

## Artificial Intelligence for Intelligent Agriculture

Jyoti Bala<sup>1</sup> and Jagriti Patel<sup>1</sup>

<sup>1</sup>Ph.D. Research Scholar, Department of Soil Science and Agricultural Chemistry, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.) 492012.

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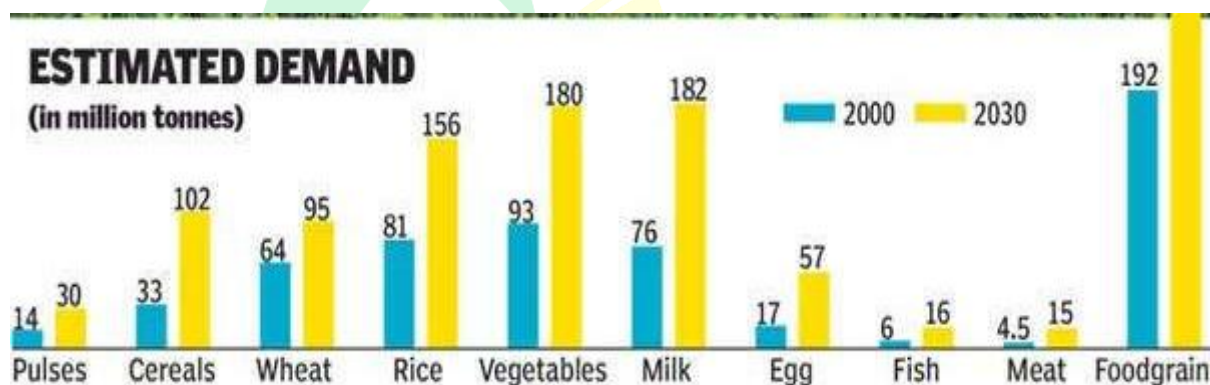
### Introduction

By 2050, the population is predicted to exceed nine billion, necessitating a 70% increase in agricultural output to meet the need. Land, water, and other resources are running out due to the growing world population, making it impossible to maintain the demand-supply cycle. Therefore, we must adopt a more strategic approach to farming in order to maximize the crop productivity. The future of food is unquestionably digital, and artificial intelligence (AI) is unavoidably the future of digital. Artificial intelligence is based on the idea that human intelligence can be described in a way that makes it simple for a machine to imitate it and carry out tasks of any complexity. Artificial intelligence has three main objectives: learning, reasoning, and perception. The term ‘artificial intelligence’ was first introduced by John McCarthy (1955). The best use of resources will be made possible by adopting AI technology, which will also make it easier to maintain crop health, perform predictive analysis, and improve quality and traceability. As the country recovers from the current COVID-19 crisis and rebuilds its economy, AI in agriculture could return the Kisan to his splendor.



### Why AI in agriculture?

Despite being one of the oldest professions, agriculture's importance has increased in light of the growing danger of food insecurity. Artificial intelligence-powered technology is ensuring the long-term viability of high-quality food production. Artificial intelligence (AI) tools are being used to identify pests, forecast the ideal time to plant, and estimate commodity pricing. Crops are being protected from wild animals by drones, hydroponics, artificial lighting, and cameras with AI. India contributes 18% to the world's global population, which is expected to succeed China by 2023. ICAR(Indian Council of Agricultural Research) has estimated that by 2030, the demand of cereals, pulses, eggs, fruits, vegetables and milk will double than it was in 2000 and the demand for foodgrains is expected to rise by greater than 85%.

