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AI4AGRI

AI4Agri

Developing green and digital skills towards AI use in agriculture

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Erasmus+

KA220-VET - Cooperation partnerships in vocational education and training

WP2:

WP2: Connecting AI with Agricultural sector:

current status and needs assessment

A.2.2.: Needs Assessment Survey National Report Sweden

Developed by

IRIS Sustainable Development

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Executive Summary

This report primarily presents the findings of the needs assessment survey conducted with agricultural workers, existing and potential entrepreneurs in Sweden. The survey aimed to identify current status, perceptions of staff and gaps in the use of AI applications and tools as well as explore potential ways to engage the agricultural workforce in utilizing these technologies. Additionally, the report includes a brief introduction and a section dedicated to conclusions and recommendations.

Introduction

The AI4Agri project stands as a vital initiative within the European Union's agricultural sector, acknowledging the critical role agriculture plays in climate change mitigation efforts. By emphasizing environmental sustainability and digital transformation, AI4Agri not only raises awareness of the transformative potential of AI in agriculture but also aims to develop the essential skills and capacities needed for its widespread adoption.

The project will employ a targeted vocational education and training program to equip agricultural workers and entrepreneurs with the latest knowledge and competencies. This approach ensures that the workforce can adapt to emerging trends, driving progress towards the Sustainable Development Goals and aligning with the EU's environmental objectives.

This report aims to provide comprehensive data and insights into the current state and perspectives of agricultural workers and both existing and potential entrepreneurs in Sweden. It seeks to identify gaps in the use of AI applications and tools within the agricultural sector and explore strategies to engage the workforce in leveraging these technologies effectively. By doing so, the report contributes to the broader goals of workforce adaptation, sustainable agricultural practices, and the advancement of digital innovation in agriculture.

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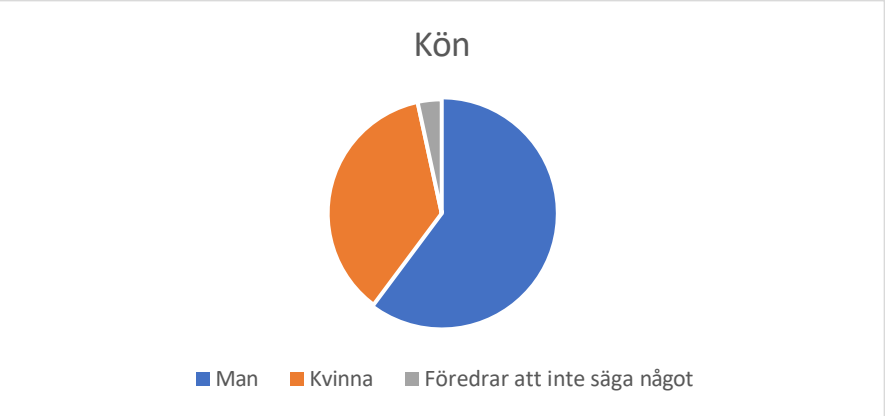
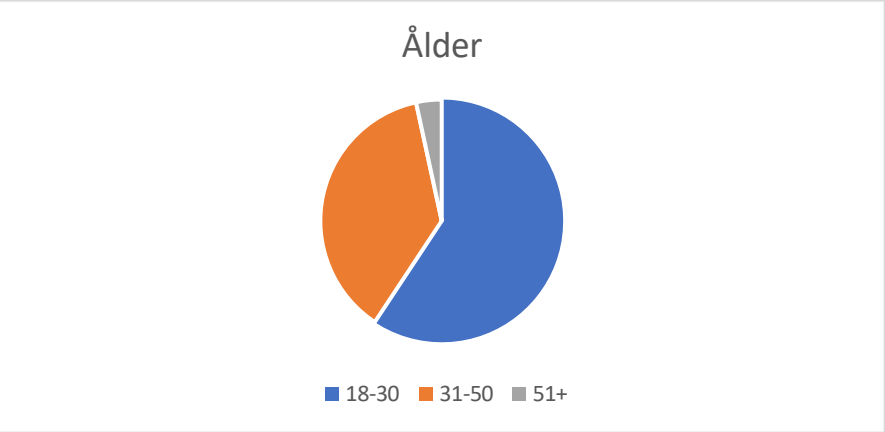
Results and discussion

The survey was conducted between April and May 2024 by distributing questionnaires to the local community, specifically targeting individuals involved in agriculture, including owners, employees, experts, and potential agricultural entrepreneurs

Demographics



The chart breaks down the survey participants by gender. The majority, 60,2% (71 participants), identified as men. Women comprised 36,4% (43 participants), and there were 4 respondents (3.4%) who did not disclose their gender.



