



**Building a European framework  
for the secure and trusted data space for agriculture**

## **D5.2: Sustainability Plan**

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## AgriDataSpace Consortium

	Participant organisation name	Short name	Country
1	AGDATAHUB	ADH	FR
2	FOODSCALE HUB GREECE ASSOCIATION FOR ENTREPRENEURSHIP AND INNOVATION ASTIKI MI KERDOSKOPIKI ETAIREIA	FSH	EL
3	INSTYTUT CHEMII BIOORGANICZNEJ POLSKIEJ AKADEMII NAUK	PSNC	PL
4	UNIVERSIDAD DE LLEIDA	UdL	ES
5	EIGEN VERMOGEN VAN HET INSTITUUT VOOR LANDBOUW- EN VISSERIJONDERZOEK	EV ILVO	BE
6	FONDAZIONE BRUNO KESSLER	FBK	IT
7	VDI/VDE INNOVATION + TECHNIK GMBH	VDI/VDE-IT	DE
8	STIFTUNG FACHHOCHSCHULE OSNABRUCK	HSOS	DE
9	STICHTING WAGENINGEN RESEARCH	WR	NL
10	1001 LAKES OY	1001 Lakes	FI
11	ASOCIATIA NATIONALA A INDUSTRIILORDE MORARIT SI PANIFICATIE DIN ROMANIA	ANAMOB	RO
12	COMITE EUROPEEN DES GROUPEMENTS DE CONSTRUCTEURS DU MACHINISME AGRICOLE	CEMA	BE
13	FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV	Fraunhofer	DE
14	AGRICULTURAL INDUSTRY ELECTRONICS FOUNDATION AEF	AEF	DE
15	FEDERATION NATIONALE DES SYNDICATS D'EXPLOITANTS AGRICOLES	FNSEA	FR

## Glossary of terms and abbreviations used

List of Abbreviations and Acronyms	
CEADS	Common European Agricultural Data Space
DSI(s)	Data Sharing Initiative(s)
DSSC	Data Spaces Support Centre
EC	European Commission
DG	Directorate-general
MOOC	Massive Open Online Courses

## Executive Summary

The sustainability plan of the AgriDataSpace project elaborates a strategic approach for the sustainability and wider impact of the Common European Agricultural Data Space (CEADS). This plan meticulously outlines the development of CEADS, which aims to use agricultural data to support decision-making and increase operational efficiency in the European agri-food sector.

A cornerstone of this plan is the emphasis on stakeholder engagement, using a methodical approach to ensure inclusive participation and collaboration. This is achieved through a **structured classification and strategic interaction with stakeholders**, which include a wide range of entities from farmers and agricultural producers to technology and data providers, research institutions, government bodies and more. **The plan recognises the importance of engaging these diverse groups to foster a collaborative ecosystem.**

It also concentrates on integrating sustainability into governance schemes, business models, and the ecosystem's roadmap. This is achieved by outlining how sustainability principles are woven into the governance and business models, ensuring that CEADS's operations are aligned with long-term environmental, economic, and social objectives. Furthermore, it goes into details on the ecosystem sustainability roadmap, emphasizing the deployment and operational strategies that incorporate sustainability checkpoints. These checkpoints ensure that CEADS progresses towards its goals while fostering a sustainable, data-driven agricultural future in Europe. This approach underscores the project's commitment to embedding sustainability at every level of its strategic development and operational execution.

The plan presents a **detailed trade-off analysis** that serves as a tool to navigate strategic choices related to governance flexibility, stakeholder alignment, and operational challenges. This analysis is essential for making informed decisions that balance different needs and priorities within the project, while aiming for alignment with EU policies.

The plan also emphasises the **importance of cross-sectoral collaboration** and details the engagement of the technology, education and sustainability sectors. This collaborative effort is seen as crucial to stimulate innovation within CEADS and ensure alignment with EU policy directions.

To enhance stakeholder dialogue and ensure that the project remains aligned with both stakeholder needs and innovation objectives, the plan introduces specific mechanisms. These include the establishment of a **monitoring and evaluation framework**, to oversee the project's progress through its development and operational phases, ensuring a path towards a collaborative and data-driven agricultural future in Europe.

In addition, the document reflects on **key lessons learned throughout the project**, highlighting the indispensable role of stakeholder engagement ecosystems in achieving project milestones. It recognises the complexities of managing a diverse stakeholder community and the strategies used to maintain an active and engaged network.

Looking ahead, the plan outlines **steps for future planning**, including the organisation of a closing event and the launch of a newsletter initiative. These steps are designed to continue to foster community dialogue and engagement, and to ensure continued momentum and interest in the development and implementation of CEADS.

By providing these detailed insights, the AgriDataSpace Sustainability Plan establishes a comprehensive and strategic framework that not only addresses the immediate needs of the CEADS project, but also sets a **precedent for future initiatives** aimed at the digital transformation of the agricultural sector within the European Union.

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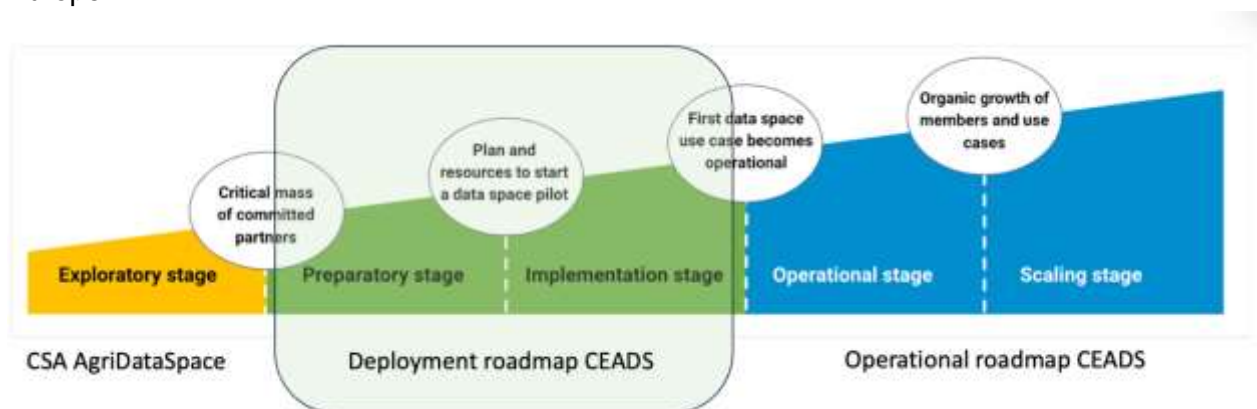
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# 1. Introduction

In the journey towards digital innovation in agriculture, the AgriDataSpace project is playing a fundamental role in establishing the **Common European Agricultural Data Space (CEADS)**, demonstrating a strategic move towards the integration of digital technologies across the agricultural sector. This initiative aims to catalyse a transformation that will improve data-driven decision-making and optimise the efficiency, sustainability and resilience of agricultural practices. By laying the groundwork for CEADS, AgriDataSpace is not only contributing to the digital ecosystem, but actively shaping it to ensure that it supports growth and facilitates the **long-term prosperity of the agricultural community** within the European framework.

An integral part of AgriDataSpace is the creation of a post-project sustainability plan that **examines the interplay between institutional, operational and financial aspects of CEADS**. This plan is forward-planning and aims to extend the reach and functionality of the network, while positioning it as a central platform for ongoing stakeholder dialogue. The initiative recognises the network as more than a technological framework; it sees it as a dynamic space for fostering the inclusivity and collaboration that is critical to the sustainable advancement of digital agriculture. The project seamlessly integrates sustainability into its governance and operational models, addressing the nuanced challenges and opportunities of digital transformation. With a roadmap marked by milestones in stakeholder engagement, innovation and feedback integration, AgriDataSpace is steering the agricultural sector towards a future that values connectivity, environmental stewardship and technological progress. The efforts of the initiative are central to achieving the goals of a digitised European agriculture and mark a significant step towards establishing CEADS as a cornerstone for sustainable and competitive agricultural practices in Europe.



**Figure 1 - Deployment phase of a data space initiative**

In order for AgriDataSpace to accurately map the complexity of the agricultural data landscape, this stakeholder segmentation, informed by expert analysis and insights from the Work Package 1 (WP1) survey on Data Sharing Initiatives (DSIs), ensures we address the diverse needs and perspectives of those impacted by our work:

1. **Farmers and Agricultural Producers:** They are at the core of the agricultural value chain, directly benefiting from data-driven insights to enhance productivity and sustainability.
2. **Technology and Data Providers:** Entities that offer innovative solutions, tools, and platforms, facilitating the collection, analysis, and utilisation of agricultural data.
3. **Data Intermediaries and Service Providers:** Organisations that play a crucial role in processing, storing, and making agricultural data accessible and actionable for end-users.



