AI4Agri

Developing green and digital skills towards AI use in agriculture

Erasmus+

KA220-VET - Cooperation partnerships in vocational education and training

WPX: ….

Name of Deliverable

Developed by

XXX

Month/Year

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Executive Summary

The following report contains a brief introduction to the topic as well as an analysis of the methodology that was followed for the data collection and analysis. The report includes results and discussion section where quantitative and qualitative research is presented. At the end of the report a number of conclusions and recommendations on the basis of the research and analysis that was made. The set of recommendations could be utilized to design and develop the Final AI4Agri Analysis.

Introduction

The AI4Agri project emerges as a crucial initiative within the European Union's agricultural landscape, recognizing agriculture's pivotal role in climate mitigation endeavors. By prioritizing environmental sustainability and digital transformation, AI4Agri not only fosters awareness of AI's potential in agriculture but also cultivates the necessary skills and capacities for its adoption. Through targeted vocational education and training programs, the project ensures that agricultural workers and entrepreneurs are equipped with cutting-edge knowledge and competencies, thus driving workforce adaptation to emerging trends while advancing the Sustainable Development Goals and the EU's environmental objectives.

This report aspires to provide data and insights regarding the agricultural workers and existing/potential entrepreneurs.

Methodology

In order the appropriate data to be collected, both qualitative and quantitative data collection methods were used.

Quantitative research is expressed in numbers and graphs. It is used to test or confirm theories and assumptions. This type of research can be used to establish generalizable facts about a topic. (Streefkerk, 2019). Common quantitative methods include experiments, observations recorded as numbers, and surveys with closed-ended questions.

Qualitative research is expressed in words. It is used to understand concepts, thoughts or experiences. This type of research enables you to gather in-depth insights on topics that are not well understood. Common qualitative methods include interviews with open-ended questions, observations described in words, and literature reviews that explore concepts and theories. (ibid.)

Results and Discussion

The survey was carried out in April 2024 by distributing questionnaires among the local community, especially people connected with agriculture (owners, employees, experts) as well as potential agricultural entrepreneurs.

Demographics

Płeć:
105 odpowiedzi

- Mężczyzna
- Kobieta

43,8%

56,2%
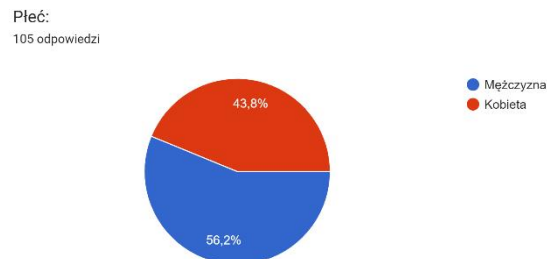
The diagram demonstrates the respondents' gender division as almost half and a half. 46 of the respondents identified as female and 59 as men.

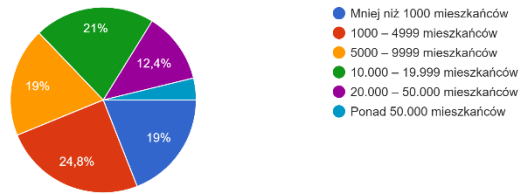Wiek:
105 odpowiedzi

- 18-30
- 31-50
- 51+

41,9%

57,1%
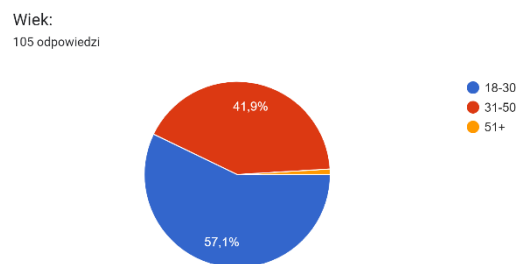
The diagram demonstrates that 57% of the respondents are between 18 and 30 years old and almost 42% are aged between 31 and 51. Only one person was aged over 51.