The age breakdown of the survey participants is shown in the pie chart. The largest group, at 59,3% (70 participants), falls between 18 and 30 years old. Those aged 31-50 make up 37,3% (44 participants), while 3,4% (4 participants) are over 50.

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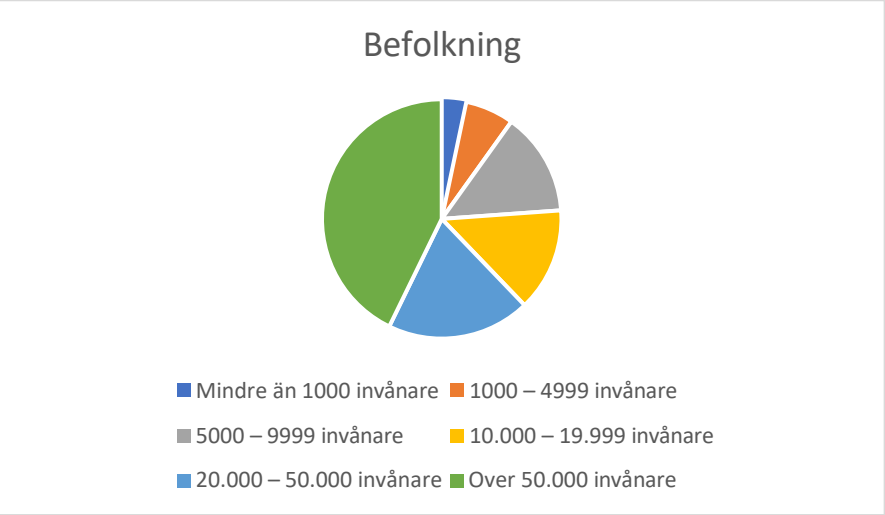
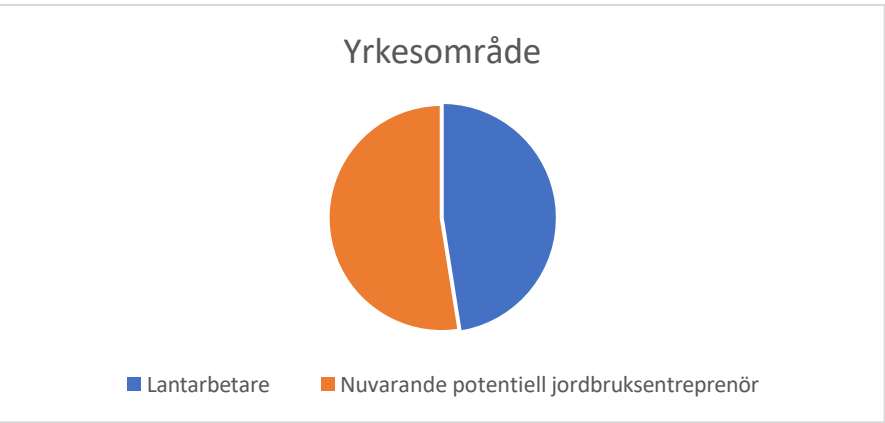


The analysis of respondent residence revealed a geographically diverse distribution across various cities sizes. The most prominent concentration (44.1%, 52 participants) resides in urban areas exceeding 50,000 inhabitants. Notably, a substantial segment inhabits smaller towns, with an even distribution between the 10,000-19,999 (14,4%) and 20,000-50,000 (16,9%) population ranges. A relatively balanced representation exists within even smaller communities: 14.4% (17 participants) reside in towns with populations between 5,000 and 9,999 and another 14.4% (17 participants) between 10,000 and 19,999, while approximately 6.8% (8 participants) inhabit locations with 1,000 and 4,999 inhabitants and 3,4% with less than 1000 inhabitants.

