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# Study on Agriculture based AI Technologies

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***Abstract:*** ***Technology has redefined agriculture for years, and technological advances have influenced agricultural business in one or more ways. Agriculture is a major occupation in many countries around the world, and as the population grows, the United Nations predicts that it will increase to 9.7 billion by 2050, increasing the country's land by only 4%. Therefore, the pressure on the country will continue to increase. This means that farmers need to do more with less effort. According to the same survey, to feed another 2 billion people, food production needs to be increased by 60%. However, traditional methods are not sufficient to meet this enormous demand. This has led farmers and agricultural business to find new ways to increase production and reduce waste. Increasing populace in the long run ends in expanded farming results. At today`s date farming strategies are stronger the use of generation which include synthetic intelligence which ends up in stronger high-satisfactory of yield. This paper Raises an innovative idea like how to introduce the AI based technologies into the agriculture field for future generation.***

***Keywords: Agriculture, AI technologies, Population, Food production, Agricultural business.***

## I. INTRODUCTION

One of the fastest growing fields is AI. Bringing AI in agriculture will be helpful for the farmers in many aspects. Artificial intelligence is based on the principle that machines can easily imitate it and define human intelligence so that it can perform tasks from the simplest to the most complex like the visual recognition system for self-driving cars. AI is designed for simplicity and intelligence work. Artificial intelligence goals include learning, reasoning, and cognition. AI sensors helps farmers to analyse agricultural data by improving crop quality and accuracy. The main goal of this paper is to point out the challenges faced by farmers while using traditional farming methods and how it can be replaced by the AI efficient methods.

## II. APPLICATIONS OF AI IN AGRICULTURE

### *A. Plant Disease and Insect Detection*

The AI system uses satellite images and algorithms to compare it with the data like what all insects has landed on the crops such as locusts, grasshoppers, caterpillars etc. After the detection of insects needed precautions should be carried out by applying the pest control which helps the farmers to fight pests. Prognosis of crop pests and diseases can also be an advanced knowledge of imaging technology. This can be done using deep learning and image processing.




Fig.1 Sample picture [8]

### *B. Types Of AI Based Agricultural Drones*

1) *Use of Pesticides Decreased by AI Drones:* AI drones is also employed to control weeds, pests, etc. It collects information on weeds and examines the locations where they are prevalent using machine learning and computer vision. Farmers only spray pesticides where the weed is truly growing since, they are aware of that location. Through this method, pesticides are kept away from the actual crops, resulting in healthier harvests. Toxic substances known as pesticides injure not just individuals but also agriculture. The usage of pesticides can pollute the soil, the water, or any other vegetation. AI therefore cuts down on the usage of pesticides in agriculture. This can also lower the cost of pesticides, which could result in higher revenues for the farmers.[5] [3]

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2) *AI Drones to Monitor Crop Growth:* Agriculture is a large-scale activity in which it requires lot of man power and time to analyse the whole field. It is not an impossible job but still there could be lots of errors. AI based Drones can also do the same job in a few hours and perfectly. It is important to evaluate crop fitness and see bacterial or fungal infections on trees. These statistics can produce multispectral photos that adjusts in vegetation and imply their fitness. In addition, as quickly as an illness is discovered, farmers can follow and reveal treatments extra precisely. These opportunities boom a plant's cap potential to catch a disease. Infrared mapping allows drones to collect information about the health of both soil and crops. [5] [3]



Fig.2 Pictorial representation [5]

*C. AI For Weather Forecasting*

With the constant changes in climatic situation and growing pollutants it is tough for farmers to decide the proper time for sowing seed. This issue can be sorted out by AI technology. An app can be developed in order to predict the climatic conditions. The AI helps the farmers to know about the weather conditions in the beginning itself, which helps them to know the right time to sow the seeds [2]




Fig.3 Pictorial representation [2]

*D. Precision Farming and Predictive Analytics*

AI Technologies have evolved in a vast way that new apps could be created to help farmers, like, the farmers can get a notification on their mobile whenever there are caution for some pest attacks or when is the right time to sow the seeds. These types of predictive analytical apps could be developed with the help of AI. While the usage of the algorithms in reference to pixel captured with the aid of using satellites and drones, AI-enabled technology expects climate conditions, examine crop sustainability, and examine farms for the presence of illnesses or pests and bad plant vitamins on farms with records like temperature, precipitation, wind speed etc. [2]

## III. CHALLENGES FACED BY FARMERS OF INDIA

According to the survey of 2022, these are the challenges faced by the farmers;

1) Insufficient water supply
2) Less use of modern farming equipment
3) Over dependence on traditional crops
4) Poor storage facilities
5) High Interest Rates (debts)
6) Government good deeds fail to attain small farmers.[4]

## IV. FUTURE OF INDIAN AGRICULTURE

Future of agriculture is a completely vital query for the planners and all different stakeholders. Government and different businesses are looking to cope with the important thing demanding situations of agriculture in India. There is a need for cost-powerful technology with environmental safety and on preserving our herbal sources. The efforts are being completed to transform all the demanding situations in agriculture into possibilities. New technologies should be introduced to save our Indian agriculture. The above-mentioned existing AI technologies can be given to the farmers of India by the Indian government at a low cost. Then farmers should be taught the knowledge about the using of those. [4]

## V. APPLICATION OF DIGITAL AGRICULTURE

*1)* Artificial Intelligence/Machine Learning (AI/ML) algorithms can generate real-time actionable insights to assist enhance crop yield, manipulate pests, help in soil screening, offer actionable facts for farmers, and decrease their workload.