4. **Government and Regulatory Bodies:** These stakeholders set the legal and policy frameworks that govern the collection, use, and sharing of agricultural data, ensuring compliance and protection of stakeholders' interests.
5. **Financial and Insurance Services:** Firms that leverage agricultural data to offer tailored financial products, risk assessment, and insurance services to the agricultural sector.
6. **Research and Academic Institutions:** Centers of knowledge that conduct research to advance the understanding of agricultural data applications, contributing to the sector's innovation and education.
7. **Business and Industry Stakeholders:** Companies and organisations within the agricultural supply chain that use data to optimise operations, enhance product offerings, and drive sector growth.
8. **Multi-actor Collaborations:** Collaborative efforts involving various stakeholders that aim to foster innovation, share knowledge, and implement best practices in agricultural data usage.

The AgriDataSpace project has pioneered the creation of an innovative ecosystem designed to transform European agriculture through the strategic use of data. This ecosystem is built on the collaborative efforts of a diverse network of participants, each playing a crucial role in achieving the project's vision of digital transformation in agriculture. The ecosystem aims to foster innovation, sustainability, and interoperability among various stakeholders across the agricultural value chain. Here's a closer look at the key components of the AgriDataSpace ecosystem:

1. **Project Partners:** These are the backbone of the ecosystem, comprising research institutes, data intermediaries, and industry associations dedicated to pushing the boundaries of what's possible in agricultural data sharing and use.
2. **Advisory Board:** This group consists of seasoned experts who provide strategic guidance, ensuring the project's initiatives are both innovative and aligned with the sector's needs.
3. **Stakeholder Committee:** A dynamic assembly of actors from across the agricultural spectrum, including producers, agribusinesses, tech providers, and policy makers, who bring diverse perspectives and expertise to the table.
4. **Data Space Support Centre (DSSC):** Acts as the technical heart of the ecosystem, supporting data sharing, enhancing interoperability, and promoting best practices among various common data spaces.
5. **Member States:** They contribute national insights and ensure the ecosystem's efforts harmonise with national policies and local agricultural practices and challenges.
6. **European Commission (EC):** Its support underscores the ecosystem's alignment with the EU's broader goals for digital transformation and a unified data space across Europe.

Together, these elements comprise a vibrant ecosystem aimed at using data to drive forward the digital transformation of agriculture, ensuring it is sustainable, competitive, and aligned with European priorities.

**Interoperability** lies at the heart of effective data spaces. Consensus ensures compatibility between the different systems, protocols and standards used by stakeholders across the agricultural value chain. This paves the way for seamless data exchange and integration, unlocking new insights. But interoperability is only the beginning. To encourage the voluntary data sharing that is so critical to these initiatives, **trust** is essential. **Consensus helps to cultivate this trusted environment**, assuring stakeholders that their interests are protected and valued. With trust comes enthusiastic participation.

Furthermore, stakeholder consensus **aligns data spaces with Europe's complex and evolving regulatory landscape**. This proactive approach ensures compliance with GDPR and other data

protection laws, protecting the project and the individuals whose data it contains. Beyond technical and regulatory issues, the agriculture sector is facing numerous major challenges: climate change, food security and more. Consensus enables a unified strategy to address these complex issues, harnessing the power of shared data for shared benefit.

For CEADS to reach its full potential, the established ecosystem must be long-lasting and adaptable. A sustained ecosystem encourages ongoing innovation and continuous improvement, allowing the data space to remain **relevant and cutting-edge as technology evolves**. Sustainability also underpins scalability— as the data space grows, it must gracefully and inclusively accommodate an ever-increasing number of stakeholders and their unique datasets. This growth is fueled by a strong sense of community: actively engaged stakeholders contribute diverse viewpoints and expertise that shape problem-solving and adoption across Europe. Beyond the human factor, sustainability of the ecosystem necessitates ongoing resource allocation. Infrastructure, security, and exceptional user support must be continually funded and refined to meet the changing demands of the initiative. Finally, a thriving CEADS carries **influence**. The proven benefits of collaboration and data sharing can inform **policymakers**, leading to decisions that further advance agriculture's digital transformation.

# 1. AgriDataSpace Ecosystem

The AgriDataSpace ecosystem is a collaborative effort designed to transform European agriculture through the effective use of data. By carefully involving diverse stakeholder groups, the project lays a solid groundwork for consensus, ensuring all perspectives are considered. This approach builds trust and creates a robust data space that supports innovation.

As we explore the AgriDataSpace ecosystem – including project partners, the advisory board, stakeholder committee, Data Space Support Centre (DSSC), member states, and the European Commission (EC) – we see how each element plays a crucial role in enabling digital transformation within agriculture. This chapter will introduce the ecosystem's structure, emphasising the interdependent contributions of each part toward a future where data empowers sustainable, efficient, and competitive agricultural practices throughout Europe.

AgriDataSpace targets a wide audience, including policy makers and researchers, providing them with valuable insights and updates to shape the direction of the project. At the same time, it cultivates a collaborative ecosystem involving farmers, technology providers and government agencies who are actively engaged in sharing and using data to advance European agriculture. The key difference lies in their roles: the audience, external to the project, influences its development through feedback, while the ecosystem consists of engaged stakeholders who directly contribute to and benefit from the platform. Together, they ensure that AgriDataSpace keeps pace with agricultural innovation and meets the sector's data-driven objectives.

## 1.1. Project partners

This chapter introduces the diverse array of partners within the AgriDataSpace ecosystem. Each partner brings unique expertise and resources critical to the success of the project, from technological innovation to policy advocacy. This section outlines the roles and contributions of each organisation, highlighting how their collaborative efforts are laying the foundations for a sustainable and transformative European agricultural data space.

### 1.1.1. AGDATAHUB

Agdatahub



<https://agdatahub.eu/>

Agdatahub, serving as the project's coordinator, specialises in the management of digital agriculture projects and standardisation of agricultural data. Their profound expertise lies in developing and implementing comprehensive data management strategies that facilitate the secure and efficient exchange of agricultural data. In the AgriDataSpace project, Agdatahub plays a pivotal role in project management and coordination, leading Work Package 6. Their leadership ensures the project's strategic objectives are met, overseeing the integration of technological solutions and stakeholder collaboration.

### 1.1.2. FOODSCALE HUB

Foodscale Hub



Foodscale Hub Greece brings expertise in fostering entrepreneurship and innovation within the agrifood sector through technology. Their role in ecosystem building and stakeholder engagement is critical in bridging the gap between technological innovation and practical application in the agrifood industry. FSH's contributions to Work Package 5 which they lead

<https://foodscalehub.com/>

are critical, ensuring the project's advancements resonate well within the broader agrifood community.

### 1.1.3.PSNC

PSNC



<https://www.psnc.pl/>

The Polish Academy of Sciences' Institute of Bioorganic Chemistry (PSNC) is renowned for its research in semantic data models, data integration, and semantic interoperability. Their work in the AgriDataSpace project, particularly in Work Package 3, leverages their extensive knowledge in these areas to contribute to the development of a technologically robust agricultural data space. Their expertise ensures the project's technological framework is capable of supporting the complex needs of modern agriculture.

### 1.1.4.UNIVERSIDAD DE LLEIDA

UNIVERSIDAD DE LLEIDA



<https://www.udl.cat/ca/en/>

UNIVERSIDAD DE LLEIDA contributes its specialised knowledge in legal and ethical aspects of data sharing, alongside its research in data integration, to the AgriDataSpace project. Participating in Work Packages 2 and 4, UdL plays a key role in developing the project's roadmap, focusing on ensuring the agricultural data space adheres to rigorous ethical and legal standards. Their contribution is essential for creating a framework that respects data privacy and ethical considerations while promoting data sharing.

### 1.1.5.EV-ILVO

EV ILVO



<https://ilvo.vlaanderen.be/en/>

EIGEN VERMOGEN VAN HET INSTITUUT VOOR LANDBOUW-EN VISSERIJONDERZOEK (EV ILVO) brings to the project a robust expertise in the technical and business aspects of data sharing solutions in the agrifood sector. Leading Work Package 1 and contributing to Work Package 3, EV ILVO's insights are crucial for understanding and mapping the current landscape of data sharing. Their contributions ensure the project's outcomes are grounded in current practices and industry needs, facilitating the adoption of the agricultural data space.

### 1.1.6.FONDAZIONE BRUNO KESSLER

FONDAZIONE BRUNO KESSLER (FBK)



<https://www.fb�. eu/en/>

FONDAZIONE BRUNO KESSLER (FBK) stands at the forefront of research and innovation in agritech, focusing on developing guidelines for data spaces. As the lead of Work Package 3, FBK's contributions are pivotal in establishing the technical reference architecture for the agricultural data space. Their expertise not only enriches the project's technological framework but also ensures it is adaptable and scalable to future technological advancements and industry demands

### 1.1.7. VDI/VDE INNOVATION + TECHNIK GMBH

VDI/VDE-IT



<https://vdivde-it.de/en/references>

VDI/VDE INNOVATION + TECHNIK GMBH (VDI/VDE-IT) specialises in developing multi-stakeholder governance schemes and roadmapping methodologies. Their contributions to Work Packages 2 and 4 are instrumental in crafting governance models that are inclusive and efficient. Their expertise in navigating complex stakeholder landscapes ensures the project's governance framework is robust, transparent, and capable of fostering collaboration across the agricultural sector.