Kraj:
105 odpowiedzi

- Polska
- Szwecja
- Cypr
- Grecja

100%
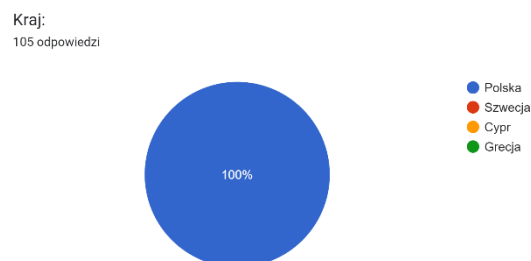
The diagram demonstrates that all of the participants of the survey were from Poland.

Ludność miejsca zamieszkania:
105 odpowiedzi

- Mniej niż 1000 mieszkańców
- 1000 – 4999 mieszkańców
- 5000 – 9999 mieszkańców
- 10.000 – 19.999 mieszkańców
- 20.000 – 50.000 mieszkańców
- Ponad 50.000 mieszkańców

This question resulted in most varied answers in the section with almost 25% of respondents living in a place with population estimated at 1.000-4.999 inhabitants and 21% lives in a location with 10.000 – 19.999 inhabitants. The same percentage (19%) concerns both groups with 5.000-9.999 and with less than 1.000 inhabitants. 13 people stated that they live in a city of 20.000 – 50.000 inhabitants and only 4 people live in a city of over 50.000 inhabitants.
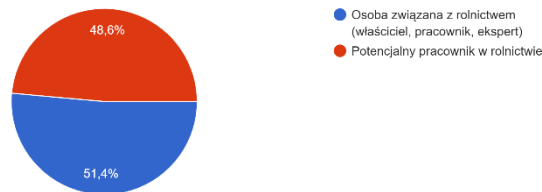
Specific information

Wykształcenie:
105 odpowiedzi

Legend:
- Wyższe
- Średnie
- Podstawowe
- Poniżej podstawowego

41%
58,1%
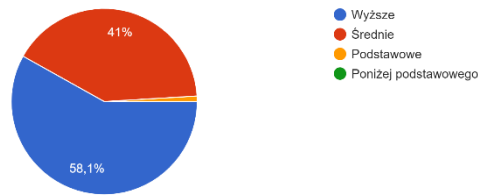
The diagram demonstrates that 58% of the respondents graduated from a university and 41% got higher education. Only one person had education level lower than secondary school.
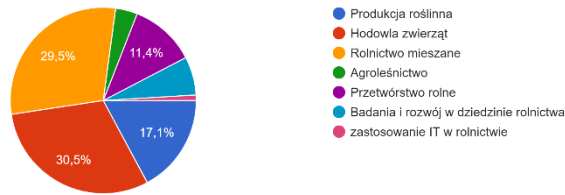
Zatrudnienie:
105 odpowiedzi

Legend:
- Osoba związana z rolnictwem (właściciel, pracownik, ekspert)
- Potencjalny pracownik w rolnictwie

48,6%
51,4%

The diagram demonstrates that 54 respondents are connected to agriculture (owners, employees, experts) and 51 people are potential/future agrientrepreneurs.
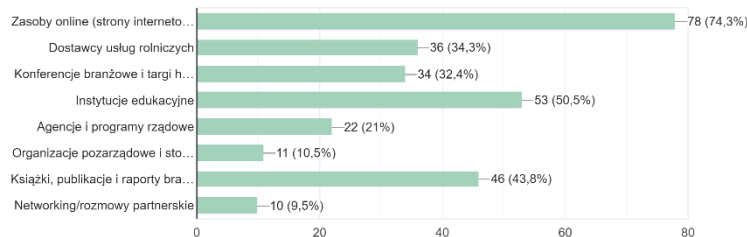
W jaki rodzaj działalności rolniczej jesteś obecnie zaangażowany lub zainteresowany jako potencjalny przedsiębiorca?
105 odpowiedzi

- Produkcja roślinna
- Hodowla zwierząt
- Rolnictwo mieszane
- Agroleśnictwo
- Przetwórstwo rolne
- Badania i rozwój w dziedzinie rolnictwa
- zastosowanie IT w rolnictwie

The diagram demonstrates a large variety in types of agricultural activities they are currently involved in or interested in pursuing as potential entrepreneurs.

The largest groups represent livestock farming (30.5%) and mixed farming (29.5%). Then 17% is represented by crop production and over 11% by agro-processing. The smallest numbers show in agricultural research and development (6.7%) and agroforestry (3.8%). There was also one person representing use of IT in agriculture.