Specific information



The survey revealed that nearly half (47.5%) of the respondents are currently employed in agriculture and a slightly larger proportion (52.5%) identified as existing or potential agricultural entrepreneurs.

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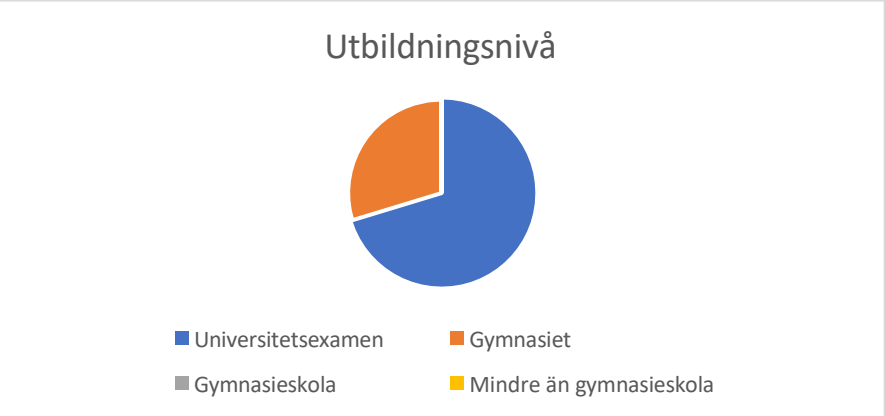
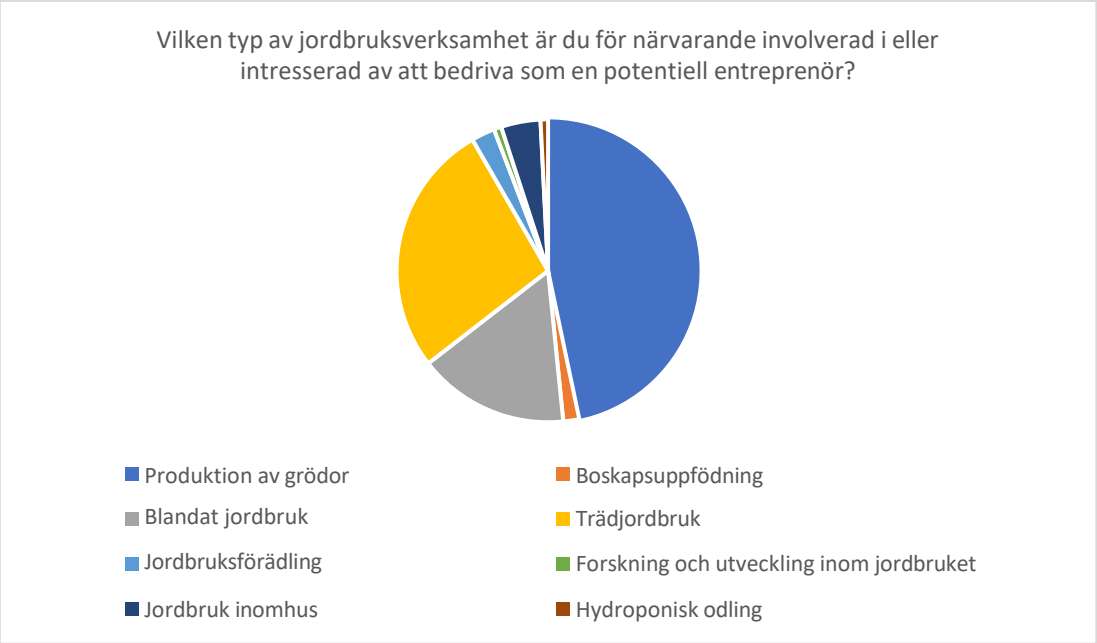


Focusing on the educational background, the chart reveals that 70.3% of respondents possess university degrees. The remaining respondents (29.7%) have completed higher education programs.



