

Indian Government Programs aimed at Integrating Artificial Intelligence into Agriculture

J. Kavipriya¹ and A. Vasuki²

¹Assistant professor (Agrl. Extension), ²Assistant professor (Agronomy), Krishna College of Agriculture and Technology, Usilampatti, Madurai

SUMMARY

Artificial Intelligence has become one of the most important technologies in every sector, including education, banking, robotics, agriculture, etc. AI saves the agriculture sector from different factors such as climate change, population growth, employment issues in this field, and food safety. Kisan -E-Mitra, PM-Kisan-e-KYC, AI Seedling App, Using AI in Precision Agriculture, AI For Agricultural Innovation (AI4AI), AI Based Crop Insurance (PMFBY) and Namo Drone Didi Scheme are some of the Indian government programs aimed at integrating AI into agriculture from the past decade. All of the Indian government's initiatives to apply artificial intelligence (AI) to agriculture will be covered in this article.

INTRODUCTION

In our country, Over fifty percent of the population still makes agriculture their primary source of income. Thus, neglecting agriculture and farmers in the course of development would not be able to achieve the entire development of our nation. In such a situation, the most recent technical developments and solutions to the farming industry's obstacles can be used to achieve more effective farming methods. Artificial Intelligence has become one of the most important technologies in every sector, including education, banking, robotics, agriculture, etc. AI saves the agriculture sector from different factors such as climate change, population growth, employment issues in this field, and food safety. Today's agriculture system has reached at a different level due to AI. Artificial Intelligence has improved crop production and real-time monitoring, harvesting, processing and marketing. This article will address all of the government of India's projects aimed at utilizing artificial intelligence (AI) in agriculture.

Kisan -E-Mitra:

In order to empower farmers through technology interventions, the Indian government created Kisan e-Mitra (AI Chatbot) - Farmers' digital aid to answer their questions in their native tongues. The farmers' current linguistic and technology limitations are being eliminated by Kisan e-Mitra. At launch, the Kisan-e Mitra AI Chatbot is accessible in the five languages- English, Hindi, Bangla, Tamil and Odiya.

PM-Kisan - e-KYC

The facial authentication-based e-KYC function of the PM-KISAN mobile app was created by the Indian government. This app is the first mobile application in any government benefit program to use face authentication-based e-KYC. You may get this user-friendly mobile app from the Google Playstore with ease. By simply scanning their face, it enables farmers to complete their e-KYC while seated at home, even in rural areas of the nation, without the need for an OTP or fingerprint. As a result, farmers are no longer required to attend the CSC for biometric-based e-KYC or to have their mobile device linked to their Aadhaar. The farmer can complete their e-KYC by downloading the smartphone app. They can also help a hundred other farmers with their e-KYC.

National AI Strategy

The Indian government made doubling farmers' income a national agenda item, giving supply chain perspectives in agriculture, market development, and productivity enhancement a lot of attention.

Crop Advisory App

Plantix, a deep learning tool created by Berlin-based agricultural tech startup PEAT, is said to be able to detect possible flaws and nutritional deficits in soil. In April 2020 PEAT acquired the Swiss-India Startup Salesbee. Photos are taken using the user's smartphone camera, the image recognition software finds potential flaws. After that, users are given advice, tactics, and other potential fixes for soil restoration. Plantix, collaborates with ICRISAT, CIMMYT and CABI

AI Sowing application

Farmers who are using the app receive sowing tips on the best day to seed. Microsoft and ICRISAT worked together to create an AI sowing app that uses Power BI and Machine Learning from Microsoft Cortana Intelligence Suite. The best thing is that farmers don't have to spend any money or install any sensors in their fields. A feature phone with text messaging capability was all they required. Essential information included in the recommendations included the best time to plant, when to apply fertilizer based on soil tests, how to apply farm yard waste, how to treat seeds, the ideal sowing depth, and more. A customized village advisory dashboard offered crucial information on the condition of the soil, suggested fertilizer, and seven-day weather predictions. Across all crops, the yield increase varied from 10% to 30%.

Using AI in Precision Agriculture

Together, IBM and NITI Aayog are created an AI-powered agricultural production forecast model that will give farmers real-time advice. In order to provide farmers with precise prescriptions, IBM's AI model for predictive insights will use data from remote sensing (ISRO), soil health cards, IMD's weather prediction and soil moisture/temperature, crop phenology, etc. to improve crop productivity, soil yield, control agricultural inputs, and early warning on pest/disease outbreak.