W jaki sposób uzyskujesz dostęp do informacji i zasobów związanych z rolnictwem i przedsiębiorczością w swoim regionie?
105 odpowiedzi

Zasoby online (strony interneto...	78 (74,3%)
Dostawcy usług rolniczych	36 (34,3%)
Konferencje branżowe i targi h...	34 (32,4%)
Instytucje edukacyjne	53 (50,5%)
Agencje i programy rządowe	22 (21%)
Organizacje pozarządowe i sto...	11 (10,5%)
Książki, publikacje i raporty bra...	46 (43,8%)
Networking/rozmowy partnerskie	10 (9,5%)

The numbers in this questions show three major sources of accessing information and resources related to agriculture and entrepreneurship in the participants' regions being: online resources such as websites, forums, social media platforms (78 responses), educational institutions (53 responses), and books, publications, and industry reports (46 responses). Then, a total of almost 88% accesses information from agricultural service providers, industry conferences and trade shows, and government agencies and programs. Lastly, 20% of participants stated that they gain information from NGOs and industry associations as well as networking/peer conversations.

Czy powiedziałbyś, że jesteś na bieżąco z trendami rynkowymi, postępem technologicznym i najlepszymi praktykami w rolnictwie?
105 odpowiedzi

- Tak
- Nie
- Nie mam pewności
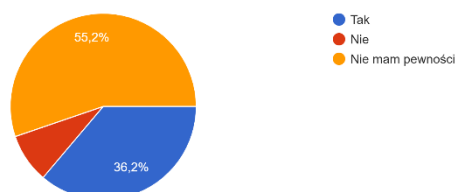
The diagram shows that over a half of the respondents stated that they are not sure if they are up to date with market trends, technological advancements, and best practices in agriculture. 38 people stated that they are surely updated well and 9 responded they are not up to date.
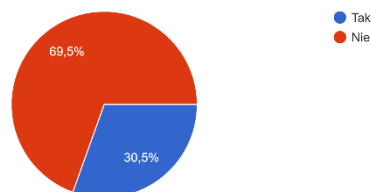
Digitalisation and AI use
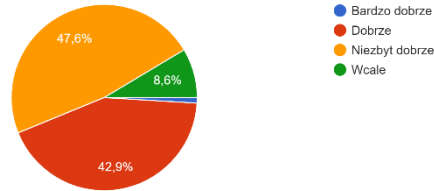
Over half of the respondents stated that they are not well (47.6%) or not at all (8.6%) familiar with the concept of artificial intelligence (AI) and its applications in agriculture. Roughly 43% are familiar and only one person is well oriented in the topic.

Almost 70% of the participants stated that they haven't personally used any AI-powered tools or technologies in their agricultural activities. 30.5% responded that they used it personally.
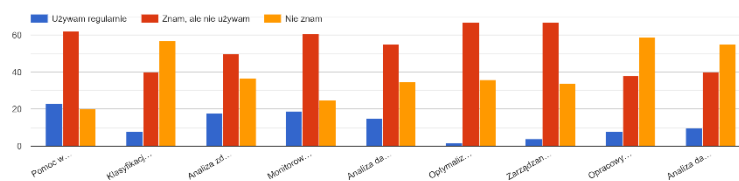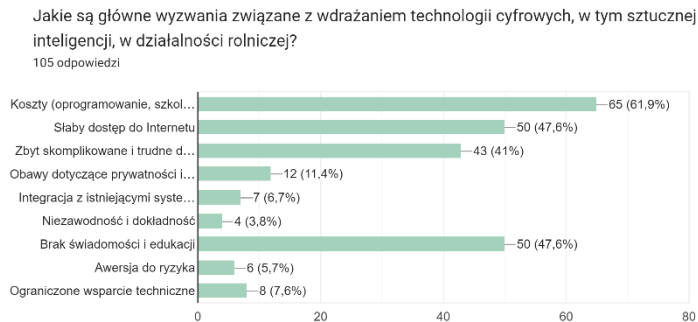

Regarding the use of AI, most of the sentences were rated as "I know about it but do not use it".