The survey revealed a diverse range of agricultural activities currently or possible undertaken by respondents. Nearly half (46.6%, 55 participants) are involved in crop production. Following closely are those engaged in agroforestry (27.1%, 32 participants) and mixed farming (16.1%, 19 participants). Indoor farming follows with 4.2% (5 participants) and agro-processing with 2,5% (3 participants). A small number of respondents indicated involvement in livestock farming (1.7%, 2 participants), with a single participant specifying hydroponics (0.8%) and agricultural research & development (0.8%).

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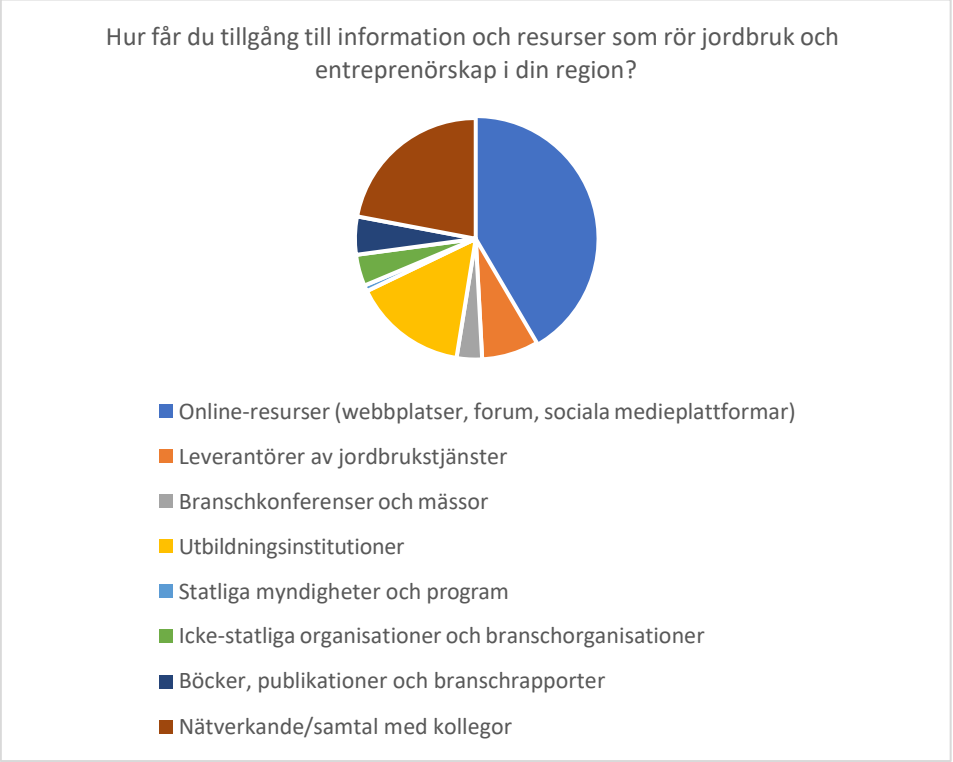
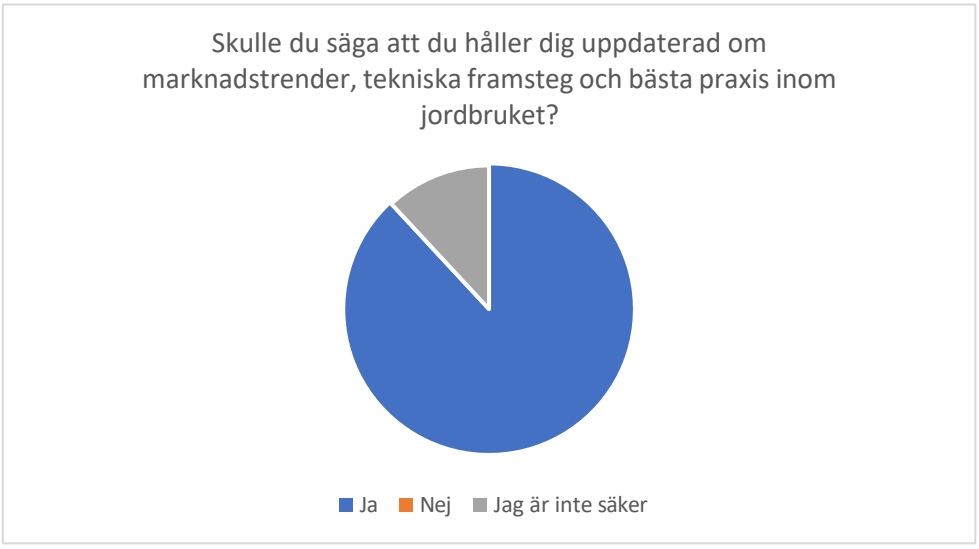


