



**AI4Agri**

**Developing green and digital skills towards AI use in agriculture**

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**National Policy Report**

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- 25.08.2025 – Online
- Profiles included: agricultural experts, educators, advocates, existing/potential entrepreneurs interested on the topic

### Executive Summary

The Swedish Roundtable was conducted in an online format, as this modality provided the most practical means of convening within the limited timeframe of the summer period while accommodating the diverse schedules of stakeholders. In total, more than thirty stakeholders were contacted and invited to contribute, of whom fourteen ultimately participated in the discussion.

The choice of an online format carried methodological significance. On the one hand, it facilitated the inclusion of geographically dispersed participants, minimized travel requirements, and allowed for greater flexibility in scheduling. On the other hand, the digital setting may have influenced the dynamics of interaction, potentially limiting opportunities for informal exchange and in-depth deliberation compared to in-person settings. Nevertheless, the online approach was assessed as the most effective strategy to ensure timely and diverse stakeholder engagement under the given circumstances, and it enabled a wide range of perspectives to be represented in the dialogue. Although no representatives from local government were present, the discussion was enriched by insights from agriculture experts, educators, existing and potential entrepreneurs interested on the topic, and advocates.

Throughout the Policy Roundtable, participants emphasized that AI should not be regarded as an abstract or distant concept, but rather as a practical enabler when applied in concrete contexts. One participant described it as a lever capable of translating environmental objectives into economically viable farming practices. At the same time, an educator cautioned that when AI is presented solely as futuristic technology, it risks being perceived as a theoretical notion rather than a tool that farmers can trust and apply. This tension between abstract discussion and practical implementation was identified as a central challenge. Both farmers and educators stressed that understanding and acceptance of AI increase substantially when it is demonstrated through clear, relatable use cases—underscoring the importance of grounding innovation in tangible, locally relevant examples.

Building on these discussions, a set of policy recommendations was formulated around five pillars: infrastructure investment, financial support mechanisms, capacity building and training, open data and interoperability, and ethical and regulatory clarity. Collectively, these recommendations aim to ensure that Sweden's agricultural sector evolves in a way that is technologically advanced, environmentally sustainable, and socially equitable.

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## 1. INTRODUCTION AND GENERAL PERCEPTIONS

At the roundtable, participants noted that while Sweden has long been recognized for its strong environmental regulation, the country is also increasingly active in creating policy tools that enable digital experimentation. Some stakeholders initially argued that existing subsidy structures and CAP instruments are not well aligned with AI adoption in agriculture, which can make it difficult for farmers and innovators to identify clear support pathways. However, others pointed out that this does not mean Sweden lacks mechanisms for digital innovation altogether.

Sweden has, in fact, developed a policy toolkit that combines environmental regulation with digital openness. The Swedish Environmental Code remains the backbone of compliance and sustainability in farming, continuing to guide machinery standards, pollution control, and resource use. But alongside this, Sweden is actively expanding tools for digital experimentation. For example, the Swedish Data Protection Authority (IMY) runs regulatory sandboxes that allow companies to test AI applications, digital health solutions, and other data-intensive innovations under real-world conditions while ensuring compliance with GDPR and privacy safeguards.

From an institutional perspective, Sweden is also investing in a data-driven public sector, where data is treated as an asset for innovation and collaboration. An OECD review underscored Sweden's progress toward digital openness, user engagement, and improved data governance frameworks, emphasizing that digital government is becoming a cornerstone of policy-making.

The roundtable discussion reflected this dual reality: while farmers and entrepreneurs experience gaps in direct agricultural funding streams for AI, Sweden's broader policy environment shows a clear commitment to digital experimentation and openness. The challenge lies less in the absence of digital policy tools, and more in ensuring that these tools are translated and made accessible to the agricultural domain, so that smaller farms in particular can benefit from regulatory flexibility, innovation support, and the opportunities provided by open data frameworks.