AI for Agricultural Innovation (AI4AI)

In the World Economic Forum's Centre for the Fourth Industrial Revolution, India launched the Artificial Intelligence for Agriculture Innovation (AI4AI) initiative in August 2020 with support from the Ministry of Agriculture, the National Institution for Transforming India (NITI) Aayog, the Ministry of Electronics and IT, and active collaboration with the Government of Telangana.

With agritech and data management, the "Saagu Baagu" project under AI4AI has doubled the incomes and yields of 7,000 Chilli farmers in Telangana. 'Saagu Baagu' benefits 500,000 farmers across five value chains, demonstrating AI's vast potential in agriculture.

AI-Based Crop Insurance

According to a top official who participated in the creation of Pradhan Mantri Fasal Bima Yojana (PMFBY), new regulations suggested that "To reduce delays in crop insurance claim settlements, introducing specialized agencies that can assess crop yield estimates at the panchayat level using satellites, remote sensing data, unmanned aerial vehicles, and artificial intelligence."

Drones and AI improve crop insurance in the agricultural industry

Drones can monitor crop health and growth, evaluate agricultural losses and damage, and enhance crop insurance services and products, to name a few advantages. Drones can assist farmers in identifying and resolving issues early on by gathering data on crop status, including plant height, leaf area, biomass, chlorophyll content, and yield potential. They can also identify symptoms of sickness, stress, or insect infestation and notify farmers to take corrective or preventive action. Drones can also deliver precise and timely information about the degree and origin of crop losses and damage. Farmers may find it easier and faster to file their claims as a result. Furthermore, based on the data they produce, drones can help insurers provide more flexible and tailored crop insurance products and services. All things considered, drones can lessen the possibility of crop losses and claims while assisting insurers in avoiding fraud and legal issues.

Digital Agriculture Mission (2021-2025)

The goal of the Digital Agriculture Mission is to serve as a platform for a number of different digital agriculture projects. Among them are the establishment of the Digital Public Infrastructure (DPI), the execution of the Digital General Crop Estimation Survey (DGCES), and the assistance of academic and research institutions, state governments, and the federal government with their IT efforts.

The plan is supported by two main pillars:

- **Agri-Stack Krishi**
- **Decision Assistance Platform.**

The purpose also encompasses "Soil Profile Mapping," which tries to facilitate farmer-centric digital services in order to deliver accurate and timely information to the agriculture industry.

With farmers as its main aim, the Digital Agriculture Mission focuses on grassroots implementation. The following are some of the mission's main advantages:

1. Digital authentication eliminates the requirement for paper records and in-person meetings in order to access services and benefits.
2. Accurate statistics on agricultural acreage and yield lead to increased efficiency and openness in government programs, crop insurance, and lending systems.
3. Creating and tracking crop maps to improve insurance claims and catastrophe response.
4. The creation of digital infrastructure to streamline value chains and offer specialized advice services for irrigation, pest control, crop planning, and health.

The Union Cabinet Committee, led by Prime Minister Narendra Modi, approved the 'Digital Agriculture Mission' on September 2, 2024, with a significant financial outlay of Rs. 2,817 Crore, including a share of Rs. 1,940 Crore from the central government, in order to transform the agriculture sector in a similar way.

NAMO Drone Didi Scheme

The Namu Drone Didi scheme aims to provide drones to 15,000 selected women SHGs during the period 2023-24 to 2025-2026 for providing rental services to farmers. Finance Minister Nirmala Sitharaman has allocated Rs. 500 crore for Namu Drone Didi scheme, an initiative aimed at providing drones to 15,000 selected women self-help groups (SHGs). She also announced support to one crore farmers for natural farming.. “In the next two years, 1 crore farmers across the country will be initiated into natural farming supported by certification and branding. Implementation will be through scientific institutions and willing gram panchayats. 10,000 need-based bio-input resource centres will be established.”

CONCLUSION

Farmers felt that drone technology is challenging to understand, despite their perception that drones are generally helpful for agricultural activities. In order to facilitate a better understanding of Artificial Intelligence, policy makers and researchers should think about planning capacity development programs that include awareness, training, and demonstrations. In addition, coordinated awareness-raising campaigns are desperately needed to encourage and support farmers in implementing agri-drones, providing they have access to institutional resources (money and policy).

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