### 1.1.8. STIFTUNG FACHHOCHSCHULE OSNABRUCK

HSOS



<https://www.hs-osnabrueck.de/en/>

STIFTUNG FACHHOCHSCHULE OSNABRUCK (HSOS) brings a wealth of knowledge in agriculture systems engineering and digital agriculture. Their expertise is pivotal in evaluating and applying technological approaches within the AgriDataSpace project, particularly contributing to Work Package 3. HSOS's focus on integrating cutting-edge digital technologies into agricultural practices enriches the project's technological framework, ensuring it meets the dynamic needs of the agriculture sector.

### 1.1.9. STICHTING WAGENINGEN RESEARCH

Wageningen Research



<https://www.wur.nl/>

STICHTING WAGENINGEN RESEARCH (WR) is a global leader in digital innovation for sustainable food systems and data infrastructures. Leading Work Package 2 and participating in Work Package 3 and 6, WR's expertise in digital ethics and sustainable agriculture practices is crucial. Their leadership in developing governance models that balance profitability with responsibility sets a benchmark for future agricultural data spaces, emphasising sustainability and ethical considerations.

### 1.1.10. 1001 LAKES OY

1001 Lakes Oy



<https://1001lakes.com/>

1001 LAKES OY specialises in guiding digital transformation and crafting data economy rulebooks. As the lead of Work Package 4, their expertise is instrumental in developing a comprehensive and actionable roadmap for the European agricultural data space. Their contributions ensure that the project's outcomes are aligned with broader objectives of digitalization in agriculture, promoting interoperability, data sharing, and innovation.

**1.1.11. ANAMOB**

ANAMOB

<https://anamob.ro/>

ASOCIATIA NATIONALA A INDUSTRIILORDE MORARIT SI PANIFICATIE DIN ROMANIA (ANAMOB) leverages its expertise in automation, computer sciences, and the agrifood sector to support the AgriDataSpace project. Their involvement across multiple Work Packages (1, 2, 5, and 6) brings valuable insights into the technological and policy dimensions of the project. ANAMOB's contributions facilitate the integration of advanced technologies and effective policy recommendations within the agricultural data space.

**1.1.12. CEMA**

CEMA

<https://www.cema-agri.org/>

CEMA (COMITE EUROPEEN DES GROUPEMENTS DE CONSTRUCTEURS DU MACHINISME AGRICOLE) contributes its specialised knowledge in bio-engineering, communication, and research management in agriculture machinery to the project. Their support across Work Packages 1, 4, 5, and 6 enriches the project with insights into agricultural machinery and technology's role in modern farming. CEMA's involvement ensures that the project's technological and policy frameworks are inclusive of advancements in agricultural machinery, fostering innovation and efficiency

**1.1.13. FRAUNHOFER**

FRAUNHOFER

<https://www.fraunhofer.de/en.html>

FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV is renowned for its excellence in software and systems engineering in agriculture, digital ecosystems, and data economies. Co-leading Work Package 3, Fraunhofer's expertise underpins the development of a scalable, interoperable architecture for the agricultural data space. Their contributions are vital for ensuring the technical infrastructure supports a wide range of digital agriculture applications, enhancing productivity and sustainability.

**1.1.14. AGRICULTURAL INDUSTRY ELECTRONICS FOUNDATION**

AEF

<https://www.aef-online.org/home.html>

The AGRICULTURAL INDUSTRY ELECTRONICS FOUNDATION AEF, with its focus on electrical engineering and agriculture electronics, supports Work Package 4. AEF's expertise in developing standards and databases for agricultural electronics is crucial for integrating digital tools and technologies into the agricultural data space. Their work ensures that the project's technological solutions are accessible, standardised, and beneficial across the agricultural sector.

### 1.1.15. FNSEA

FNSEA



<https://www.fnsea.fr/>

FEDERATION NATIONALE DES SYNDICATS D'EXPLOITANTS AGRICOLES (FNSEA) brings a profound understanding of agriculture law, agronomy, and economy to the project, leading a task in Work Package 2 and involved in Work Package 1. Their expertise in agricultural union management, climate change, food sovereignty, and balanced land use informs the project's approach to creating a legal and operational framework that supports sustainable agricultural practices. FNSEA's contributions ensure that the agricultural data space is grounded in a deep understanding of the sector's needs and challenges, promoting resilience and sustainability

## 1.2. Workshops participants

This chapter outlines a series of workshops conducted by AgriDataSpace to **collaboratively refine, improve and validate** the different building blocks (e.g. legal aspects, technical considerations, governance models, business models, code of conduct) for the future CEADS. These workshops brought together a diverse range of stakeholders from different sectors, facilitating an exchange of insights that informed the development of a secure, efficient and ethical data sharing environment. The collective expertise of the participants played a crucial role in steering the strategic direction of the project.

A series of **7 workshops were organised to collect experiences on the Code of Conduct** and interplay with the Data Act and DGA, and to have open discussions on the requirements and visions of the CEADS. These workshops took place during the month of April 2023 and gathered a wide range of different stakeholders in attendance, with a total of 99 participants. The workshops took place in persons in various locations to fulfil the need for both national and transnational viewpoints.

The online workshop "**Co-designing Collaborative Business Models for the Common European Agricultural Data Space**", hosted by FSH, attracted a diverse group of **101** stakeholders, providing a wide range of perspectives and expertise. Participants were spread across key categories, ensuring a diverse discussion: those directly involved in the cultivation and production of agricultural goods, technology experts offering data-driven solutions, service providers acting as intermediaries in data exchange, and authorities responsible for governance and regulatory oversight. While the financial and insurance services sector was not represented, the academic and research community was particularly active and provided substantial input. The workshop also benefited from the presence of stakeholders engaged in multi-stakeholder cooperation, which is essential for cross-sector integration, and a participant from an additional category, ensuring a well-rounded assembly to co-design the business models for CEADS.

AgriDataSpace actively participated in the Synergy Days event in Thessaloniki from October 4th to 5th, 2023 (>350 participants), with a strong presence and three workshops:

- The workshop "**Validating and Updating the Governance and Business Models for the Future CEADS**" facilitated essential discussions on creating a reliable, multi-stakeholder environment conducive to secure data exchange and robust business operations. This workshop aimed to refine the governance and business models for CEADS, ensuring they are both robust and applicable for future requirements of trustworthy and sovereign agricultural data sharing.

- Another workshop titled "**Ethical Aspects of Data (self)-Sovereignty in Data Spaces**" concentrated on how individuals and organisations can maintain control over their data within data spaces while addressing the potential ethical challenges and conflicts that may arise.
- The "**Technical Considerations for Data Spaces in Agriculture**" workshop provided a venue to address the technological hurdles in building an effective Data Economy in the Agricultural Sector. Here, the focus was on bridging the gap between current data system fragments and moving towards a unified vision, enabled by technology, that can serve as a solid foundation for the future agricultural data space.

### 1.3. Advisory board

The Advisory Board within the AgriDataSpace project acts as a central body, bringing together up to 10 independent experts from both the private and public sectors. The Board plays a critical role in providing top-down recommendations and insights that influence the project deliverables. Its members are tasked with scrutinising deliverables, such as the roadmap produced by Work Package 4 (WP4), to ensure that the fundamental principles underpinning the agricultural data space are not only maintained, but also optimised. As a consultative body, the Advisory Board's evaluations are instrumental in refining the strategic direction of the project, ensuring that it effectively addresses the complexities and nuances of the agricultural sector. Participation in the Advisory Board is an opportunity to help shape the future of European agriculture and have a direct impact on the transformation of the sector.

### 1.4. Stakeholder Committee

The committee serves as an advisory group, bringing together stakeholders with diverse expertise within the agricultural sector to discuss specific proposals identified by the consortium members. This collaborative approach ensures a rich exchange of perspectives on designing the key principles of the agricultural data space. The Stakeholders Committee will gather 20 to 30 people that includes key agri-food and technological players. Particular attention will be paid to the representativeness of stakeholder profiles based on the categorisation done by the business models analyse in the task 2.2.

The Stakeholder Committee attended two meetings to discuss the project proposals and share the different interests of the agricultural players.

### 1.5. DSSC

Throughout the development of CEADS during the lifetime of AgriDataSpace and its engagement with the Data Spaces Support Centre (DSSC), a total of 23 key meetings and workshops were held. These meetings ranged from technical discussions on the technology canvas and legal issues, to feedback loops between thematic groups and strategic planning for CEADS. This series of meetings underlines the project's comprehensive approach to incorporating feedback from different stakeholders and aligning with broader goals for digital agriculture in Europe, and underlines the project's commitment to building a consensus-driven and sustainable ecosystem for the future development of CEADS.

The DSSC plays a crucial role within the AgriDataSpace ecosystem. Its expertise in data space development, technical infrastructure and governance models ensures that the project is in line with the European Commission's vision for interoperable, secure and user-friendly data spaces. The DSSC's feedback helps to refine the AgriDataSpace approach, ensuring compatibility with existing and emerging data initiatives across different sectors. This collaboration is essential to build a truly connected and impactful CEADS.



## 1.6. Member states

The series of webinars on the Common European Agricultural Data Space (CEADS) provided a structured and collaborative forum for Member State engagement and feedback, progressively building a comprehensive framework for agricultural data management in the EU.