The data reveals three prominent sources for accessing information and resources related to agriculture and entrepreneurship in the participants' regions. Online resources, encompassing websites, forums, and social media platforms, lead the pack with a significant number of responses (49), representing over 41.5% of participants. Networking/peer conversations (26 responses) follow closely behind at 22%, and educational institutions (18 responses) account for 15,3% of participants. Interestingly, a 7,6% of the participants access information through agricultural service providers (9 participants). Books, publications, and industry reports were mentioned by 5,1% (6 participants), NGOs and industry associations were mentioned by 4,2% (5 participants), industry conferences and trade shows by 3.4% (4 participants), and government agencies and programs by 0.8% (1 participant).



The survey assessed the respondents' level of awareness regarding market trends, technological

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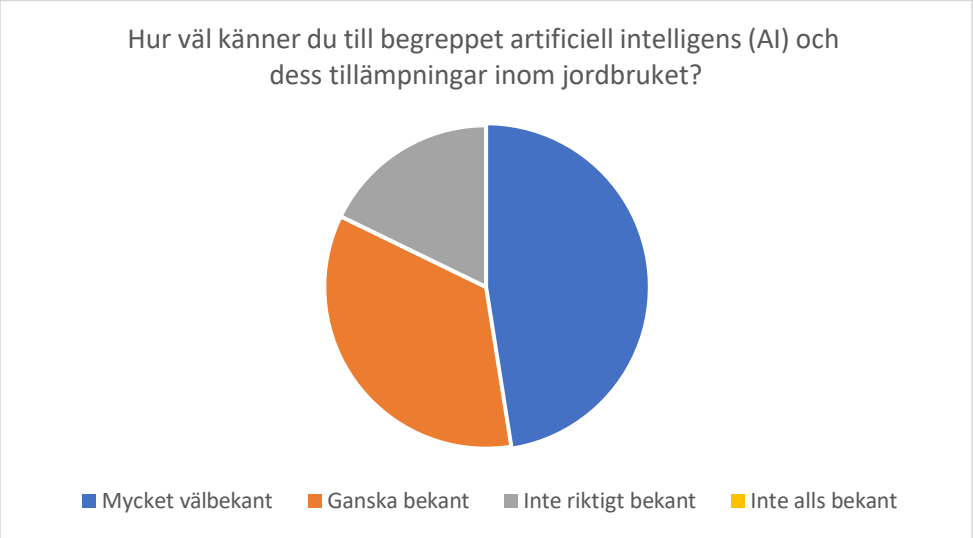
advancements, and best practices within their field. An overwhelming majority (88.1%, 104 participants) indicated that they feel well-informed. The remaining participants (11.9%, 14 participants) expressed uncertainty about their level of awareness.

Digitalisation and AI use



The graph explores the respondents' familiarity with artificial intelligence (AI) and its potential applications in agriculture. A significant portion (47.5%, 56 participants) indicated they are highly familiar with the concept of AI. An additional 34.7% (41 participants) reported being rather familiar. This suggests a strong foundation of AI awareness among a large majority of respondents (82.2%). However, a smaller segment (17.8%, 21 participants) acknowledged they are not really familiar, while none (0%) indicated no familiarity at all.