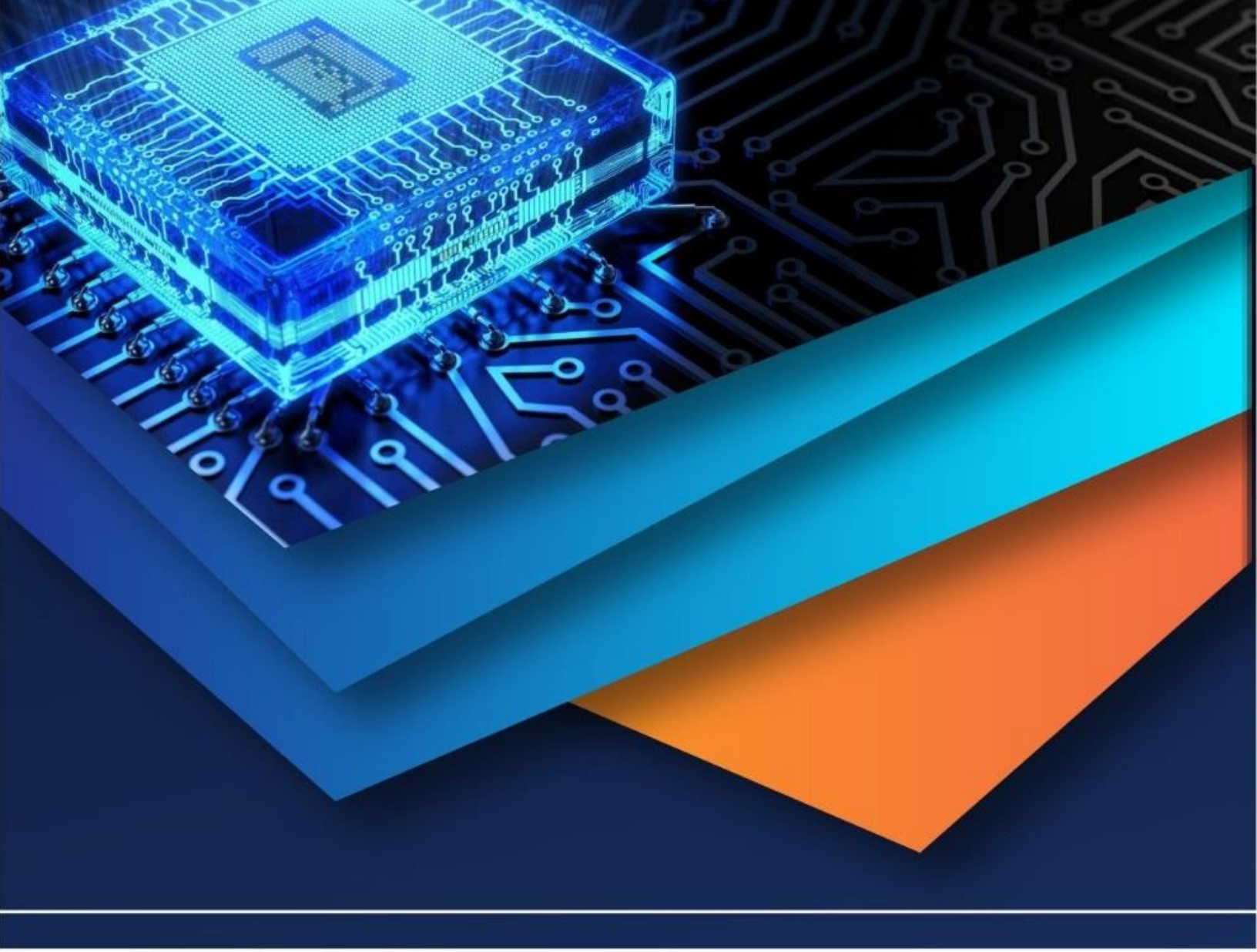
*2)* Blockchain era gives tamper-evidence and particular facts approximately farms, inventories, short and stable transactions, and meals tracking. Thus, farmers do not need to be depending on office work or documents to report and keep vital facts.

## VI. CONCLUSION

Through modern technologies especially AI Agriculture is being developed in a rapid way. With AI there is less manpower, reduced cost, advanced farming tools and so much more. In this digital world, Digital Agriculture is also possible. Digital Agriculture primarily based totally on AI can reduce farmers' pressure on crop production and their reliability withinside the face of unexpected inclinations in the weather forecast, and lowering labour costs. In this paper, several articles were reviewed and it modified into observed that going for walks productively with AI is possible in agricultural activities. The solutions given above were purely based on the challenges faced by Indian farmers as per the latest articles of the year 2022. We conclude that, the rising demand of food production and slow destruction of Indian agriculture could be saved by making use of the AI technologies.

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