**Webinar 1** (27/09/2023) focused on introducing the AgriDataSpace project, outlining the European Strategy for Data and discussing opportunities and challenges in the use of agricultural data. It set the stage for feedback from Member States on their experiences with data sharing and the envisaged structure and governance of CEADS.

**Webinar 2** (17/10/2023) explored interim findings on governance and business models for CEADS, as well as an overview of EU-level initiatives and the impact of the Data Act on agricultural data. It encouraged Member States to reflect on governance models, incentives for data sharing and the balance between data protection and utility.

**Webinar 3** (30/10/2023) focused on the EU Code of Conduct on agricultural data sharing, exploring its interaction with the Data Act and the Data Governance Act, and proposing technical requirements for CEADS. It facilitated discussions on Member States' experiences with the Code of Conduct and the technical and legal framework underpinning CEADS.

**Webinar 4** (23/11/2023) concluded the series with a comprehensive "Tour de Table", allowing Member States to share their comprehensive views on the development of CEADS. It culminated in the presentation of a roadmap for CEADS, the discussion of next steps and the presentation of the methodology and expected outcomes of the collaborative process, highlighting the participatory approach in shaping the future of agricultural data management in the EU.

The participation of Member States in the CEADS development through the AgriDataSpace webinars has been a cornerstone of the project's progress. Their feedback has not only informed the current developmental phase but also presented avenues for reapplication and further improvements as the CEADS evolves. This collaborative effort highlights the EU's commitment to creating a cohesive, comprehensive, and inclusive data space that meets the varied needs of its agricultural sector.

## 1.7. EC

The European Commission (EC) plays a critical role in AgriDataSpace's ecosystem, primarily by providing foundational support, funding, and strategic guidance to align the project with EU policies. Through continuous consultations and feedback, the EC influences the project's development strategies, especially in stakeholder engagement and governance. This feedback ensures the project's approach is inclusive, representing a broad spectrum of the agricultural sector, and adapts to evolving needs and recommendations.

The EC's involvement helps in refining methodologies, stakeholder mapping, and enhancing project impact, underlining its pivotal position in guiding AgriDataSpace towards achieving its objectives while ensuring alignment with broader EU goals in agriculture and data economies.

## 1.8. Conclusion and critical numbers

This chapter emphasises the crucial role of the ecosystem in guiding the future development of CEADS. It details the contributions of project partners, the advisory board, workshop participants, and collaborations with the DSSC, Member States, and the European Commission. These diverse stakeholders provide invaluable feedback and expertise, shaping the project to meet the real-world needs of the agricultural sector.

Structured workshops foster a collaborative environment, gathering input from farmers, researchers, and policymakers. This ensures CEADS addresses practical challenges and aligns with the sector's evolving demands.

The advisory board and stakeholder committee further refine project deliverables, bringing insights from independent experts and key agricultural segments.

Collaboration with the DSSC, Member States, and the EC demonstrates the project's commitment to both European priorities and the broader agricultural data landscape.

This alignment will be critical for CEADS to successfully contribute to initiatives like the European Green Deal and Farm to Fork Strategy.

**Table 1 - AgriDataSpace Ecosystem**

Ecosystem Role	Involved Participants
Consortium Partners	15
Advisory board	10
Stakeholder Committee	17
DSSC Participants	>250
Workshops Participants	>320

AgriDataSpace was also in close contact with the European Member States and the European Commission's DGs Agriculture and Rural Development (AGRI), Communications Networks, Content and Technology (Connect), Health and Food Safety (SANTE). Based on frequent meetings, a series of discussions were made about the project progress and its alignment with the identified objectives.

In total, it is estimated that over 20.000 relevant actors were informed about the project and its goal in creating the framework of the CEADS.

**Table 2 - AgriDataSpace Audience**

Action	Engaged Audience
Stakeholders engaged in events	15,000 (approximate)
Social Media followers	1.456
Newsletters subscribers	653
Website unique visitors	3,300
Stakeholders received AgriDataSpace printed material	2,100

## 2. Governance Schemes and Business Models Integration

Building upon the governance schemes and business models developed in D2.1, we will examine their role in enhancing the engagement of the network that has been created. This exploration will focus on understanding the mechanisms through which **stakeholders are given continuous incentives to participate and engage with the CEADS**, encouraging their continued involvement and commitment. By analysing the structures and strategies put forth in D2.1, we aim to identify how they contribute to fostering a **collaborative environment**, ensuring stakeholders not only participate actively but also **benefit significantly** from their engagement. This examination will shed light on the critical elements that underpin stakeholder motivation and the sustainable growth of the agricultural data space network. A short description of multi-sided business models and multi-stakeholder governance schemes follows.

**Multi-sided business** models are a cornerstone of modern digital platforms, particularly in the agricultural sector. These models facilitate interactions between **different user groups** or stakeholders, creating **value through the exchange of services, information or goods**. For example, a digital platform that connects farmers with suppliers of agricultural machinery, data analytics services and marketplaces for their products operates on a multi-sided business model. The essence of such models lies in their ability to **harness network effects**, where the value of the platform to each group of users increases as more participants from each side join the ecosystem.

The agricultural sector, with its rich and diverse stakeholder ecosystem, provides an ideal landscape for the deployment of multi-sided business models. These models can meet the diverse needs of farmers, agritech companies, data analysts, regulators and consumers by providing a common platform for data exchange, services and commerce. The success of these models in agriculture depends on creating a **balanced value proposition for all stakeholders**, ensuring **data privacy and security, and facilitating seamless interoperability** between different digital tools and platforms.

The governance of agricultural data spaces is pivotal in ensuring that the data sharing ecosystem operates transparently, equitably, and efficiently. **Multi-stakeholder governance refers to the frameworks and structures that manage how decisions are made within the data space**, taking into account the interests, responsibilities, and contributions of all parties involved. This includes farmers, agritech firms, researchers, government agencies, and NGOs, among others. Effective governance in agricultural data spaces is rooted in several fundamental principles: inclusivity and fair representation to ensure all stakeholder groups have their interests adequately represented; transparency in rules, policies, and decisions to foster trust and collaboration; prioritisation of data sovereignty and privacy to protect individual and corporate data rights in compliance with legal and ethical standards; flexibility and scalability to adapt to evolving technologies, regulatory changes, and shifting stakeholder needs; and robust mechanisms for collaboration and conflict resolution to facilitate cooperation and address disputes efficiently. These principles collectively establish a governance framework that supports the dynamic nature of agricultural data ecosystems, ensuring their long-term viability and effectiveness.

### 2.1. Governance Schemes of the CEADS: Enhancing stakeholder engagement

In designing the CEADS within the AgriDataSpace project, the governance arrangements have been tailored to ensure an **engaging and sustainable framework for all stakeholders**

**involved.** By integrating multi-stakeholder governance bodies into the core structure, the project has made a clear commitment to inclusive and representative decision-making. This approach, which emphasises the voices of a diverse group of stakeholders from farmers to policy makers, ensures that the governance of CEADS reflects the wide range of needs and expectations across the agricultural data ecosystem.

A notable aspect of these governance bodies is the adoption of a **consensus-based decision-making process**. This method fosters a **collaborative environment** where decisions are the result of extensive discussion and mutual agreement, rather than majority rule. Such a process not only increases stakeholder buy-in, but also underscores the value of each stakeholder's contribution to the collective decision-making process, ensuring that their participation is meaningful and effective.

Recognising the dynamic landscape of agriculture and digital data, the governance framework has been deliberately designed to be **both flexible and scalable**. This strategic choice ensures that as technology advances and stakeholder needs evolve, the governance structure can adapt accordingly. The inclusion of **new stakeholders and the ability to respond to changes in the regulatory environment** are inherent in this adaptable governance model, which will enhance the relevance and effectiveness of CEADS over time.

**Transparency** is another cornerstone of the governance arrangements, with open channels of communication established to ensure that all stakeholders are well informed about the workings of CEADS. Regular dissemination of information, coupled with platforms for open dialogue, ensures that stakeholders are not just participants, but actively involved in the governance process. This level of openness is crucial for building trust and maintaining a high level of engagement across the network.

Furthermore, the introduction of robust **conflict resolution mechanisms** within these governance systems underlines the project's commitment to maintaining a harmonious and collaborative ecosystem. Recognising that conflicts may arise, these mechanisms ensure that when disputes do arise, they are resolved in a manner that is fair and respectful of the interests of all parties involved. This not only validates stakeholder concerns, but also maintains the collaborative spirit that is essential to the success of CEADS.

In summary, through these carefully considered choices in its governance arrangements, the AgriDataSpace project has laid a **solid foundation for stakeholder engagement within CEADS**. The **inclusive** nature of the governance bodies, the **consensus-based** approach to decision-making, the **adaptability** of the governance framework, the commitment to transparency and the establishment of conflict resolution mechanisms all contribute to an environment in which stakeholders not only have a voice, but also a real stake in the ongoing development and success of CEADS. This strategic approach ensures long-term stakeholder engagement and commitment, which is essential for the vitality and sustainability of the agricultural data space.

