AWARENESS OF ARTIFICIAL INTELLIGENCE (AI) IN PRECISION AGRICULTURAL

Ms. S. Vasundharadevi Ph.D (Full-Time) Research Scholar PG & Research Department of Commerce Nallamuthu Gounder Mahalingam College Pollachi.
Dr. M. V. Sathiyabama Associate Professor and Head of the Department Commerce (E-Commerce) Nallamuthu Gounder Mahalingam College Pollachi.

Abstract
This study explores the awareness and perceptions of Artificial Intelligence (AI) in precision agriculture among farmers in Coimbatore District. Using a survey of 52 respondents, using the analysis are Simple percentage analysis and the Chi-square test ,Mean score analysis.The research examines how demographic factors such as age, gender, and income influence AI awareness. The findings reveal limited knowledge of AI applications, especially among older and lower-income groups. Better decision-making is seen as the most valuable benefit of AI, while reducing labor is less recognized. Education and occupation showed little impact on awareness levels. The study highlights the need for targeted training, government support, and enhanced collaboration to improve digital literacy. Increasing awareness is crucial to help farmers adopt AI-driven practices for sustainable and efficient agriculture. This research underscores the importance of accessible technology and outreach in bridging the knowledge gap.

Keywords:
Artificial Intelligence (AI),Precision Agriculture,Smart Farming.,etc

Introduction:

Artificial Intelligence (AI) is playing an increasingly important role in modern agriculture, especially in the field of precision farming. By using AI-powered technologies such as sensors, drones, and data analytics, farmers can monitor crops more closely, manage resources efficiently, and make smarter decisions. These innovations have the potential to improve crop yields and reduce environmental harm. However, the extent to which farmers are aware of and understand AI's applications varies widely, particularly in rural and less developed regions.

Many farmers face challenges related to limited exposure to new technologies, lack of technical knowledge, and insufficient digital infrastructure. Additionally, social and economic factors, including education levels and access to training programs, affect how readily AI solutions are adopted in farming communities. Without adequate awareness and support, the benefits of AI in agriculture remain out of reach for many.

To maximize the positive impact of AI on farming, it is essential to improve awareness through education, extension services, and accessible training tailored to local needs. Encouraging collaboration between technology developers, policymakers, and farmers can help create AI tools that are easy to use and relevant to diverse agricultural environments. Raising awareness and understanding of AI will be key to driving its adoption and enabling farmers to embrace innovative practices that promote sustainability and food security.

Objectives

- To evalute the general awareness of Artificial Intelligence (AI) among individuals related to agriculture.
- To assess perceptions about AI's ability to reduce water and fertilizer use in farming.
- To rank the importance of various benefits of AI in precision agriculture, such as crop yield increase and pest detection.

Review of the Literature

· **Mostafa Eiss (2025) "**Precision agriculture using artificial intelligence and robotics**"** This knowledge helps make better decisions about watering, giving fertilizer, and controlling pests, which reduces waste and helps the environment.

· **Garima Gupta Sudhir Kumar Pal (2025) "**Applications of AI in precision agriculture**"** Precision agriculture aims to grow more crops while protecting the environment.Artificial intelligence plays a big role in improving this, making predictions about soil, diseases, pests, and weeds more accurate. It also helps manage resources better and supports better decision-making. The review also looks at future AI technologies in agriculture like climate prediction, smart livestock farming, and vertical farming.

· **Waleed K.Alazzai (2024) "**Precision Farming: The Power of AI and IoT Technologies**"** This paper looks at how advanced technologies such as AI, IoT, remote sensing, and GIS can be used to deal with challenges like fewer agricultural resources and a growing population. The article reviews where precision farming stands today and what it might look like in the future, emphasizing how it can boost productivity while reducing environmental harm.

· **Nguyen Thanh Son (2024) "**Towards Artificial Intelligence Applications in Precision and Sustainable Agriculture**"** The use of AI in smart farming involves using sensors, drones, and satellite images to keep track of crop health, soil conditions, and weather.AI in precision farming brings about a shift toward smarter, more informed decision-making.

· **G.Mahibha (2023) "**Impact of Artificial Intelligence in Agriculture with Special Reference to Agriculture Information Research**"** The role of Artificial Intelligence is unavoidable in all areas of business and technology, and it will have a significant impact on education in the future. The agriculture sector faces many challenges, including information on pest control techniques, maximizing crop yield, improper soil treatment, pest control systems, disease control information, and details about farm technology and innovation.

