore, **new KPIs may be defined throughout the project** as stakeholder needs, project activities, or external conditions evolve. Any newly defined KPIs will be formalized and reflected in the updated MAA Strategic Plan (Deliverable D1.2).

TABLE 8: UPDATED KPI TABLE **TEMPLATE** FOR FUTURE STRATEGIC PLANS

KPI	Indicator	Measurement Technique	Current Value (M12)	Target Value	Impact Description / Rationale	Progress Value (M24)	Status / Trend	Changes / Adjustments
Output / Result of Engagement								



3.5.2 STAKEHOLDER ENGAGEMENT KPIS

The following structured tables below present the project KPIs reflecting the MAA (Table 9-11), detailing their indicator, measurement technique, progress at M12, target value, and expected impact. These KPIs will be updated and further elaborated in Deliverables D1.2 (M24) and D1.3 (M48), reflecting evolving stakeholder engagement dynamics, achievements, and refinements throughout the project lifecycle.

The following three tables present the projects' KPIs structured according to the core phases of the MAA cycle: **co-creation, co-implementation, and co-evaluation.**



TABLE 9: CO-CREATION PHASE KPIS

KPI	Indicator	Measurement Technique	Current Value (M12)	Target Value	Impact Description / Rationale
1	Stakeholders in each of the developed MAPs	Number of stakeholder contacts per MAP	30 per MAP	30 per MAP	This KPI ensures that each of the five regional MAPs maintains a critical mass of diverse stakeholders to support place-based innovation, co-creation, and testing of digital tools. A strong and balanced stakeholder base enhances the representativeness and legitimacy of the MAPs and reflects the MAA by bringing together farmers, advisors, researchers, policy makers, SMEs, civil society, and IT providers. <i>(No personal information on stakeholders will be published in this report.)</i>
2	Conduct regular meetings with key stakeholders throughout the project lifecycle	Number of meetings or workshops with stakeholders	3	30	This activity ensures ongoing dialogue, co-creation, and responsiveness to stakeholder needs. Regular meetings will help align project activities with local realities, foster trust, and strengthen multi-actor collaboration.
3	Conduct stakeholder surveys addressing needs, challenges, and data requirements.	Number of completed surveys	0	<i>No fixed target; iterative collection across the five MAPs</i>	This KPI supports the early-stage identification of stakeholder priorities, expectations, and data needs across different regions and actor groups. The primary focus of the survey is on mapping stakeholder needs, particularly in relation to digital agriculture tools, data usage, and decision-support functionalities. Additionally, the survey includes selected questions on socio-economic aspects and post-project perspectives, providing insight into both immediate requirements and long-term



					adoption dynamics. The survey will be distributed across the five regional MAPs, ensuring broad coverage.
4	Workshops with 50 stakeholders	Count of workshops with at least 50 stakeholders in attendance	1	5	This activity facilitates co-creation, knowledge exchange, and cross-sector collaboration among a wide range of stakeholders engaged in digital agricultural innovation. The workshops aim to connect actors across the Quadruple Helix—land managers, advisors, researchers, policymakers, and industry representatives—within an inclusive and participatory setting. At least one workshop will be held in each of the five regional MAP countries.
5	Workshops with 50 stakeholders for identifying the needs-based requirements	Count of workshops for identifying needs-based requirements with at least 50 stakeholders in attendance	0	4	This KPI ensures broad and inclusive consultation for identifying needs-based requirements for digital tools, datasets, and functionalities. Each workshop will engage at least 50 stakeholders and be conducted in each MAP country (CY, DE, SL, SR, CH) to capture region-specific perspectives. The workshops are central to co-defining user requirements, ensuring tools are tailored to real-world contexts and can be adopted across different farming systems, geographies, and levels of digital maturity.



TABLE 10: CO-IMPLEMENTATION PHASE KPIS

KPI	Indicator	Measurement Technique	Current Value (M12)	Target Value	Impact Description / Rationale
6	Ensure demonstration events for demonstrating the core modules and the digital applications, with the presence of at least 10 stakeholders	Count of demonstration events held with the presence of at least 10 stakeholders	0	8	This activity aims to enhance stakeholder familiarity with project outputs in real-world settings. Demonstration events will promote hands-on engagement with core modules and digital tools, enabling practical feedback, peer exchange, and greater potential for adoption across regions. Five demonstration events will occur in each of the five regional MAPs, co-organized with local stakeholders to reflect context-specific use cases. Three demonstration events will be carried out by Third Parties.
7	Facilitate on-site visits of young scientists to demonstration sites	Log of young scientists' visit events	0	5	This activity supports the development of next-generation expertise by linking early-career researchers with field-based innovation. One on-site visit will be organized in each MAP, fostering knowledge exchange, practical learning, and collaboration between scientific and practitioner communities.
8	Deliver user-oriented training events incorporating food security and input independence topics	Number of trainings held	0	6	This activity aims to build capacity for sustainable and autonomous agricultural practices by delivering user-oriented training sessions. Trainings will primarily target land managers, farmers' associations, advisors, businesses, IT experts, and policymakers. To ensure broad accessibility and local relevance, training materials will be produced in English and translated into local languages.
9	Socio-Economic Assessment Survey	Number of completed surveys	0	Open-ended; based on data representativeness	This survey enables the collection of data on the socio-economic effects of NOSTRADAMUS digital tools. It will capture changes in digital skills, productivity, income, working conditions, and well-being among key stakeholder groups. The results will support a broader understanding of how digital innovation influences agricultural practices and rural livelihoods across regions.