## 2.2. Business Models of the CEADS

The development process of the CEADS within the AgriDataSpace project has been characterised by a **co-design process aimed at directly engaging stakeholders** across Europe to co-design business and revenue models, value propositions and the distribution of costs and benefits. This approach has established the basic collaborative framework of CEADS, as evidenced by the results of the two key workshops involving a wide range of European stakeholders. These sessions were crucial in validating the Service Dominant Business Model Radar (SDBM/R), a tool chosen for its emphasis on mutual ethical benefit and the design of business models that take into account the financial and non-financial benefits of each actor involved in CEADS. The process was characterised by an interactive and consensus-driven

approach, which ensured that the components and design steps of the SDBM/R - ranging from the benefits and value propositions of the actors to the co-production activities and identification of the co-creation actors - were **carefully reviewed and agreed by the stakeholders**.

The first cycle of business model development, captured through an external online consultation workshop, was instrumental in gathering stakeholder insights on the SDBM/R. This workshop facilitated a collaborative dialogue with participation from different stakeholder categories across Europe, including farmers, technology and data providers, and research and academic institutions. The feedback from this session highlighted the **different value propositions that are considered critical by different stakeholder groups**, in particular data-driven innovation and sustainable agricultural practices. This diversity of stakeholder preferences underscored the need for a business model that is **adaptable and inclusive enough to address the wide range of needs within the agricultural sector**. In addition, the workshop provided clarity on stakeholders' views on the **equitable distribution of costs and benefits**, with a large majority in favour of a distribution proportional to each participant's contribution to CEADS.

Building on the findings of the first workshop, the second cycle of business model development further refined these concepts through a face-to-face session. This session, which took place during a major conference **bringing together digital innovators** in the European agri-food sector, provided an opportunity for stakeholders to deepen their perspectives on business and revenue models, as well as the envisaged services of CEADS. Participation from almost all stakeholder categories provided a comprehensive view of the network's needs, guiding the proposal towards services that enhance value creation and stakeholder collaboration within the agricultural data ecosystem.

In addition, the engagement process highlighted the essential role of **validating the proposed business models and services with external stakeholders**. This validation phase, which incorporated feedback from workshops, EU Member States and the Data Spaces Support Centre, was crucial in ensuring that the business models were aligned with the evolving needs of stakeholders and the overarching objectives of the agricultural sector. This iterative feedback mechanism has enabled the project to adapt and refine its business models, ensuring that they are robust, inclusive and capable of fostering a collaborative and sustainable agricultural data ecosystem.

The engagement and validation processes undertaken by the AgriDataSpace project have not only given stakeholders a **tangible stake in CEADS** but have also fostered a sense of **ownership and commitment among them**. By actively involving stakeholders in the co-design and refinement of the business models, the project has ensured that CEADS is built on a foundation of shared values, mutual benefits and collective responsibility. This approach has significantly enhanced stakeholder engagement, ensuring their continued involvement and support for a data space that promises to transform European agriculture through innovation, collaboration and sustainability.

### 3. Ecosystem Sustainability Roadmap

The development of the roadmap for the deployment and operation of the CEADS has involved a multi-faceted approach, with a particular focus on building consensus among stakeholders. This process is essential to ensure that the proposed governance arrangements and operational frameworks meet the **diverse needs of the agricultural data ecosystem** and encourage the active participation of all stakeholders. Below is an analysis focusing on the consensus building strategy as outlined in the provided document.

#### 3.1. AgriDataSpace Roadmap

##### Deployment phase

**Macro level:** This phase involves the basic set-up of CEADS, starting with the establishment of shared governance among the Lighthouse Data Sharing Initiatives (DSIs). These DSIs, selected on the basis of geographical representativeness, neutrality and compliance with CEADS standards, are crucial to ensure the **representativeness and neutrality of the data space**. A common governance framework will be developed to promote partnership, equity, accountability and ownership among stakeholders. The framework is also designed to be consistent with **European legal and technical frameworks**, laying the foundation for a robust and compliant data space. Table 2 shows activities of the macro level of the deployment phase and relevant strategies that could be utilised to build consensus.

**Table 3 - Activities and consensus-building strategies - Deployment phase macro level**

Activity	Consensus Building Strategy
<p><b>Establishment of Shared Governance:</b> Implement a temporary governance structure by engaging key lighthouse Data Sharing Initiatives (DSIs) to facilitate quick decision-making and flexibility.</p>	<p>Initiate a <b>multi-stakeholder forum</b> comprising representatives from key DSIs, industry experts, policy makers, and farmers. Utilise facilitated workshops and roundtable discussions to co-create a provisional governance model that emphasises transparency, inclusivity, and adaptability.</p>
<p><b>Selection of Lighthouse DSIs:</b> Use transparent criteria to select DSIs that ensure geographical representativity, neutrality, and compliance with CEADS standards.</p>	<p>Implement an <b>open call for DSIs with a clear, published criteria checklist</b> focusing on geographical diversity, technical readiness, and commitment to open standards. Use peer review and public consultations to validate selections, ensuring community endorsement and broad support.</p>
<p><b>Development of a Common Governance Framework:</b> Develop and agree upon a governance framework that emphasises partnership, equity, accountability, and ownership among stakeholders.</p>	<p>Host <b>collaborative design sprints involving diverse stakeholders</b> to draft the governance framework. Use consensus-building tools such as Delphi method for collecting and synthesising feedback, ensuring the framework reflects a balance of interests and priorities.</p>

**Micro level:** At the micro level, the deployment phase focuses on aligning individual DSIs with the technical, governance and legal expectations of CEADS. Activities include workshops and training to **familiarise stakeholders with the necessary frameworks and compliance requirements**. The aim is to ensure that all participating DSIs and other stakeholders are fully prepared to work with CEADS, facilitating a smooth transition to operational status. Table 3 shows activities of the micro level of the deployment phase and relevant strategies that could be utilised to build consensus.

**Table 4 - Activities and consensus-building strategies - Deployment phase micro level**

Activity	Consensus Building Strategy
<p><b>Alignment with Legal and Technical Frameworks:</b> Conduct workshops and training sessions to align stakeholders with the European legal framework and CEADS technical requirements.</p>	<p>Organise sector-specific webinars and interactive training sessions to demystify the legal and technical requirements of CEADS. Include case studies and best practices to illustrate compliance pathways and facilitate knowledge sharing and alignment.</p>
<p><b>Preparation for Onboarding:</b> Develop guidelines and support mechanisms for DSIs and other stakeholders to ensure smooth integration into the CEADS.</p>	<p>Develop a <b>comprehensive onboarding toolkit</b>, co-created with early adopters of CEADS, including checklists, FAQs, and template agreements. Offer personalised consultation sessions for DSIs to navigate the onboarding process, fostering a supportive integration environment.</p>

**Operational phase**

**Macro level:** Once the foundational elements have been established in the deployment phase, the operational phase transitions CEADS from a shared governance model to a fully functional Network Administrative Organisation (NAO). This shift marks the maturation of CEADS into an operational data space with a clear organisational structure and defined roles for management and coordination. The operational phase also focuses on testing, validating and refining CEADS components, demonstrating successful use cases and developing strategies for scalability and expansion. This includes exploring new use cases and expanding the network of participating DSIs. Table 4 shows activities of the macro level of the operational phase and relevant strategies that could be utilised to build consensus.

**Table 5 - Activities and consensus-building strategies - Operational phase macro level**

Activity	Consensus Building Strategy
<p><b>Transition to Network Administrative Organization (NAO):</b> Formalise the governance structure of CEADS by establishing the NAO to manage and coordinate activities effectively.</p>	<p>Conduct an <b>iterative review process</b> with current governance participants and external advisors to refine and ratify the NAO structure. Implement a phased transition plan with clear milestones and feedback loops to ensure seamless governance evolution.</p>
<p><b>Testing and Validation of CEADS Components:</b> Conduct collaborative testing with DSIs to refine technical solutions and governance processes, using successful use cases as examples.</p>	<p>Launch pilot projects with participating DSIs to test CEADS components under real-world conditions. Use <b>collaborative platforms to share outcomes</b>, challenges, and lessons learned, facilitating a continuous improvement culture.</p>
<p><b>Expansion and Scalability:</b> Develop and implement strategies for scaling CEADS, exploring new use cases, and expanding the network of participating DSIs.</p>	<p>Host annual CEADS innovation forums to explore new use cases and expansion opportunities. Implement a dynamic framework for integrating new DSIs, including scalability assessments and integration support services.</p>

**Micro level:** At the micro level, the operational phase emphasises the onboarding of additional DSIs, providing guidance and support to facilitate their integration into CEADS. A mentoring programme may be used to help new DSIs navigate the CEADS landscape. Ongoing dialogue with stakeholders is essential to adapt to evolving needs and ensure that CEADS remains

responsive and relevant to the agricultural sector. Table 5 shows activities of the micro level of the operational phase and relevant strategies that could be utilised to build consensus.

