

# Ai In Agriculture:A Review

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**Abstract:** Artificial Intelligence in Agriculture is transforming the agriculture industry. It provides farmers by yielding healthier crops, control pests, and many more. Artificial Intelligence has been widely considered as one of the most viable solutions to improve crop production and real-time monitoring, harvesting, processing and marketing. Artificial Intelligence is making a revolution in agriculture by undeviating use to be an embodiment of a shift in the way that farming is exercised during the present time and helping the world to become a better future. As the world population is increasing due to which land water and resources becoming insufficient to continue the demand-supply chain and the agricultural domain faces countless obstacles for instance diseases which kills people, insufficient soil analysis, irrigation etc and a lot more. So we need to be smarter for a better future in agriculture. This paper emphasis the application of Artificial Intelligence in agriculture that describes the different domains of agricultural Sciences.

**Index Terms:** Artificial Intellegence, Applications of AI, Real time insights Domains for agricultural Sciences.

## I. INTRODUCTION

Agriculture plays a pivotal role in the economic province for each country. Population around the world is escalating, and so is the demand for food. The prevailing methods that are used by the farmers are inadequate to fulfil the need at the current circumstances. Hence, some new automation methods are established to satisfy these obligations and to provide great job opportunities to swarm people in this sector. AI has become one of the most indispensable technologies in every sector, inclusive of education, banking, robotics, agriculture, etc. In the agriculture sector, it is playing a very significant role, and it is revolutionizing the agriculture industry. AI put to one side the agriculture sector from distinct aspects such as climate change, population growth, employment issues in this field, and food safety. Today's agriculture system has captured at a different magnitude due to AI. Artificial Intelligence make better crop production and real-time monitoring, harvesting, processing and marketing. Divergent hi- tech computer-based systems are designed to decide various important criterions such as weed detection, yield detection, crop quality, and many more.

## II. AI TO IMPROVE FOOD AND AGRICULTURE

The technologies which are AI-based help to increase adeptness in all the fields and also manage the obstacles faced by numerous industries including the various fields in the agricultural sector like the crop yield, irrigation, monitoring, establishment, soil content sensing, weeding. Agricultural robots are customized to admired application of AI in the mentioned sector. With the global population increased rapidly, the agricultural sector is facing a dare, but AI has the prospective to deliver much-needed solution. AI- based technological solutions has allowed the farmers to produce more output with less input and even improved the quality of output, also make sure quick go-to- market for the yielded crops. By 2020, farmers will be using 75 million linked devices. By 2050, the average farm is look ahead to generate an average of 4.1 million data points every day

## III. HOW AI IS REVOLUTIONIZING INDIAN AGRICULTURE INDUSTRY

Indian Government, during 2020-21 and 2021-22, has associated funds to the tune of INR 1756.3 cores and INR 2422.7 crores to the States for make acquainted with new technologies. Artificial Intelligence and Machine Learning have rectified a number of industries this AI wave has hit the agriculture section in India as well. There are a number of technologies being yielded by companies to make monitoring of crop and the health of soil easier for farmers. Hyperspectral imaging and 3D laser scanning are two of the top technologies developed using AI that can help in take care of the crop health. The data to make available predictive analysis can be assembled through the in-field sensors etc. Using Artificial Intelligence to make enterprising and impactful decisions in the agriculture field can enable in overcoming different provocations. The technologies are contributing real-time analysis of the soil condition and whether it is in need of water and other substances or not. This real-time insights helps in decoding what the soil needs and how it can be kept in the favourable conditions. Using real-time analysis, these systems can minimize the human efforts stand in need of looking at the soil or land from time to time. Advanced and modern agriculture creators are make use of these systems to automate their irrigation. There are a number of automatic irrigation systems that aware the moisture content in soil and switch the submersible pumps on or off for keep in existence the moisture level. Human interference is get rid of through this system.