## 2. KEY BARRIERS TO AI ACCESSIBILITY

Roundtable participants emphasized that the integration of AI into agriculture brings with it a set of critical challenges that hinder accessibility. Foremost among these are the high upfront costs of AI technologies and the absence of clear and inclusive financing mechanisms, which disproportionately affect small and medium-sized farms. This unequal distribution of risks and benefits highlights the need for inclusive and equitable innovation processes to ensure that vulnerable farming communities are not left behind.

Skills and knowledge gaps remain a major obstacle, as many farmers are uncertain about how to effectively integrate AI into their daily operations. Simultaneously, the growing digitalization of the food system raises concerns over data ownership, privacy, and security, with farmers expressing unease that farm-level data could be captured and monetized by large agritech corporations without adequate benefit-sharing.

Beyond these practical and structural issues, participants also pointed to the ethical implications of delegating decision-making to intelligent systems, noting that mistrust arises when AI predictions contradict long-standing farming practices. Such concerns underline the importance of careful governance frameworks to balance innovation with transparency, accountability, and farmer trust.

## 3. INFRASTRUCTURE AND FINANCIAL NEEDS

High upfront investment costs, coupled with uncertain returns, make many farmers, particularly smallholders, hesitant to commit to new technologies. Larger farms, with more capacity to absorb risk, are often positioned as early adopters, whereas small-scale farmers typically fall into the late majority or laggard categories. Without tailored financial mechanisms, this divide risks widening existing inequalities in the sector.

Beyond cost, technical complexity and limited digital skills create significant usage barriers. Agricultural experts expressed concerns that AI systems are difficult to operate without specialized knowledge, and without accessible support structures, adoption remains limited.

A further layer of resistance stems from psychological and cultural barriers, particularly among older farmers who prefer traditional practices and are cautious about relying on machine-led decision-making. This highlights the need for education and demonstration projects that can bridge the gap between familiarity and innovation.

Looking ahead, emerging trends such as declining costs in precision farming equipment and rapid advances in automation and AI offer considerable opportunities. However, these benefits will only be fully realized if made accessible to smallholders through multifaceted interventions—including targeted financial support schemes, improved rural infrastructure, and inclusive training programs. Such measures are essential to ensure that Sweden’s agricultural sector evolves in a way that is both technologically advanced and socially equitable.

#### 4. EDUCATION

Training was consistently highlighted as a decisive factor for AI adoption, but the current distribution of educational opportunities remains uneven and risks undermining Sweden’s commitments to equity, inclusion, and non-discrimination. While many resources exist within higher education and research environments, these pathways primarily benefit students and professionals who already have access to advanced training. In contrast, practicing farmers, migrants, seasonal workers, and other socially disadvantaged groups often lack opportunities to develop the skills required to engage meaningfully with AI. This dynamic risks creating a two-tiered system in which digital innovation advances for the well-resourced, while vulnerable groups are left further behind.

Participants emphasized that while EU-level initiatives such as the WP3 modules provide a useful framework, their effectiveness hinges on adaptation to diverse learning needs. Younger, digitally literate farmers may benefit from online training, but older farmers, migrants with limited Swedish language skills, and those with low digital literacy require hands-on, practical learning opportunities delivered in accessible formats and multiple languages. In this regard, Sweden’s folk high schools (folkhögskolor), municipal adult education (Komvux), and study associations (studieförbund) were highlighted as critical actors capable of delivering community-based, inclusive, and culturally sensitive training. Approaches such as peer-to-peer learning, demonstration farms, and participatory workshops were also seen as effective in overcoming psychological barriers and building trust across farming communities.

Training must also extend beyond technical skills. Vulnerable populations in particular need opportunities to understand data governance, digital rights, and the ethical implications of algorithmic decision-making in agriculture. Without such knowledge, these groups risk becoming passive technology users, subject to external decisions and power imbalances, rather than active rights-holders in Sweden’s agricultural digital transition.