**Table 6 - Activities and consensus-building strategies - Operational phase micro level**

Activity	Consensus Building Strategy
<p><b>Onboarding of Additional DSIs:</b> Create and implement a comprehensive onboarding process for new DSIs, including guidelines, support, and possibly a mentorship program.</p>	<p>Establish a <b>mentorship program</b> pairing new DSIs with experienced participants. This will provide a structured yet flexible support system, enhancing the onboarding experience through shared knowledge and best practices.</p>
<p><b>Continuous Stakeholder Engagement:</b> Maintain an ongoing dialogue with stakeholders to ensure CEADS adapts to evolving needs and remains relevant to the agricultural sector.</p>	<p>Utilise <b>digital engagement platforms</b> to host regular update sessions, open feedback channels, and thematic discussion forums. Encourage active participation through gamification and recognition of contributions, ensuring CEADS remains aligned with stakeholder needs.</p>
<p><b>Farmers Perspective:</b> Develop intuitive platforms and provide guidance to help farmers navigate CEADS.</p>	<p>Host <b>interactive workshops</b> and feedback sessions with farmers to incorporate their input into platform design and functionality, ensuring it meets their needs and preferences.</p>
<p><b>Industry Perspectives:</b> Foster an environment for businesses to innovate and develop new applications using CEADS data.</p>	<p>Establish <b>industry working groups</b> to identify <b>key data needs</b> and innovative use cases, promoting collaborative development efforts that benefit the entire sector.</p>
<p><b>Governmental Perspective:</b> Utilise CEADS data to inform policy-making and ensure compliance with agricultural regulations.</p>	<p>Create <b>policy advisory committees</b> including government representatives, farmers, and industry stakeholders to ensure that data use aligns with regulatory requirements and supports policy making.</p>
<p><b>Data Intermediary Perspective:</b> Position data intermediaries as key facilitators in the data exchange process.</p>	<p>Organise <b>roundtable discussions</b> between data intermediaries, data providers, and data users to align on data sharing protocols, security standards, and intermediary services that add value.</p>
<p><b>Value Proposition for CEADS:</b> Offer a single platform for accessing a wide range of agricultural data.</p>	<p>Conduct joint value proposition workshops with diverse stakeholders to highlight the benefits of CEADS and gather insights on enhancing its value for all participants.</p>
<p><b>Building Trust in CEADS:</b> Establish clear policies on data usage, security measures, and privacy protections.</p>	<p>Implement transparent governance structures and regular communication channels to share updates on data governance policies, address concerns, and build a culture of trust within CEADS.</p>

### 3.2. Multi – actor approach

The CEADS Roadmap takes a **multi-stakeholder approach**, recognising the complexity of the agricultural sector and the need for collective solutions. This approach involves farmers, industry players, government agencies and data intermediaries from the earliest stages. It fosters collaboration, trust and innovation by prioritising transparency, security, privacy and consensus-building mechanisms such as workshops, advisory committees and feedback sessions. This



inclusive process ensures that diverse insights shape the development of the platform, addressing industry challenges and fostering a shared sense of ownership.

The effectiveness of the multi-actor approach rests on its ability to harmonise diverse stakeholder interests and contributions. CEADS prioritises **inclusivity by ensuring representation** from smallholder farmers, agribusinesses, technology providers, and policymakers, thus **addressing a broad spectrum of challenges and opportunities** within the agricultural data space. Its phased implementation approach offers **flexibility**, allowing for adjustments based on emerging challenges and stakeholder feedback to meet the sector's evolving needs. Finally, the collaborative environment fostered by the multi-actor approach encourages **idea sharing and resource pooling**, making it a hotbed for innovation in technologies, practices, and business models.

While the multi-actor approach offers significant benefits, its implementation isn't without **challenges**. A key challenge is balancing the **diverse interests of stakeholders with varying objectives and levels of influence**; ensuring equitable participation to **prevent dominance by powerful entities** is crucial for the integrity of CEADS. Additionally, the involvement of multiple stakeholders makes coordination complex, requiring effective governance structures and clear communication channels. Finally, **sustaining active engagement** throughout development and operation demands ongoing effort to deliver value to all stakeholders and address any concerns.



Figure 2 - AgriDataSpace Key stakeholder categories

### 3.3. Sustainability Checkpoints

The roadmap for CEADS needs a series of carefully defined sustainability checkpoints aimed at fostering a robust, inclusive and forward-looking agricultural data ecosystem. These checkpoints are central to guiding the development and operational phases of CEADS towards long-term sustainability, adaptability and sector-wide impact. The table below outlines each checkpoint in detail, providing insights into their descriptions, implementation timelines, and the means and strategies by which they can be achieved. Through a mix of stakeholder engagement, innovation, feedback integration and policy alignment, the roadmap sets out a comprehensive framework to ensure the success and sustainability of CEADS. This approach not only underlines the initiative's commitment to addressing the current and future needs of the agricultural sector, but also lays the foundation for a collaborative, data-driven future for European agriculture.

**Table 7 - Sustainability Checkpoints**

Checkpoint	Description	Means of Achievement	Strategies for Achievement	Implementation Start/Expected Timeline
<b>High Levels of Stakeholder Engagement</b>	Secure and maintain active participation from diverse stakeholder.	Workshops, Surveys, Advisory Boards	Tailored engagement plans, recognition programs, stakeholder-specific communication	Deployment Phase/Continuous
<b>Continuous Cycles of Innovation</b>	Promote new technologies and practices within CEADS.	Innovation Hubs, Hackathons	Collaborations with tech startups and research institutions, innovation challenges	Operational Phase/Continuous
<b>Robust Feedback Mechanisms</b>	Collect and integrate stakeholder feedback systematically.	Digital Platforms, Regular Forums	User-friendly feedback tools, integration of feedback into development cycles	Operational Phase/Continuous
<b>Data Quality Standards Adoption</b>	Ensure data reliability and usability through high-quality standards.	Standard Development Committees	Developing consensus-based standards, regular reviews and updates	Deployment Phase/Within 1 year
<b>Interoperability with Other Data Spaces</b>	Enable seamless data exchange with global data spaces.	Technical Working Groups, APIs	Adoption of international data standards, API development and management	Operational Phase/2-3 years

<b>Environmental Impact Assessment</b>	Minimise CEADS's environmental footprint.	Environmental Audits, Sustainability Reporting	Implementing green practices, optimising storage and processing IT data and	Operational Phase/Annually
<b>Economic Viability Analysis</b>	Assess economic impact and contributions of CEADS.	Economic Studies, Impact Assessments	Collaborations with economic research institutions, sector-specific impact analysis	Operational Phase/Every 2 years
<b>Stakeholder Satisfaction Surveys</b>	Guide improvements based on feedback.	Surveys, Feedback Sessions	Regular satisfaction assessments, action plans based on feedback	Operational Phase/Bi-annually
<b>Expansion of Data Categories</b>	Adapt to evolving sector needs by integrating new data categories.	Data Curation Teams, Sector Analysis	Continuous sector trend monitoring, stakeholder consultations on data needs	Operational Phase/Ongoing
<b>Community-Building Initiatives</b>	Foster collaborative CEADS community.	Workshops, Online Platforms	Creation of collaborative spaces, community recognition programs	Operational Phase/Ongoing
<b>Skills and Training Programs</b>	Enhance skills in data management and application.	Training Modules, Webinars	Development of comprehensive training programs, partnerships with educational institutions	Operational Phase/Ongoing
<b>Adoption Metrics and Benchmarks</b>	Set benchmarks for engagement and growth.	Performance Dashboards, Data Analytics	Regular monitoring of key performance indicators, benchmarking against sector averages	Operational Phase/Annually
<b>Policy Alignment and Advocacy</b>	Support digital agriculture policies aligned with CEADS.	Policy Workshops, Advocacy Campaigns	Engagement with policymakers, development of policy recommendation papers	Both Phases/Ongoing

## 4. Key Elements for Success

This chapter provides an analytical overview of the basic strategies and frameworks necessary for the sustainable development of CEADS. It outlines the stakeholder engagement process, including classification and strategic interaction, and presents a trade-off analysis to guide the project's strategic choices. It discusses the importance of collaboration, presents tools to enhance stakeholder dialogue, and details a monitoring and evaluation framework to assess the impact of the project. Using a focused approach, Chapter 5 addresses the critical components for building and sustaining a collaborative, data-driven agricultural ecosystem, underscoring the project's commitment to innovation, inclusivity and adaptability.

### 4.1. Stakeholder classification

The analysis of the stakeholders (data consumers and providers) of the 64 DSIs identified in the WP1 survey led to their clustering, which formed the basis of the value chain network. Stakeholders were further categorised as ecosystem actors (customer, partner, supplier, operator) based on their roles, interests and relationship to the Common European Agricultural Data Space value streams (data, money, services). This detailed analysis (Deliverable 2.1) is crucial for building robust data space initiatives; clustering stakeholders clarifies the value network, revealing relationships, synergies and dependencies, ultimately fostering collaboration and driving data-driven agricultural innovation.