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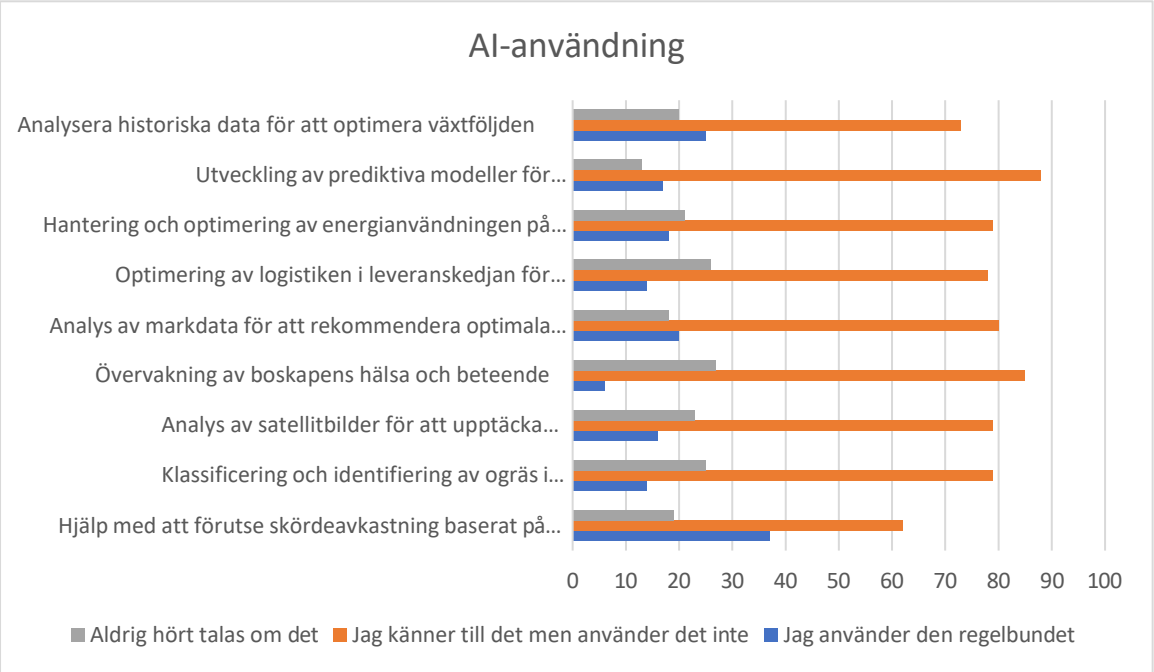
While a notable portion (33.9%, 40 participants) reported personal experience with AI tools, nearly two-thirds (66.1%, 78 participants) indicated they haven't yet utilized them in their practices.



In terms of AI use, the majority of the participants are aware of the AI applications and technologies but there is a significant gap between awareness and adoption. More specifically, “Assistance in predicting crop yields based on weather data and historical trends”, 37 respondents answered that they use it regularly, 62 responded that they know about it but do not use it and 19 responded that they do not know it at all. “Classifying and identifying weeds in agricultural fields” is used by 14 respondents, while 79 have heard about it but do not use it and 25 have never heard about it. “Analysis of satellite imagery to detect crop health issues” is regularly used by 16 respondents, 79 respondents have heard about it but do not use it and 23 have never heard about it. “Monitoring livestock health and behavior” is used by 6 people, while 85 have heard about it but do not use it and 27 do not know about it at all. In terms of “Analysing soil data to recommend optimal crop planting strategies”, 20 respondents know it and use it regularly, 80 have heard about it but do not use it and 18 do not know about it at all. Regarding “Optimising supply chain logistics for agricultural products”, 14 people know about and use AI tools, 78 people know about it but have never used it and 26 do not know about it at all. 18 people use AI technologies for managing and optimizing energy usage on farms, 79 have heard about it but never used it and 21 have never heard about it. 17 people know about and use AI tools for the development of predictive models for disease outbreaks in crops or livestock, 88 have heard about it but do not use it and 13 do not know about it at all. Finally, only 25 participants know about and use AI tools to analyse historical data to optimize crop rotation practices while 73 have heard about it but do not use it and 20 do not know about it at all.

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In terms of the main challenges encountered in adopting digital technologies and AI in their agricultural activities, 47,5% responded that main challenge is the cost for software, training and infrastructure, the 16,9 reported the integration with existing systems, 12,7% chose as the main challenge the data privacy and security concerns, the 11% chose the lack of awareness and education, only 4,2% responded that the main challenge is the limited technical support as well as the 4,2% chose that is too complex and hard to understand. Finally, 3,4% chose as the main challenge reliability and accuracy.