Ultimately, the challenge is not the lack of training resources, but rather their misalignment with the groups most at risk of exclusion. Current investments often prioritize formal education and advanced research, while the everyday realities of smallholders, migrant workers, and digitally marginalized populations are overlooked. A shift toward inclusive, lifelong learning pathways, rooted in Sweden’s strong tradition of adult and popular

education, is essential to ensure that AI adoption strengthens equity, resilience, and social cohesion across the agricultural sector.

## 5. MONITORING AND EVALUATION

Participants underlined the importance of establishing clear and measurable indicators to evaluate the success of AI applications in agriculture. It was widely agreed that such indicators should not only demonstrate productivity gains but also reflect sustainability outcomes and social impact.

More precisely, participants emphasized that increases in yields and reductions in the use of inputs such as water, fertilizer, and pesticides should be regarded as the most important measures of success. These were seen as central both to improving agricultural productivity and to promoting greater resource efficiency. Many participants also highlighted the importance of training and adoption rates, noting that the ability of farmers to effectively integrate AI tools into their daily practices is just as critical as the performance of the technology itself.

When discussing practical engagement, most participants expressed readiness to take part in pilot programs or case studies to test AI applications in agriculture. Others indicated they might be open to involvement if given additional information or appropriate incentives, pointing to the importance of building trust and demonstrating tangible value.

Overall, the discussions underscored that monitoring and evaluation frameworks for AI in agriculture must balance productivity, resource efficiency, and environmental sustainability, while also capturing training, adoption, and community participation as essential dimensions for long-term impact.

## 6. MULTI-STAKEHOLDER ENGAGEMENT

While the majority of participants were agricultural experts, existing/potential entrepreneurs, educators and technology experts, the roundtable brought together a diverse group in terms of educational background, and professional experience. This diversity of representation enriched the discussion, as insights were shared from multiple angles of the agricultural sector.

The presence of stakeholders with different professional roles and responsibilities ensured that the debate on the use of AI in agriculture was multi-dimensional. The inclusion of participants with varied educational and technological familiarity also highlighted contrasting needs, particularly around training and the accessibility of AI solutions. As a result, conversations on key issues, such as barriers to adoption, gaps in training, and professional support needs, were approached from a range of viewpoints.

## 7. POLICY RECOMMENDATIONS

### 7.1 INFRASTRUCTURE INVESTMENT

- Encourage the development of digital collaboration platforms where farmers, cooperatives, and agri-tech companies can share knowledge, best practices, and demonstrations of AI use in Swedish farming contexts.
- Invest in energy-efficient infrastructure, ensuring that AI tools and platforms can be powered by renewable energy sources, in line with Sweden's sustainability commitments.

### 7.2 FINANCIAL SUPPORT MECHANISMS

- Enhance public-private digital hubs across regions, where farmers can access AI services and tools at affordable rates, lowering barriers for smaller producers.
- Introduce government-backed grant programs to co-finance AI adoption, including costs for hardware, software, and farmer training, with special focus on small and medium-sized farms.

### 7.3 CAPACITY BUILDING AND TRAINING

- Organize nationally funded workshops and online courses designed to teach farmers and agricultural professionals the basics of AI in simple, practical ways, ensuring accessibility for all age groups.
- Foster peer-to-peer learning networks, where early adopters and technologically advanced farmers can mentor others, especially in cooperative settings.

### 7.4 OPEN DATA AND INTEROPERABILITY

- Establish standards for interoperability so that AI tools and platforms can work seamlessly across different farm management systems, reducing costs and complexity.
- Encourage transparent data-sharing partnerships between government, research institutions, and private companies, ensuring that data serves the public good while protecting individual rights.

### 7.5 ETHICAL AND REGULATORY CLARITY

- Define and enforce rules on data ownership and consent, ensuring that farmers retain ownership of their data and control how it is shared and used.
- Establish clear data governance frameworks and strengthen regulatory bodies tasked with monitoring compliance, with a focus on safeguarding farmers and consumers.