The DSI mapping work, together with the experience of partners and internal research, has led to the classification of the digital agricultural sector into the following categories:

**Table 8 - Stakeholder groups and actors**

Actors of Value Creation Network	Stakeholders Categorization
<b>Customer</b>	Farmers and Agricultural Producers
	Data Intermediaries and Service Providers
	Government and Regulatory Bodies
	Research and Academic Institutions
<b>Partners</b>	Farmers and Agricultural Producers
	Technology and Data Providers
	Data Intermediaries and Service Providers
	Government and Regulatory Bodies
	Research and Academic Institutions
	Business and Industry Stakeholders
<b>Suppliers</b>	Multi-actor Collaborations
	Farmers and Agricultural Producers
	Technology and Data Providers
	Government and Regulatory Bodies

	Research and Academic Institutions
	Multi-actor Collaborations
<b>Operator(s)</b>	Farmers and Agricultural Producers
	Technology and Data Providers
	Data Intermediaries and Service Providers
	Financial and Insurance Services
	Research and Academic Institutions
	Business and Industry Stakeholders
	Multi-actor Collaborations

## 4.2. Trade-Off Analysis

This chapter critically examines the strategic considerations required for CEADS, highlighting the importance of trade-off analyses. These analyses are critical for navigating the inherent trade-offs between governance flexibility and stability, aligning diverse stakeholder interests, and managing the operational intricacies of a sustainable, inclusive agricultural data ecosystem. This chapter provides a roadmap for balancing competing priorities and ensuring that strategic decisions drive the project towards its long-term goals, stakeholder engagement and technological adaptability.

**Table 9 - Trade-off analysis and expansion guidelines**

Aspect	Trade-off	Proposed Solution	Strategic Actions for Network Expansion
Institutional	Governance Scheme Flexibility VS Stability	Validate that the proposed governance model incorporates both static elements for stability and dynamic elements for flexibility, such as a core governance body with rotating advisory panels.	<ul style="list-style-type: none"> <li>Engage in continuous dialogue with stakeholders for governance feedback.</li> <li>Establish a review mechanism for governance practices.</li> </ul>
	Inclusivity VS Manageability	Implement tiered participation or rotating representation in governance to manage broad stakeholder inclusivity efficiently.	<ul style="list-style-type: none"> <li>Develop clear criteria for representation and rotation.</li> <li>Foster smaller, focus groups for specific issues or sectors.</li> </ul>
Operational	Interoperability VS Sector-Specific Needs	Create a modular interoperability framework that meets core standards with the flexibility to incorporate sector-specific modules.	<ul style="list-style-type: none"> <li>Encourage the development of sector-specific interoperability modules.</li> <li>Regularly update interoperability standards based on stakeholder feedback.</li> </ul>

	Centralization VS Decentralisation	Adopt a hybrid operational model with centralised governance for standards and decentralised operations for data management.	<ul style="list-style-type: none"> <li>Identify and empower regional or sectoral hubs.</li> <li>Develop protocols for central oversight and local autonomy.</li> </ul>
Financial	Funding Model Diversity VS Simplicity	Develop a primary, simple funding structure complemented by secondary diversified revenue streams.	<ul style="list-style-type: none"> <li>Create a clear, transparent explanation of the funding model.</li> <li>Explore innovative funding streams with pilot projects.</li> </ul>
	Short-term Funding VS Long-term Sustainability	Balance immediate operational funding needs with investments in developing long-term revenue-generating services.	<ul style="list-style-type: none"> <li>Implement a phased financial strategy.</li> <li>Develop and market value-added services with potential for revenue generation.</li> </ul>
<b>Expansion Guidelines</b>			
<b>Enhance Stakeholder Engagement</b>		Deepen engagement through targeted outreach and use case-driven value propositions.	<ul style="list-style-type: none"> <li>Organise stakeholder workshops.</li> <li>Develop communication strategies tailored to different stakeholder groups.</li> </ul>
<b>Iterative Development and Feedback Loops</b>		Utilise an iterative development process with regular stakeholder feedback to refine the project continuously.	<ul style="list-style-type: none"> <li>Establish regular feedback mechanisms.</li> <li>Adapt development processes based on feedback.</li> </ul>
<b>Partnerships and Collaborations</b>		Seek and formalise partnerships with other data spaces, technology providers, and research institutions.	<ul style="list-style-type: none"> <li>Identify potential partners for collaboration.</li> <li>Formalise partnership agreements and joint projects.</li> </ul>
<b>Open Standards and Interoperability</b>		Promote the development and adoption of open standards and interoperability frameworks.	<ul style="list-style-type: none"> <li>Lead or participate in initiatives for developing open standards.</li> <li>Advocate for interoperability in broader agricultural and data space communities.</li> </ul>

More specific approaches on the expansion guidelines of the table above, are offered in the following chapters.

### 4.3. Stakeholder engagement and expansion

Based on the analysis of numerous DSIs, the AgriDataSpace project aimed to improve its stakeholder engagement strategies. Recognising the importance of a strong value network, the project prioritised digital platforms to broaden engagement and establish robust feedback channels. This ensured it met the diverse needs of the agricultural data ecosystem and fostered greater collaboration.

The AgriDataSpace project used advanced digital platforms for interactive stakeholder experiences such as virtual roundtables and webinars. It implemented feedback mechanisms such as surveys and Q&A sessions to actively gather input. In addition, to promote inclusivity, the project focused on multilingual resources and targeted outreach to under-represented groups within the agricultural sector, ensuring that messages were relevant to their specific context.

#### Dissemination and Communication: Successes and Areas for Improvement

The AgriDataSpace project implemented a comprehensive dissemination and communication strategy, successfully achieving visibility and engaging a wide range of stakeholders. Its strong visual identity and use of digital platforms played a crucial role in effectively communicating the project's objectives and results. Participation in industry events and content marketing tools such as flyers and banners significantly increased awareness. These efforts resulted in broad visibility within the target audience, supported by tailored communications to specific stakeholder groups. However, there's room for improvement. The project could benefit from more structured evaluation methods to assess the effectiveness of dissemination activities through KPIs. In addition, the implementation of robust feedback mechanisms and a focus on language localisation and digital accessibility would enhance inclusivity and further extend the reach of the project's communication efforts.

#### Limits to Stakeholder Involvement and Strategies for Improvement

The AgriDataSpace framework faces challenges in achieving consensus due to **time constraints**, the **complexity of the data space concept**, **language barriers** and the **geographical dispersion** of stakeholders. These factors may limit the project's ability to fully incorporate input from different stakeholders.

To overcome these limitations, AgriDataSpace should prioritise **flexible engagement methods** such as asynchronous communication and recorded resources. Providing clear educational materials tailored to different stakeholder backgrounds will demystify the data space concept. In addition, **multilingual support** and **regional workshops** or virtual meetings will address language barriers and geographical challenges. By implementing these strategies, the AgriDataSpace project can foster a more inclusive and collaborative approach, which is crucial for the successful development of the Common European Agricultural Data Space.

### 4.4. Collaborations

The progress and impact of the CEADS will be significantly influenced by strategic collaborations. The table below provides a brief overview of potential future partnerships, highlighting their benefits and providing examples of how these collaborations could develop. These partnerships are essential for technological innovation, sustainability efforts and educational advances, positioning CEADS at the forefront of agricultural development in line with the EU's vision for a sustainable and technologically advanced agricultural sector.

#### Table 10 - CEADS future collaborations

Collaboration Partner	Potential Benefits	Specific Examples
<b>Advanced Technology and Research Centers</b> <b>AI</b>	<ul style="list-style-type: none"> <li>Integration of cutting-edge technologies for better data processing.</li> <li>Improved decision-making and development of smart agricultural practices.</li> </ul>	<ul style="list-style-type: none"> <li>Collaborations with leading technological universities and research institutes specialising in AI and machine learning to explore data analytics solutions for predictive agriculture.</li> </ul>
<b>Open Data Initiatives and International Data Spaces</b>	<ul style="list-style-type: none"> <li>Enhanced data interoperability and sharing across borders.</li> <li>Establishment of international standards for agricultural data.</li> </ul>	<ul style="list-style-type: none"> <li>Engage with global initiatives focused on agricultural data sharing to promote open data principles.</li> <li>Integration efforts with existing agricultural data spaces to ensure interoperability and standard adoption.</li> </ul>
<b>Sustainability and Environmental Organizations</b>	<ul style="list-style-type: none"> <li>Guidance on integrating sustainability metrics and environmental impact assessments.</li> <li>Alignment of agricultural practices with environmental protection goals.</li> </ul>	<ul style="list-style-type: none"> <li>Partnerships with international environmental NGOs to develop sustainability assessment tools for agriculture.</li> <li>Collaboration with sustainability-focused think tanks to integrate eco-friendly farming practices.</li> </ul>
<b>Farmer Cooperatives and Agricultural Producer Associations</b>	<ul style="list-style-type: none"> <li>Ensures the data space meets the practical needs of farmers.</li> <li>Empowers farmers with data-driven insights for optimising operations.</li> </ul>	<ul style="list-style-type: none"> <li>Engaging with national and regional farmer cooperatives to tailor CEADS solutions to farmer needs.</li> <li>Collaborative pilot projects with agricultural producer groups to test data-driven decision-making tools.</li> </ul>
<b>Agritech Startups and Innovation Hubs</b>	<ul style="list-style-type: none"> <li>Integration of new technologies and solutions from startups.</li> <li>Development of novel services and tools for the agricultural sector.</li> </ul>	<ul style="list-style-type: none"> <li>Collaboration with Agritech incubators and accelerators to scout for innovative startups.</li> <li>Joint development projects with startups focused on sustainable agriculture technologies.</li> </ul>
<b>Educational Institutions and MOOC Platforms</b>	<ul style="list-style-type: none"> <li>Development of educational programs to improve digital literacy.</li> <li>Facilitation of widespread adoption of data-driven agricultural practices.</li> </ul>	<ul style="list-style-type: none"> <li>Development of specialised courses in partnership with agricultural colleges and online education platforms.</li> <li>Initiatives with educational institutions to enhance digital skills among farmers.</li> </ul>



