© MAY 2026 | IRE Journals | Volume 9 Issue 11 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I11-1718423

Recent Trends of Artificial Intelligence in Agriculture Sector

G. PANDISELVI[1], S. JONEY BABAYAL[2]
[1,2] *Department of Computer Science, Ayya Nadar Janaki Ammal College, Autonomous, Sivakasi,*

Abstract- ***The project titled as "Recent Trends of Artificial Intelligence in Agriculture Sector". The main objective of this project is to improve the farming. leveraging sensors and various IoT-based technologies to monitor crop and soil health. Various AI and machine learning tools are being used to predict the optimal time to sow seeds, get alerts on risks from pest attacks, and more. real-time data analytics on data-streams coming from multiple sources to build an efficient and smart supply chain. Automation system is used in this project for efficient cultivation and improve farming. This technique helps to prevent tillage from various types of weather conditions***

I. INTRODUCTION

Agriculture plays a vital role in India's economy. Almost about 58% of rural house hold depends on agriculture. Compare to olden days we have lot many techniques to improve agriculture growth.

Agriculture stands for world's largest economy. The agriculture situation in India is in worst condition.

The people when they become educated are not even looking at their farms back. They are not even ready or have wealth to educate their children in high standards. These agriculturists are mainly affected with the climate changes. Earlier in ancient days they require more men for agriculture but now we need less man power. There are lot many technologies to improve the agriculture growth. Especially AI plays important role on agriculture

Existing planting
In ancient days we don't have new technology so that is the growth is slow. It also requires more manpower but now we don't need that much manpower. There are also many factors which are affecting agriculture like climate. Due to drastic climate change or flood affects agriculture badly. This directly affects farmer as they totally depend on agriculture for their livelihood.

Disadvantage of Existing planting
In Ancient days No one is ready to give more focus for agriculture and There is no proper rains so the agriculture is becoming difficult.
also, other major problem is the climate conditions farmers have to face lots of losses due to changing or unpredictable climate.

Current planting system
Agriculture is base of living beings, the present situation of agriculture is better than ancient time because in presents world we have lots of technologies especially AI, it changes the method of agriculture due to technology reduce manpower, labour cost and time this time invest one time and take lots of benefit by using that technology.

Scope of AI in agriculture
Agriculture is seeing rapid adoption of Artificial Intelligence (AI) and Machine Learning (ML) both in terms of agricultural products and in-field farming techniques. Cognitive computing in particular, is all set to become the most disruptive technology in agriculture services as it can understand, learn, and respond to different situations (based on learning) to increase efficiency.

AI Applications
AI is adding new dimensions to the agricultural field with several applications of agricultural robots, drones, crop & soil monitoring and predictive analysis. On the basis of the data related to water stress, nutrient content, images of crops, climate and soil moisture content, AI aids in the prediction of the disease and its cure. Issues such as global warming, growing population, and food security concerns forced the innovations and technological

© MAY 2026 | IRE Journals | Volume 9 Issue 11 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I11-1718423

advancements in agriculture. According to the UN Food and Agricultural Organization (FAO), global population is going to increase its reach up to 9.2 billion by 2050, which means in the next 33 years there will be 2 billion more people on this earth with limited resources. So only increasing plantation doesn't seem an option to tackle this situation, something more is needed, like the adoption of AI technologies in agriculture.

Growth driven by IOT

Huge volumes of data get generated every day in both structured and unstructured format. These relate to data on historical weather pattern, soil reports, new research, rainfall, pest infestation, images from Drones and cameras and so on. Cognitive IOT solutions can sense all this data and provide strong insights to improve yield.

Automation techniques in irrigation and enabling farmers

In terms of human intensive processes in farming, irrigation is one such process. Machines trained on historical weather pattern, soil quality and kind of crops to be grown, can automate irrigation and increase overall yield. With close to 70% of the world's fresh water being used in irrigation, automation can help farmers better manage their water problems

Drone

Before the crop cycle, drone can be used to produce a 3-D field map of detailed terrain, drainage, soil viability and irrigation. Nitrogen-level management can also be done by drone solutions Aerial spraying of pods with seeds and plant nutrients into the soil provides necessary supplements for plants. Apart from that, Drones can be programmed to spray liquids by modulating distance from the ground depending on the terrain Crop Monitoring and Health assessment remains one of the most significant areas in agriculture to provide drone-based solutions in collaboration with Artificial Intelligence and computer vision technology. High-resolution cameras in drones collect precision field images which can be passed through convolution neural network to identify areas with weeds, which crops need water, plant stress level in mid- growth stage. In terms of infected plants, by scanning crops in both RGB and near-infra red light, it is possible to generate multispectral images using drone devices. With this, it is possible to specify which plants have been infected including their location in a vast field to apply remedies, instantly. The multi spectral images combinehyper spectral images with 3D scanning techniques to define the spatial information system that is used for acres of land. The temporal component provides the guidance for the entire lifecycle of the plant.