Research methodology

The Study was based on Survey Method.. Both Primary and Secondary data has been used.The primary data was collected From 52 respondance in Coimbatore District. The Collected data is analysed using Simple percentage analysis was used to summarize the awareness levels of respondents, and the Chi-square test helped identify relationships between demographic factors and AI awareness. Mean score analysis is a statistical method used to determine the average importance or preference of different variables based on respondent ratings.Secondary data was collected from Magazines,Journals.,etc

Table:1.1

Simple percentage Analysis for Demographic Area

Name of the Variables	No of respondents	Percentage
Age		
Age Below 25	18	34.6
Age 26-35	32	61.5
Age 36-50	2	3.8
Total	**52**	**100.0**
Gender		
Male	23	44.2
Female	29	55.8
Total	**52**	**100.0**
Occupation		
Farmer	4	7.7
Student	6	11.5
Professional	29	55.8
Agricultural Extension Officer	13	25.0
Total	**52**	**100.0**
Education Qualification		

No Formal Education	4	7.7
Primary	4	7.7
Secondary	8	15.4
Undergraduate	22	42.3
Postgraduate	6	11.5
Doctoral Degree	8	15.4
Total	**52**	**100.0**
Monthly Income		
Rs 10000-20000	17	32.7
Rs 20001-30000	19	36.5
Rs 30001-40000	7	13.5
Rs 40001-50000	5	9.6
More Than Rs 50000	4	7.7
Total	**52**	**100.0**
Family Size		
1-3 Members	31	59.6
4-5 Members	15	28.8
Above 5 Members	6	11.5
Total	**52**	**100.0**
Family Members in Farming		
1 Person	27	51.9
2–3 People	25	48.1
Total	**52**	**100.0**

Interpretation

Age Distribution

Most of the individuals surveyed (61.5%) fall within the 26–35 age group, pointing to a largely young adult population. Another 34.6% are under the age of 25, and only 3.8% are aged between 36 and 50.

Gender

There is a slight female majority among respondents, with 55.8% being women and 44.2% men. This shows a fairly balanced participation from both genders.

Occupation

The dominant profession among respondents is in the professional sector, accounting for 55.8%. Agricultural extension officers make up 25%, followed by students at 11.5% and farmers at 7.7%. This indicates a diverse group, with a strong representation from professional and agricultural fields.

Educational Qualification

Undergraduate degree holders form the largest group at 42.3%. Additionally, 15.4% each have either secondary or doctoral qualifications. A smaller proportion 15.4% combined have only primary education or no formal schooling at all, showing that most respondents have received a good level of education.

Monthly Income

A significant portion (69.2%) earns between Rs 10,000 and Rs 30,000 per month. The remaining 30.8% have monthly earnings above Rs 30,000. This points to a concentration in the lower to mid-income levels.

Family Size

Most respondents (59.6%) live in small families with up to three members. About 28.8% belong to families of four to five members, while only 11.5% come from larger households with more than five people.

Family Members in Farming

Slightly more than half (51.9%) reported having one family member involved in farming. The rest (48.1%) have two to three members participating in agricultural work. This suggests that farming is still an important occupation within many families.

Table:2.1

Chi-Square(χ^2) Analysis For State Your Awareness About Ai In Agriculture

S.No	Variable	Dependent variable	χ^2 *value*	*P-Value*	*Out-turn*
1	Age	Awareness	*12.322*	*.015*	***Significant at 5%***
2.	Gender	Awareness	*11.532*	*.003*	***Significant at 1%***
3.	Occupation	Awareness	*5.426*	*.490*	Not significant
4.	Educational Qualification	Awareness	*7.213*	*.705*	Not significant
5.	Monthly Income	Awareness	*35.975*	*.000*	***Significant at 1%***
6.	Family Size	Awareness	*7.692*	*.104*	Not significant
7.	Family Members in Farming	Awareness	*1.692*	*.429*	Not significant

Interpretation of Chi-Square Test Results on Awareness

The Chi-square analysis was conducted to examine the relationship between various demographic variables and awareness. The significance of each variable was assessed based on its p-value, using thresholds of 1% and 5%.