<b>Government Agencies and Policy Makers</b>	<ul style="list-style-type: none"> <li>Ensures alignment of CEADS with regulatory requirements.</li> <li>Facilitates the development of favourable policies for digital agriculture.</li> </ul>	<ul style="list-style-type: none"> <li>Consultations with national and EU regulatory bodies to ensure policy compliance.</li> <li>Collaboration on digital agriculture policy development and implementation strategies.</li> </ul>
<b>Financial Institutions and Insurance Companies</b>	<ul style="list-style-type: none"> <li>Development of data-driven financial products and services.</li> <li>Reduction of financial risks for farmers through precision insurance models.</li> </ul>	<ul style="list-style-type: none"> <li>Partnership initiatives with financial services companies to create innovative financing models based on agricultural data.</li> <li>Collaborative efforts with insurance companies to develop precision farming insurance.</li> </ul>
<b>Non-Profit Organisations Focused on Global Food Security</b>	<ul style="list-style-type: none"> <li>Collaborative development of solutions for global food security challenges.</li> <li>Enhancement of food production efficiency and distribution.</li> </ul>	<ul style="list-style-type: none"> <li>Joint projects with international food security organisations to leverage agricultural data in combating hunger.</li> <li>Data-sharing initiatives with NGOs working on sustainable food systems.</li> </ul>
<b>Standards Organizations</b>	<ul style="list-style-type: none"> <li>Establishment and adoption of standards for data quality, interoperability, and security.</li> <li>Ensures compatibility and trust across the agricultural data ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>Participation in standard-setting bodies related to agricultural data to contribute to and adopt international standards.</li> <li>Efforts to harmonise data standards across the agricultural sector with industry groups.</li> </ul>

### 4.5. Tools for furthering stakeholder dialogue

To drive the CEADS forward, effective stakeholder engagement is essential. This chapter presents strategies to enhance stakeholder dialogues, emphasising digital and traditional platforms for broad and inclusive participation. Key initiatives include diverse dialogue facilitation, feedback integration, inclusivity, and policy influence, supported by actionable steps and specific tools. This streamlined approach aims to bolster stakeholder interaction, fostering a CEADS ecosystem that is collaborative, innovative, and responsive to the needs of European agriculture.

**Table 11 - Tools for furthering stakeholder dialogue**

Enhancement Area	Supportive Actions	Tools/Platforms	Potential Metrics
<b>Dialogue Facilitation Mechanisms</b>	Develop and implement a suite of digital and physical platforms for varied interaction types.	Online forums, webinars, digital town halls, collaborative workspaces	Number of dialogues held, participant numbers
<b>Case Studies and Use Cases</b>	Document and share success stories and lessons learned from stakeholder dialogues.	Dedicated section on the CEADS website, newsletters, and annual reports	Case studies published, impact stories shared

<b>Stakeholder Dialogue Roadmap</b>	Establish a clear schedule of topics and events for stakeholder dialogues, aligning with agricultural trends.	Interactive roadmap on CEADS portal, annual stakeholder engagement calendar	Number of scheduled vs. completed dialogues, thematic coverage
<b>Feedback Integration Workflows</b>	Create structured processes for collecting, analysing, and acting on feedback from dialogues.	Feedback forms, integration dashboards in project management tools	Feedback items implemented, time to integration
<b>Inclusive Dialogue Strategies</b>	Develop targeted strategies to engage underrepresented groups in dialogues.	Outreach programs, targeted invitations, inclusive communication materials	Diversity of dialogue participants, engagement rates of targeted groups
<b>Policy Dialogue Facilitation</b>	Plan and facilitate discussions aimed at influencing agricultural policy and regulations.	Policy workshops, roundtable discussions with policymakers	Number of policy dialogues, policy recommendations submitted
<b>Stakeholder Dialogue Success Metrics</b>	Define and track metrics to assess the success and impact of stakeholder dialogues.	Surveys, analytics tools for digital platforms	Diversity of participants, actionable outcomes, satisfaction rates

## 4.6. Monitoring and evaluation framework

Any of the suggested approaches towards incentivizing stakeholder engagement in the development of the CEADS and expanding the existing stakeholders would benefit from the establishment of a Monitoring and Evaluation (M&E), a framework that is central to the development of CEADS. This framework is carefully designed to maximise the impact of stakeholder engagement by assessing the effectiveness of strategies, measuring their contribution to project outcomes and incorporating mechanisms for continuous improvement. The M&E framework has been designed with specific objectives in mind: to assess the effectiveness of engagement strategies, to measure the extent of stakeholder contribution to project objectives, to integrate stakeholder feedback to refine engagement approaches, and to ensure alignment of these efforts with CEADS' broader objectives of innovation, sustainability and inclusiveness.

**Table 12 - Monitoring and evaluation KPIs**

KPI Name	Description	Measurement Method	Target
Stakeholder Participation Rates	Number and diversity of stakeholders actively involved in project activities.	Surveys, registration data, participation logs	Increase participation by 20% annually
Feedback Collection and Utilisation	Volume of feedback received and the extent to which it is integrated into project development.	Feedback forms, online platforms, integration reports	100% of actionable feedback integrated within 3 months

Satisfaction and Value Perception	Stakeholder satisfaction levels and perceived value of CEADS.	Satisfaction surveys, interviews	Achieve an average satisfaction score of 4 out of 5
Collaboration and Synergy Creation	Quantity and quality of collaborations and synergies formed through engagement efforts.	Partnership agreements, project reports	Form at least 5 new strategic partnerships annually

A range of methods will be used to collect data relevant to the above KPIs. Surveys and questionnaires will be distributed periodically to gather both quantitative and qualitative feedback. Interviews and focus groups will provide in-depth insights from key stakeholders. Digital tools will be used to track engagement metrics across platforms, and case studies will document successful examples of stakeholder engagement.

The evaluation process is structured to begin with a baseline assessment to establish initial metrics. It will include ongoing tracking of engagement activities and stakeholder feedback, comprehensive evaluations at key project milestones, and collation of lessons learned for continuous improvement.

To implement the M&E framework, the following steps are taken:

1. **Define responsibilities:** Assign clear roles for M&E activities within the project team.
2. **Develop an M&E plan:** Outline detailed objectives, KPIs, data collection methods and evaluation processes.
3. **Use technology:** Use digital tools for efficient data collection, analysis and reporting.
4. **Cultivate a learning culture:** Encourage adaptation and refinement based on M&E findings.

## 5. Lessons learned and next steps

As the AgriDataSpace project progressed towards the creation of the CEADS, the process highlighted several key insights that are essential to building a digital agricultural ecosystem. Central to these insights is the establishment of an ecosystem of engagement, which has proven to be critical to the project's progress. An inclusive, stakeholder-driven approach underscored the value of diverse input, enriching the fabric of CEADS and ensuring that it addresses the diverse needs of the sector.

The experience reinforced the need for adaptive governance and business models, capable of evolving with the dynamic landscapes of agriculture and digital technology. Trust and transparency emerged as fundamental pillars, fostering an environment conducive to collaboration and stakeholder participation. In addition, the effort highlighted the essential nature of multi-stakeholder collaboration, bringing together diverse sectors to contribute to a comprehensive agricultural data space. Continuous learning and adaptation were identified as a necessity, guiding the iterative refinement of strategies and solutions in response to feedback and emerging challenges.

A key milestone in the project timeline, the **final event scheduled for 25 April 2024** at the Copa-Cogeca headquarters in Brussels, represents not only a culmination, but also a pivotal moment for reflection and future planning. This gathering of project partners and key stakeholders aims to discuss the achievements of the AgriDataSpace project, including the governance framework and sustainable business models developed for CEADS. By aligning with the European Green Deal and exploring the prospects for data-driven agriculture in Europe, the event will lay the groundwork for continued collaboration and innovation in the sector.

In parallel with the development of the project, **a new newsletter initiative has been launched to maintain the momentum around CEADS**. By giving the option to subscribers to be provided with updates on future developments, this initiative ensures continued stakeholder engagement and keeps the dialogue around CEADS vibrant and forward-looking.

As we move into the next phases of CEADS, the project is committed to expanding stakeholder engagement, refining governance and business models, and enhancing the technology infrastructure. The aim is to support the evolving needs of CEADS while fostering innovation and collaboration within its ecosystem. The implementation of a monitoring and evaluation framework will be key to tracking progress, adjusting strategies and ensuring the long-term sustainability and impact of CEADS.

The lessons learned from the AgriDataSpace project highlight the transformative potential of collaborative, data-driven innovation in agriculture. Going forward, these lessons will guide efforts to consolidate CEADS' foundation, drive sustainable growth, and ensure its continued relevance in the digital transformation of European agriculture.