#### IV. HOW AI IS USED IN AGRICULTURE

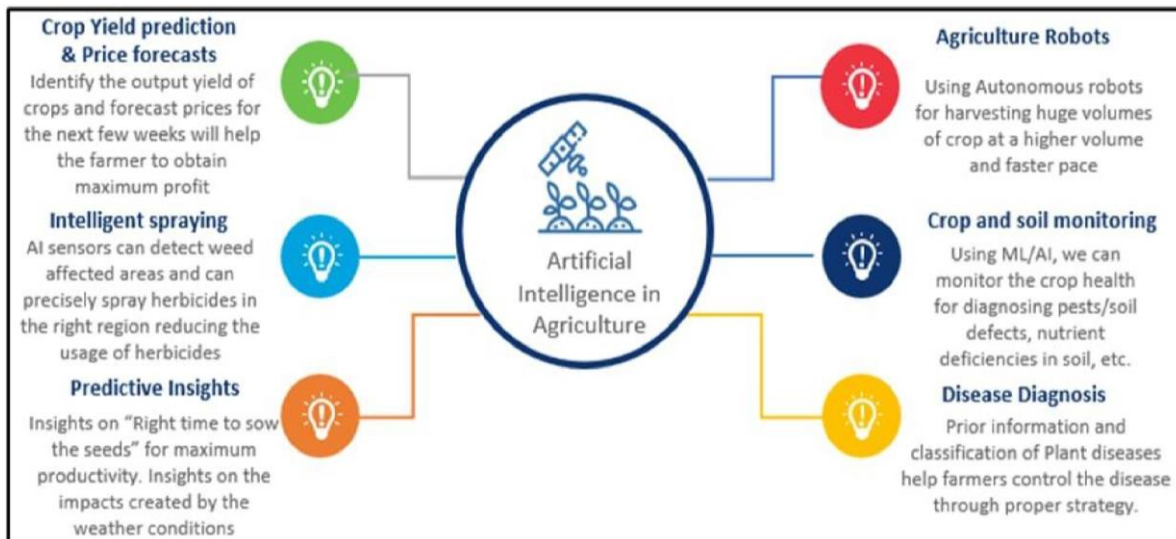


Fig .1

#### V. APPLICATIONS

1. **Weather & price Forecasting:** It is difficult for the farmers to take the right conclusion for harvesting, sowing seeds, and soil preparing due to climate change. But with the help of AI weather forecasting, farmers can have information on weather analysis, and accordingly, they can plan for the type of crop to grow, seeds to sow, and harvesting the crop. With price forecasting, farmers can get a better idea about the price of crops for the next few weeks, which can help them to get maximum profit.

2. **Health Monitoring of Crops:** The quality of crop widely pivot on the type of soil and nutrition of the soil. But with the developing rate of deforestation, the soil quality is humiliating day by day, and it is hard to determine it. To resolve this issue, AI has come up with a new application called Plantix. It was developed by PEAT to recognize the insufficiency in soil, including plant pests and diseases. With the help of this application, farmers can obtain an idea to use finer fertilizer which can make better the harvest quality. In this app, AI's image recognition technology is utilized by farmers which can catch the images of plants and get details about the quality.

3. **Agriculture Robotics:** Robotics is being widely used in different fields. Nowadays, different AI companies are burst out robots to be employed in the Agriculture province. These AI robots are developed in just like that they can perform various tasks in farming. AI robots are also coached in checking the quality of crops, detect and controlling weeds, and harvesting the crop with faster briskness compared to a human.

4. **Intelligent Spraying:** With AI sensors, weed can be perceive easily, and it also detects weed pretentious areas. On finding such areas, herbicides can be accurately sprayed to make less the use of herbicides and also retains time and crop. There are different AI companies that are putting up robots with AI and computer vision, which can specifically spray on weeds. The use of AI sprayers can extensively reduce the number of chemicals to be used on fields, and hence make better the quality of crops and also saves money.

5. **Disease Diagnosis:** With AI prognosis, farmers can get consciousness of diseases easily. With this, they can easily determine diseases with proper scheme and on time. It can rescue the life of plants and farmer's time. To do this, primarily, images of plants are initialized using computer vision technology. This watch over that plant images are perfectly divided into the diseased and nondiseased parts. After observation, the diseased part is cropped and get off to the labs for more extreme diagnosis. This technique also lend a hand to the detection of pests, insufficiency of nutrients, and many more.

6. **Precision Farming:** Precision farming is all about "Right place, Right Time, and Right products". The precision farming technique is a much precise and superintend way that can put back the labour - intensive part of farming to perform monotonous tasks. One example of Precision farming is the recognizing of stress levels in plants. This can be acquired using high-resolution images and various sensor data on plants. The data prevailed from sensors is then provisioned to a machine learning model as input for stress recognition.

#### VI. TOWARDS FUTURE FARMING

The time ahead of AI in agriculture will require a major address on universal ingress because most forefront technologies are only used on wide-reaching, well-connected farms. Increasing surpass and connectivity to homaloidal small farms in remote zones to the other side of the world will cement the future of machine learning automated agricultural products and data science in farming.

#### VII. CONCLUSION

It's eye-opening look at how artificial intelligence is clinching food assured for the future. AI can be pertinent and efficacious in agriculture sector as it amends the resource use and logicity and solves the paucity of resources and labor to a conspicuously. Artificial intelligence can be technological rebellion and boom in agriculture to provide for the enlarging amount of human population in the world

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