Age showed a statistically significant association with awareness at the 5% level (p = 0.015). This suggests that awareness levels vary meaningfully across different age groups.

Gender had a strong influence on awareness, with a p-value of 0.003. This result is significant at the 1% level, indicating a highly significant difference in awareness between male and female respondents.

Occupation was not significantly related to awareness (p = 0.490). This indicates that awareness does not differ significantly across different occupational groups.

Educational Qualification also did not show any meaningful association with awareness (p = 0.705), implying that education level does not significantly impact awareness in this context.

Monthly Income had a highly significant relationship with awareness (p = 0.000), well below the 1% threshold. This result suggests that income plays a major role in determining an individual's level of awareness.

Family Size did not have a statistically significant impact on awareness (p = 0.104), indicating no strong evidence that the number of family members influences awareness.

Family Members in Farming was also found to be not significantly related to awareness (p = 0.429), suggesting that having more family members involved in farming does not necessarily affect awareness levels.

Table:3

Rank the awareness of AI in precision agriculture that you think is most important(1 = Most important, 5 = Least important)

Name of the Variable	Mean Value	Rank
Increasing crop yield	2.29	**3**
Saving water and fertilizers	2.23	**4**
Early detection of pests and diseases	2.42	**2**
Reducing labor and physical work	1.96	**5**
Better decision-making for farming	2.52	**1**

Interpretation for Mean Score Rank Analysis

The data shows that better decision-making in farming is considered the most important benefit. Early detection of pests and diseases follows closely in priority. Increasing crop yield is also valued but slightly less so. Saving water and fertilizers holds moderate importance. Reducing labor and physical effort is viewed as the least important among the listed factors.

Conclusion

The findings clearly show that awareness of AI in precision agriculture is still limited, especially among certain demographic groups. Age, gender, and income significantly affect the level of

understanding, while education and occupation do not show strong influence. Better decision-making is perceived as the top benefit of AI, reflecting its value in informed farm management. Surprisingly, reducing labor was considered the least important, suggesting a lack of recognition for AI's potential to ease manual work. Most respondents come from younger age groups with moderate incomes, yet exposure to AI remains low. Income plays a critical role in access to technology and information. To close the awareness gap, targeted training and outreach are essential. Government support, extension services, and local campaigns can improve digital readiness. Collaboration between farmers, researchers, and tech developers must be strengthened. Building awareness is the first step toward integrating AI for smarter, more sustainable farming.

Reference

- Adli, H.K., Remli, M.A., Wan Salihin Wong, K.N.S., Ismail, N.A., González-Briones, A., Corchado, J.M. & Mohamad, M.S. 2023. Recent Advancements and Challenges of AIoT Application in Smart Agriculture: A Review. NLM (Medline)
- Delgado, J.A., Short, N.M., Roberts, D.P. & Vandenberg, B. 2019. Big Data Analysis for Sustainable Agriculture on a Geospatial Cloud Framework. Frontiers Media S.A
- Gajjar, R., Gajjar, N., Thakor, V.J., Patel, N.P. & Ruparelia, S. 2022. Real-time detection and identi□cation of plant leaf diseases using convolutional neural networks on an embedded platform. Visual Computer 38(8): 2923–2938
- Chauhan P, Sharma N, Tapwal A, Kumar A, Verma GS, Meena M, et al. Soil microbiome: diversity benefits and interactions with plants. Sustainability. 2023;15:14643.
- Suman J, Rakshit A, Ogireddy SD, Singh S, Gupta C, Chandrakala J. Microbiome as a key player in sustainable agriculture and human health. Front Soil Sci. 2022.
- Owebor, K., Diemuodeke, O.E., Briggs, T.A., Eyenubo, O.J., Ogorure, O.J. and Ukoba, M.O., 2022. Multi-criteria optimisation of integrated power systems for low-environmental impact. Energy Sources, Part A: Recovery, Utilization, and Environmental Effects, 44(2), pp.3459-3476.
- Little, J., Knights, P. and Topal, E., 2013. Integrated optimization of underground mine design and schedulings. Journal of the Southern African Institute of Mining and Metallurgy, 113(10), pp.775-785.
- https://doi.org/10.3390/su151914643
- https://doi.org/10.3389/fsoil.2022.821589
- https://doi.org/10.3390/plants12091852
- https://www.researchgate.net/profile/Adebunmi