10	Workshops with members from AKIS platforms	Count of AKIS-focused workshops held	0	3	This KPI ensures engagement with AKIS actors. The workshops will be conducted to enable AKIS actors to provide informed feedback and support to Third Parties joining through Open Call #2. This ensures that new entrants benefit from established knowledge networks and that the project fosters a scalable, system-integrated MAA.
11	Facilitate synergies between Target Groups across five MAPs to address common agricultural challenges	Documented examples of cross-MAP activities	0	5	This KPI reflects the integration of the MAA beyond regional boundaries by fostering cross-MAP collaboration among core stakeholder groups. Through joint online sessions, MAP actors will identify and exchange experiences on shared barriers, innovation opportunities, and best practices across diverse agricultural ecosystems.

TABLE 11: CO-EVALUATION PHASE KPIS

KPI	Indicator	Measurement Technique	Current Value (M12)	Target Value	Impact Description / Rationale
12	Stakeholder Feedback Survey on NOSTRADAMUS Outcomes	Number of completed surveys	0	<i>No fixed target; no strict limit</i>	This KPI ensures that stakeholders across sectors and regions have the opportunity to assess the usefulness, impact, and sustainability of NOSTRADAMUS outcomes. The survey focuses on collecting post-project insights regarding continued usability, adoption potential, and remaining gaps. This activity reflects the MAA by ensuring that final project assessments are grounded in stakeholder experience and expectations for future exploitation.



4 MAA ETHICAL CONSIDERATIONS AND RISKS

The MAA raises the following key ethical risks, that are considered in all engagement activities:

- **Data privacy and compliance**

The project uses multiple data sources, including sensitive IoT and geospatial data. Adhering to GDPR (General Data Protection Regulation) is critical to protect user privacy.

- **Intellectual Property (IP) management**

Collaborative innovation necessitates clear IP policies to fairly allocate rights and ensure shared benefits from project outcomes.

- **Data misuse**

The aggregation of socio-economic and agricultural data could be misused if not adequately protected (e.g. through data security protocols).

- **Transparent decision-making**

Open and transparent processes and clear communication (of objectives, methodologies, timelines etc.) are crucial to maintain trust among stakeholders.

- **Inclusive participation**

Ensure balanced and fair representation of marginalized groups, particularly those facing digital exclusion, limited digital literacy, or other socio-technical adoption barriers, and mitigate the risk of overrepresenting influential actors.

- **Post-project sustainability**

Measures to ensure long-term use and maintenance of developed tools and platforms need to be established.

- **Stakeholder fatigue**

Repeated engagements without clear relevance, objectives, and outcomes could lead to declining motivation, reduced participation, and erosion of trust in the co-creation process and outcomes.



5 MAA EVALUATION

To effectively monitor and evaluate the implementation of the MAA in the project, we have developed a structured, milestone-based KPI framework. The KPIs will follow a three-phase lifecycle, corresponding to the main MAA Strategic Plan deliverables:

- **D1.1 – MAA Strategic Plan (M12)**

An initial set of KPIs is defined, and baseline values are established where possible. These reflect early-stage stakeholder engagement efforts, including stakeholder identification, initial outreach, MAP formation, and workshop participation.

- **D1.2 – MAA Strategic Plan Update (M24)**

KPI values are updated to reflect progress since M12. Where relevant, new KPIs are introduced to reflect emerging priorities or challenges.

- **D1.3 – Final MAA Strategic Plan (M48)**

Final KPI values are reported, and a comprehensive evaluation of stakeholder engagement and multi-actor collaboration is conducted. This phase will also reflect lessons learned and recommendations for sustaining MAPs post-project.



6 CONCLUSION

Deliverable D1.1 marks a foundational milestone in the NOSTRADAMUS project by establishing a robust, actionable MAA Strategic Plan. This plan outlines the principles, structures, and tools needed to ensure that digital agricultural innovations are co-created with, and for, those most impacted by them—from farmers and advisors to policymakers, researchers, and civil society. Rooted in the concepts of Responsible R&I, HCD, Design Thinking, and Systems Thinking, the strategy ensures that engagement is inclusive, iterative, and impact-driven. The creation of five regional MAPs provides localized ecosystems for co-design, knowledge exchange, and validation of project outputs. These MAPs serve not only as demonstration sites but also as entry points for diverse voices, including marginalized and underrepresented groups—to help shape practical, scalable solutions.

To operationalize and monitor the MAA, a dedicated KPI framework has been developed. This framework ensures transparency, tracks engagement quality, and supports continuous learning and adaptation throughout the project lifecycle. Future updates to this plan—D1.2 (M24) and D1.3 (M48)—will reflect the evolving stakeholder landscape, capture lessons learned, and guide the long-term sustainability of MAPs and stakeholder partnerships.

Ultimately, this strategic plan positions NOSTRADAMUS to deliver open, interoperable, and user-friendly digital tools that are grounded in the needs, realities, and aspirations of Europe’s agricultural communities. It sets the stage for inclusive innovation, long-term adoption, and a lasting contribution to sustainable, data-driven agricultural transformation.



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