- Develop ethical guidelines for AI use in agriculture, addressing issues such as fairness, transparency, environmental impact, and labor implications.

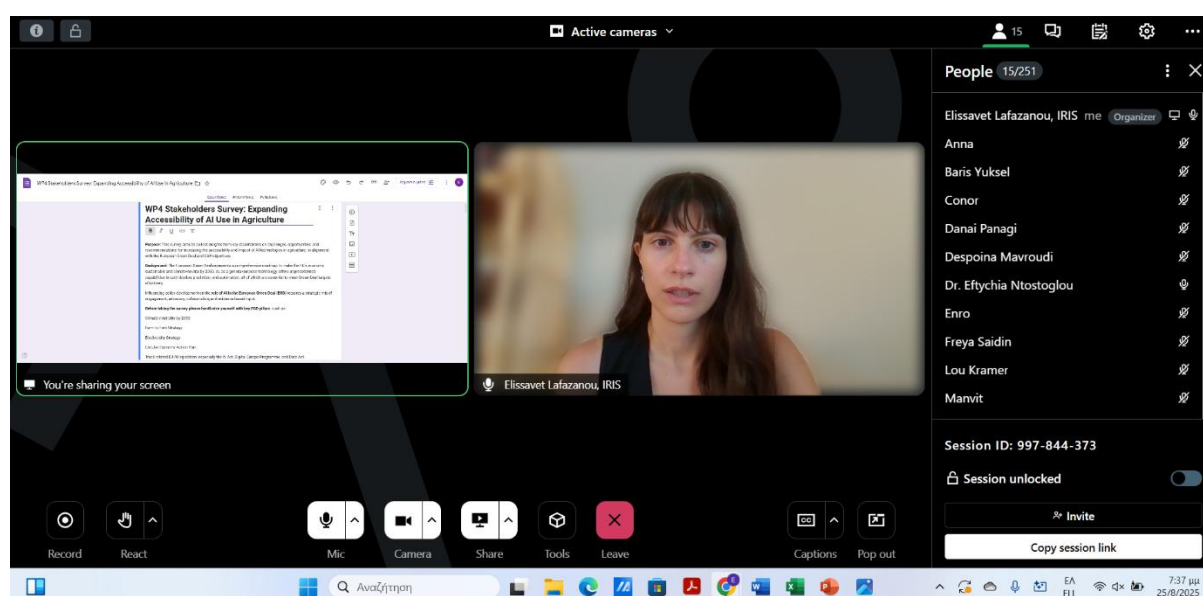
## 8. CONCLUSION

The Swedish Roundtable demonstrated that while AI holds considerable promise for agriculture, its benefits will only be realized through inclusive and well-aligned policy frameworks. Sweden's strength lies in its dual approach: a long-standing commitment to environmental sustainability and a growing openness to digital experimentation. Yet, the agricultural sector requires clearer pathways that translate this digital policy infrastructure into practical, farm-level support.

Addressing financial barriers, ensuring equitable access to training, and creating trust-based governance frameworks will be decisive for adoption, particularly among small and medium-sized farms. Equally important is the need to embed AI innovation within Sweden's tradition of inclusive education and cooperative structures, ensuring that technological advances do not exacerbate inequalities but instead foster resilience and social cohesion.

Ultimately, Sweden is well positioned to become a European leader in sustainable digital agriculture. By grounding AI applications in tangible, locally relevant use cases, strengthening multi-stakeholder engagement, and aligning innovation with the values of transparency, equity, and environmental stewardship, Sweden can ensure that the digital transition in agriculture contributes to a more resilient and sustainable food system.

## 9. ATTACHMENTS







AI4Agri Project website: <https://www.ai-4-agri.eu/>

AI4Agri Project e-Learning Platform: <https://ai4agri-elearning.eu/>

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