Assistance in predicting crop yields based on weather data and historical trends is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all. *Classifying and identifying weeds in agricultural fields* is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all. *Analysis of satellite imagery to detect crop health issues* is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all. *Monitoring livestock health and behavior* is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all. *Analysing soil data to recommend optimal crop planting strategies* is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all. *Optimising supply chain logistics for agricultural products* is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all. *Managing and optimizing energy usage on farms* is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all. *Development of predictive*

models for disease outbreaks in crops or livestock is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all. *Analysing historical data to optimize crop rotation practic* is used by 23 of our participants, 62 of them know it but do not use, and 20 do not know it at all.

Jakie są główne wyzwania związane z wdrażaniem technologii cyfrowych, w tym sztucznej inteligencji, w działalności rolniczej?
105 odpowiedzi

Regarding the main challenges that the participants face in adopting digital technologies, including AI, in their agricultural operations, most of the respondents (62%) stated that it is caused by costs (software, training, infrastructure).
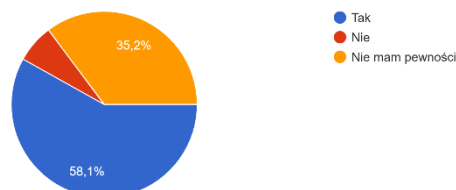
A 100 people voted for poor Internet access (47.6%) and lack of awareness and education (47.%). Next in line was "Too complex and hard to understand" (41%). The lover rates were given to: Data privacy and security concerns (11.4%), limited technical support (7.6%), integration with existing systems (6.7%), risk aversion (5.7%), and reliability and accuracy (3.8%).

Czy znasz jakieś inicjatywy lub programy rządowe mające na celu promowanie cyfryzacji i wdrażania sztucznej inteligencji w rolnictwie?
105 odpowiedzi
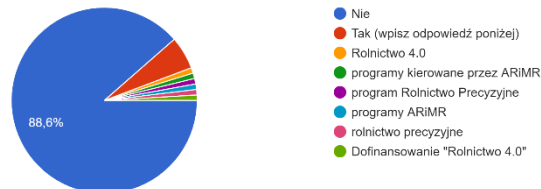
In the question "Are you aware of any government initiatives or programs aimed at promoting digitalization and AI adoption in agriculture?" most of the participants (88.6%) responded that they are not aware of any initiatives of this type. Only six respondents (5.7%) pointed at specific programmes which were: agriculture 4.0, precision agriculture, and lastly programmes managed by the Agricultural Restructuring and Modernisation Agency.

Czy uważasz, że sztuczna inteligencja ma potencjał do poprawy wydajności i produktywności w praktykach rolniczych?
105 odpowiedzi

Over half of the respondents (58.1%) stated that they believe that AI has the potential to improve efficiency and productivity in agricultural practices. Only 6.7% didn't agree, and the rest of the group (35.2%) was not sure.

Czy uważasz, że sztuczna inteligencja może pomóc w sprostaniu wyzwaniom środowiskowym, takim jak zmiany klimatu i wyczerpywanie się zasobów w rolnictwie?
105 odpowiedzi

- Tak
- Nie
- Nie mam pewności

37,1%

13,3%

49,5%
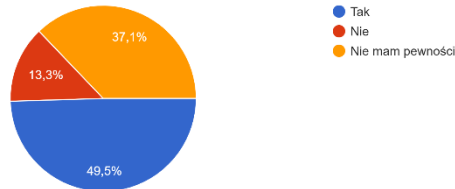
Nearly half of the respondents (49.5%) stated that they think AI can help in addressing environmental challenges, such as climate change and resource depletion, in agriculture. As much as 13.3% didn't agree with this, while 37.1% were not sure.
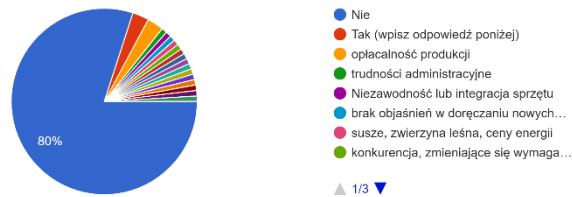
Summary

Czy są jakieś wyzwania, przed którymi stoisz jako pracownik rolny lub początkujący przedsiębiorca w sektorze rolnym?
105 odpowiedzi

- ● Nie
- ● Tak (wpisz odpowiedź poniżej)
- ● opłacalność produkcji
- ● trudności administracyjne
- ● Niezawodność lub integracja sprzętu
- ● brak objaśnień w doręczaniu nowych…
- ● susze, zwierzyna leśna, ceny energii
- ● konkurencja, zmieniające się wymaga…

▲ 1/3 ▼

Regarding the challenges participants face as agricultural workers or aspiring entrepreneurs in the agricultural sector, most of the respondents (80%) stated that there do not face any.