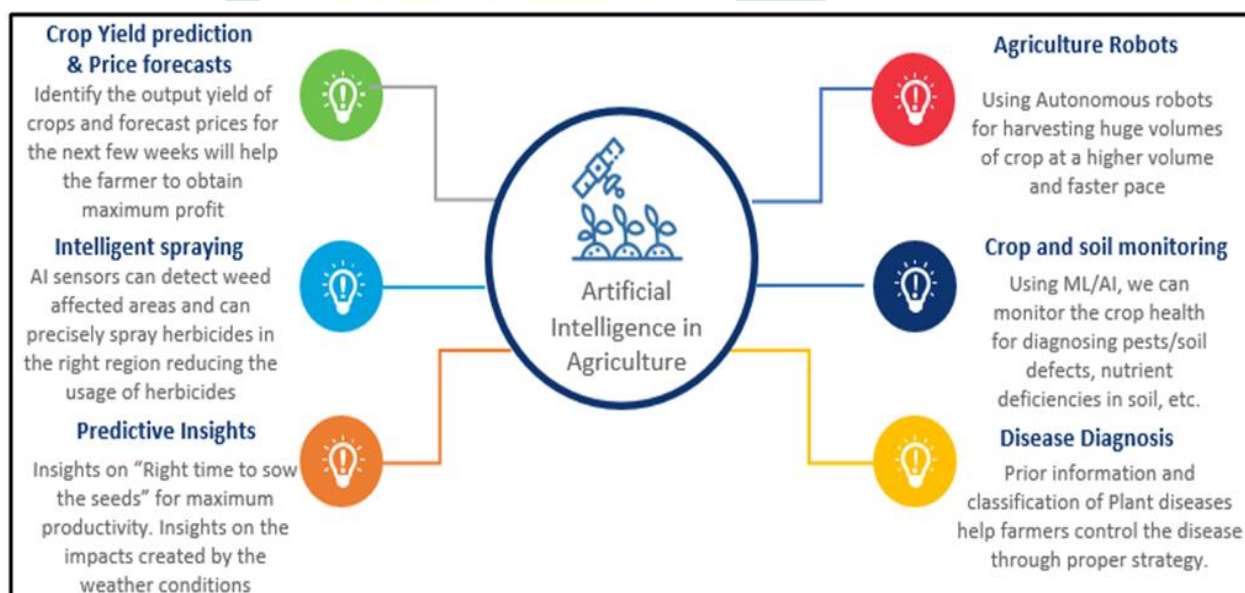


AGRI MATRIX	
<ul style="list-style-type: none"> <li>&gt; India assumes significant importance in terms of acreage of key foodgrains, but productivity is low</li> <li>&gt; Contribution percentage of key foodgrains in acreage terms is 15%, production contribution is 8.7%</li> <li>&gt; Rice &amp; maize yields are about one-half of the global yield</li> <li>&gt; There's scope for increasing productivity through technologies, but fragmented land among other things is a problem</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Average landholding size in India is about <b>1 hectare</b></li> <li>&gt; About <b>86%</b> farmers are small &amp; marginal who cultivate <b>47%</b> of India's arable land</li> <li>&gt; About <b>13%</b> are semi-medium farmers cultivating <b>43.6%</b> of the land</li> <li>&gt; About <b>0.9%</b> large farmers cultivate <b>9%</b> of the land</li> </ul>
Source: ICAR, PSA'S OFFICE, PwC, FICCI	

**Source:** (<https://timesofindia.indiatimes.com/times-special/sowing-the-ai-seed-for-intelligent-farming/articleshow/93261835.cms>)

### Use of AI in agriculture

1. AI will help in estimating the crop yields and forecasts in price, which will help farmers to get highest profits.
2. Sensors in AI can help in detecting the weed affected areas in field for spraying herbicides precisely and thus, preventing the over-exploitation or under-usage of herbicides.
3. It will help in predicting the right time of sowing for obtaining maximum productivity. This will help farmers reduce the hazardous impacts of weather and will contribute in doubling the farmer's income.
4. Robots driven by AI can help in harvesting larger volumes of the crop faster and they can be given training for crop specific variety, climate and location, while considering the byproducts for reducing the wastage.
5. AI and machine learning help in monitoring the health of crop, diagnosing pests and deficiencies of nutrients in the crops based on real time and prediction, thus helping the farmers to obtain higher crop production.
6. Solutions based on AI, given training on prior information and classification of plant diseases will help in controlling the diseases.



### Conclusion

With the help of artificial intelligence, farmers can automate their operations while also switching to precise agriculture for improved crop quality and production while utilizing



fewer resources. With information like temperature, precipitation, wind speed, and solar radiation, AI-enabled technologies forecast meteorological conditions, examine crop sustainability, and assess farms for the presence of diseases or pests and inadequate plant nutrition. Therefore, AI enabled technologies can help the farmers to handle the complexities of agriculture in an efficient way.