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Regarding the knowledge of government initiatives or programmes aimed at promoting digitilisation and AI uses in agriculture, the vast majority (72%) answered that they are not aware of such initiatives while 24,6% responded that they do, not further elaborating. A total of 3,3% mentioned specific initiatives such as RISE and AI-kommission.

In the question “Do you believe that AI has the potential to improve efficiency and productivity in agricultural practices?”, the vast majority has responded positively (94,1%) and only 5,9% that they are not sure.

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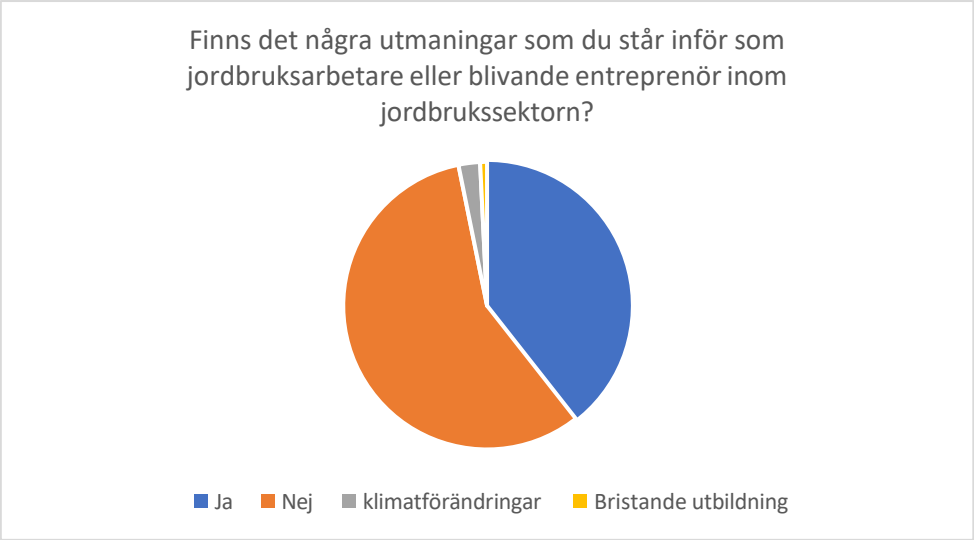
Regarding the question “Do you think AI can help in addressing environmental challenges, such as climate change and resource depletion, in agriculture?” 98,3% (116 participants) of the respondents state that they believe so, 1,7% (2 participants) that they are not sure.

Summary



Regarding the challenges that the respondents face when it comes to their agricultural activities, 59,3% (70 participants) mention that they are not facing challenges and 37,3% (44 participants) that they do. 2,5% specifies climate change as the main challenge and 0,8 the lack of education.

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In terms of the question “Do you think there is enough support available, such as funding and technical assistance, to help farmers and agricultural businesses adopt AI and digital technologies?”, 77,1% of the participants (n=91) replied Yes, 11,9% (n=14) replied that they are not sure and 11% replied No (n=13).

Regarding the expression of interest in participating in training programs or workshops focused on AI and digital technologies in agriculture, 90,7% of the respondents answered that they would be interested and 9,3% that they would not be interested in such programs.

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Conclusions and Recommendations

The main conclusion of the needs assessment survey in Sweden is that there is a high level of awareness about AI, with 82.2% of respondents familiar with its concepts but this is not associated with hand-on experience in AI applications. There is a notable gap between awareness and actual adoption, with only 33.9% having personal experience with AI tools, indicating a need for practical training and demonstrations to convert awareness into adoption.

There was a strong belief in AI's potential for sustainability, but less certainty about efficiency impact, thus there should be further communication of the impact and benefits of AI, backed by research and case studies, in order to increase confidence in AI's role in productivity.

Most respondents feel there is adequate support, and many are interested in further training, thus expanding existing support programs and developing new ones focusing on AI training will be beneficial.

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

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

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