The remaining 20% pointed at: profitability of production, administrative difficulties, reliability or integration of equipment, lack of explanation in the delivery of new EU aid schemes, droughts, forest animals, energy prices, competition, changing demands, difficulty in selling crops, concerns about privacy, prices of products, fear for one's privacy, gaining access to the web, uncertainty of the industry, too much bureaucracy for officials, prices, red tape for authorities, bureaucratisation.

Czy uważasz, że dostępne jest wystarczające wsparcie, takie jak finansowanie i pomoc techniczna, aby pomóc rolnikom i przedsiębiorstwom rolnym we w… sztucznej inteligencji i technologii cyfrowych?
105 odpowiedzi

- ● Tak
- ● Nie
- ● Nie mam pewności
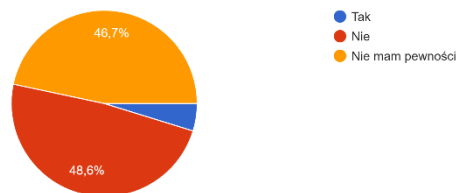
The votes in the question regarding enough support being available, such as funding and technical assistance, to help farmers and agricultural businesses adopt AI and digital technologies, the votes were divided. Most of the participants (48.6%) didn't agree with this statement and only 4.8% stated that the support is enough. The remaining 46.7% were not sure.

Czy byłbyś zainteresowany udziałem w programach szkoleniowych lub warsztatach poświęconych sztucznej inteligencji i technologiom cyfrowym w rolnictwie?
105 odpowiedzi

- ● Tak
- ● Nie
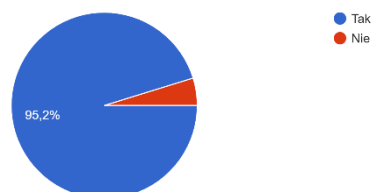
The question regarding being interested in participating in training programs or workshops focused on AI and digital technologies in agriculture was received rather positively as almost all of the respondents (95.2%) stated that they would like to participate in such initiatives. Only 5 people were not sharing interested in the opportunity.

Czy są jakieś dodatkowe uwagi lub obawy, którymi chciałbyś się podzielić?
105 odpowiedzi

- Nie
- Tak (wpisz odpowiedź poniżej)

100%
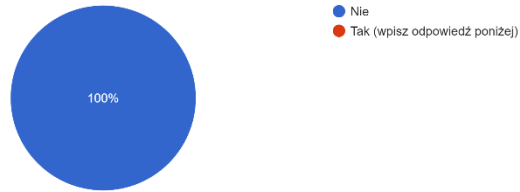
Lastly, there were no additional comments or thoughts.

Conclusions and Recommendations

The survey carried out showed that the Polish public has an average knowledge of the main adaptive factors of the technology use in agriculture. However, when going into detail and asking for specific, more detailed information, they mostly lacked a wide range of knowledge.

The survey displayed that the areas in which Poles are most lacking in knowledge and which should be discussed more widely include:

- The concept of artificial intelligence (AI) and its applications in agriculture;
- Use of any AI-powered tools or technologies in the agricultural activities;
- AI use in the context of classifying and identifying weeds in agricultural fields;
- AI use in the context of development of predictive models for disease outbreaks in crops or livestock;
- AI use in the context of analysing historical data to optimize crop rotation practices;
- Governmental initiatives or programs aimed at promoting digitalization and AI adoption in agriculture;
- Support available, such as funding and technical assistance, to help farmers and agricultural businesses adopt AI and digital technologies.

This situation illustrates the reality in Polish agriculture and underlines the real need to implement projects such as AI4Agri in order to sensitise farmers and other agricultural workers, bot current and future ones, to important issues and increase their knowledge and competence.