ARTIFICIAL INTELLIGENCE IN AGRICULTURE

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Introduction

Artificial intelligence (AI) is the ability of a computer or a robot controlled by a computer to do tasks that are usually done by humans because they require human intelligence and discernment. Agriculture and farming are one of the oldest and most important professions in the world. It plays an important role in the economic sector. Worldwide, agriculture is a $5 trillion industry. The global population is expected more than nine billion by 2050 which requires an increase in agricultural production supply by 70% to cater the demand. As the world population is increasing due to which land, water and resources becoming insufficient to Cater the needs of growing population. So, we need a smarter approach which is more efficient in farm and can be most productive with the usage of existing resources. In this article, I will cover General challenges faced by farmers in farming and how Artificial Intelligence helps in making a significant revolution in agriculture.

GENARAL CHALLENGES FACED BY AGRICULTURAL SECTOR

In Agriculture climatic factors such as rainfall, temperature and humidity play an important role, Increasing Urbanization, Reduction in forest cover and increasing pollution results in climatic changes, so it's difficult for farmers to take decisions like soil preparation, sowing, water management, nutrient management and harvesting of produced crops .

Every crop requires specific Nutrients in the soil. There are 3 main nutrients Components like primary nutrients, secondary nutrients and micro nutrients. nitrogen(N), phosphorous(P) and potassium(K) Are primary nutrients and calcium, magnesium, Sulphur are secondary nutrients. The deficiency of these nutrients can lead to poor quality and quantity of crops.

In agriculture lifecycle weed protection plays an important role. If not controlled it can lead to an increase in production cost and also it absorbs nutrients from the soil which can cause nutrition deficiency in the soil.

APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN AGRICULTURE

The industry is turning to Artificial

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Intelligence technologies to yield healthier crops, control pests, monitor soil, and Water, organize data for farmers, help with the workload, and improve a wide range of agriculture-related tasks in the entire food supply chain the below are the major AI things we have to focus.

Use of weather forecasting: With the change in climatic condition and increasing pollution it's difficult for farmers to determine the right time for sowing seed, with help of Artificial Intelligence farmers can analyze weather conditions by using weather forecasting which helps they plan the type of crop can be grown and when should seeds be sown.

Soil and crop health monitoring system: The type of soil and nutrition of soil plays an important factor in the type of crop is grown and the quality of the crop. Due to increasing, deforestation soil quality is degrading and it's hard to determine the quality of the soil.

A German-based tech start-up PEAT has developed an AI-based application called Plantix that can identify the nutrient deficiencies in soil including plant pests and diseases by which farmers can also get an idea to use fertilizer which helps to improve harvest quality. This app uses image recognition-based technology. The farmer can capture images of plants using smartphones. We can also see soil

restoration techniques with tips and other solutions through short videos on this application.

Similarly, Trace Genomics is another machine learning-based company that helps farmers to do a soil analysis to farmers. Such type of app helps farmers to monitor soil and crop's health conditions and produce healthy crops with a higher level of productivity.

Analyzing crop health by drones: SkySqurrel Technologies has brought drone-based Ariel imaging solutions for monitoring crop health. In this technique, the drone captures data from fields and then data is transferred via a USB drive from the drone to a computer and analyzed by experts. This company uses algorithms to analyze the captured images and provide a detailed report containing the current health of the farm. It helps the farmer to identify pests and bacteria helping farmers to timely use of pest control and other methods to take required action

Precision Farming and Predictive Analytics: AI applications in agriculture have developed applications and tools which help farmer's inaccurate and controlled farming by providing them proper guidance to farmers about water management, crop rotation, timely harvesting, type of crop to be grown, optimum planting, pest attacks, nutrition management. Farmers without connectivity can get AI benefits right now, with tools as simple as an

SMS-enabled phone and the Sowing App. Meanwhile, farmers with Wi-Fi access can use AI applications to get a continually AI-customized plan for their lands. With such IoT- and AI-driven solutions, farmers can meet the world's needs for increased food sustainably growing production and revenues without depleting precious natural resources.

Agricultural Robotics: AI companies are developing robots that can easily perform multiple tasks in farming fields. This type of robot is trained to control weeds and harvest crops at a faster pace with higher volumes compared to humans. These types of robots are trained to check the quality of crops and detect weed with picking and packing of crops at the same time.

AI-enabled system to detect pests: Pests are one of the worst enemies of the farmers which damages crops. AI systems use satellite images and compare them with historical data using AI algorithms and detect that if any insect has landed and which type of insect has landed like the locust, grasshopper, etc. And send alerts to farmers to their smartphones so that farmers can take required precautions and use required pest control thus AI helps farmers to fight against pests.

Conclusion

Artificial Intelligence in agriculture not only helping farmers to automate their farming but also shifts to precise cultivation for higher crop yield and better quality while using available resources.

Companies involved in improving machine learning or Artificial Intelligence-based products or services like training data for agriculture, drone, and automated machine making will get technological advancement in the future will provide more useful applications to this sector helping the world deal with food production issues for the growing population.