Precision Farming

The phrase "Right Place, Right Time, Right Product" sums up precision farming. This is a more accurate and controlled technique that replaces the repetitive and labor-intensive part of farming. It also provides guidance about crop rotation

© MAY 2026 | IRE Journals | Volume 9 Issue 11 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I11-1718423

Key technologies that enable precision farming are given below:

1.High precision positioning system Automated steering system
2.Geo mapping Sensor and remote sensing Integrated electronic communication Variable rate technology optimum planting and harvesting time, water management, nutrient management, pest attacks

Yield Management using AI

The emergence of new age technologies like Artificial Intelligence (AI), Cloud Machine Learning, Satellite Imagery and advanced analytics are creating an ecosystem for smart farming. Fusion of all this technology is enabling farmers achieve higher average yield and better price control. Technology can also be used to identify optimal sowing period, historic climate data, real time Moisture Adequacy Data (MAI) from daily rainfall and soil moisture to build predictability and provide inputs to farmers on ideal sowing time.

AI startups in Agriculture

1.Prospera founded in 2014. This Israeli startup has revolutionized the way farming is done. It has developed a cloud-based solution that aggregates all existing data that farmers have like soil/water sensors, aerial images and so on. It then combines it with an in-field device that makes sense of it all. The Prospera device which can be used in green houses or in the field, is powered by a variety of sensors and technologies like computer vision. The inputs from these sensors are used to find a correlation between different data labels and make predictions
2.Blue River technology, founded in 2011. This California-based startup combines artificial intelligence, computer vision and robotics to build next-generation agriculture equipment that reduces chemicals and saves costs. Computer vision identifies each individual plant, ML decides how to treat each individual plant and robotics enables the smart machines to take action.
3.FarmBot, founded in 2011. This company has taken precision farming to a different level by enabling environment conscious people with precision farming technology to grow crops at their own place. The product, FarmBot comes at a price of $4000 and helps the owner to do end-to-end farming all by himself. Ranging from seed plantation to weed detection and soil testing to watering of plants, everything is taken care of by this physical bot using an open-source software system

Challenges in AI Adoption in Agriculture

Though Artificial Intelligence offers vast opportunities for application in agriculture, there still exists a lack of familiarity with high tech machine learning solutions in farms across most parts of the world. Exposure of farming to external factors like weather conditions, soil conditions and presence of pests is quite a lot. So what might look like a good solution while planning during the start of harvesting, may not be an optimal one because of changes in external parameters AI systems also need a lot of data to train machines and to make precise predictions.

In case of vast agricultural land, though spatial data can be gathered easily, temporal data is hard to get. For example, most of the crop-specific data can be

obtained only once in a year when the crops are growing. Since the data infrastructure takes time to mature, it requires a significant amount of time to build a robust machine learning model. This is one reason why AI sees a lot of use in agronomic products such as seeds, fertilizer, pesticides and so on rather than in-field precision solutions.

REFERENCES

Print references

[1] Bhalla, A nature of Agriculture development in India, Jawaharlal Nehru University, New Delhi.

[2] Golait, Current Issues in Agriculture Credit in India: An Assessment, Reserve Bank of India Occasional Papers, Vol.28, Issue No.1, pp. 1-2, 2007.

Electronic references

World Wide Web

[3] https://www.techemergence.com/ai-agriculture-present-applications-impact/

[4] https://www.google.com/search?client=firefox-b&lei=LXQCXKqnDdbgrQG6rLeQCg&q=agriculture%20intelligence&ved=2ahUKEwiKq4CLx_7eAhUFA3IKHfXmDWgQsKwBKAR6BAgCEAU&biw=1366&bih=618

[5] https://www.techopedia.com/the-6-most-amazing-ai-advances-in-agriculture/2/33177