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ARTIFICIAL INTELLIGENCE: APPLICATIONS IN AGRICULTURE

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INTRODUCTION

Artificial Intelligence (AI) is a branch of computer science that acts towards building of smart machines that have the capability of performing multiple functions which are usually done by humans because they require human intelligence.

By 2050, the population of our world will be around 10 billion, which will boost the agricultural demand in the range of 50% contrasted with 2013 (FAO, 2017). Introduction of various technologies like motorized equipment and biotechnology have improved the agriculture constantly. In agricultural sector like crop establishment, crop-monitoring, irrigation, soil content sensing, weeding and crop yield, AI-based technologies help to improve efficiency and manage the challenges faced by various industries in all the fields (Kim et al., 2008). By adopting AI technologies and following business trades, the agricultural industry is looking to maximize efficiency. The implementation of AI has been proved beneficial in the $5 trillion industries to grow healthier crops, decrease work load, arrange data and improve a wide range of tasks. Applications of AI help the farmers in the process of crop production, sowing operation, harvesting and marketing of produce. A judicious use of AI service can significantly boost agricultural productivity through recommendation engines, predictive analytics, computer vision and coupled with IOT devices.

6 MAIN BENEFITS OF AI IN AGRICULTURE:

I. **Growth driven by IOT**: Now-a-days huge volumes of data in both structured and unstructured format are generated by using IOT every day. These data reflect the prevailing weather pattern, soil conditions, new research, infestation of pest and disease, images from drones and cameras etc.

II. **Testing of soil**: Two technologies that stand for intelligent data fusion are proximity sensing and remote sensing. One of the use of this high resolution data is soil testing. While remote sensing requires sensors to be built into air borne or satellite systems, proximity sensing requires sensors in contact with soil or at a very close range.

III. **Insight generation based on images**: In-depth field analysis, crop monitoring & many other agriculture related things can be done by the help of the images that are being captured by using drones. This information can be merged with computer vision technology and IOT to make certain rapid actions by farmers.
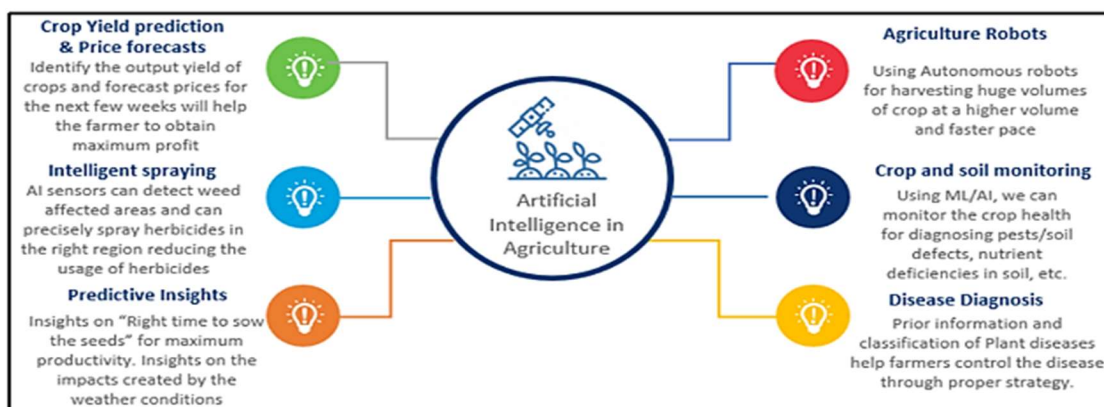
IV. Detecting crop diseases: Pre-processing of images makes sure that the leaf images are segmented into areas for farther diagnosis. Such a technique would identify pest more clearly. For plant growth monitoring and also for plant disease detection, various biosensors were established (Tothill, 2001).

V. Optimal mixture of agri-products: Different parameters viz. soil condition, weather, seed type, and location specific disease infestation help in making analytical assessment for recommending crops and seeds choice to farmers. Also some external factors like market place trends, prices or consumer needs can also be taking into consideration through AI.

VI. Crop health monitoring: Hyper-spectral imaging & 3D laser scanning along with remote sensing techniques are important to produce crop metrics across thousands of acres. Through this technology monitoring of crops can be done for their entire duration to generate reports, in case anomalies present. ER Hunt et al. (2005) evaluated Digital Photography from Model Aircraft for Remote Sensing of Crop Biomass and Nitrogen Status.

Three successful public-private partnerships in the field of digital farming:
1. AI- sowing app launched by Microsoft
2. Price forecasting model
3. Infosys precision crop management

CONCLUSION

The above mentioned examples of AI in agriculture sector clearly mark the preparedness of the Indian government to clear the way for social prosperity through digital farming in India. Although the enactment of AI in agriculture in India is still at genesis, they have been nailed as promising success stories.

- AI can be suitable in agriculture sector as it enhances the use and efficacy of resources available.
- The shortage of labour and resources can be solved substantially by the use of AI.
- AI can act as high-tech revolt and borne in agriculture to feed world's increasing human population.

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