Government Initiatives for ARTIFICIAL INTELLIGENCE IN AGRICULTURE

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Agriculture is crucial to long-term economic growth and structural transformation. It includes the production, distribution, marketing, and processing of agricultural and livestock goods. Agriculture and technology go hand in hand. The manner that exercises and land cultivation are done now is very different from how they were done a few decades ago because of technological advancements in the areas of metals, sensors, machines, and development.

advancement of knowledge. Modern agricultural technology includes robotics, sensors for temperature and moisture, aerial photography, and GPS advancements. These push-up devices, along with the precision of machinery and agriculture systems, allow organizations to grow stronger, more resilient, and even able to withstand attacks from above. Recent developments in ICT (information and communication technology) and related studies have shown that artificial intelligence is one of the most important technologies that could completely transform current agricultural methods. By combining the application, improved insights may be derived from field data with the use of artificial intelligence enabling farming methods to be planned methodically with the least amount of physical work. The present paper focuses on what all are the government initiatives to progress the adoption of Artificial Intelligence in agriculture in India.

Artificial intelligence (AI) techniques have been used by India's Ministry of Agriculture and Farmers Welfare to help farmers by addressing several issues in the agricultural industry. Below are a few of the initiatives:

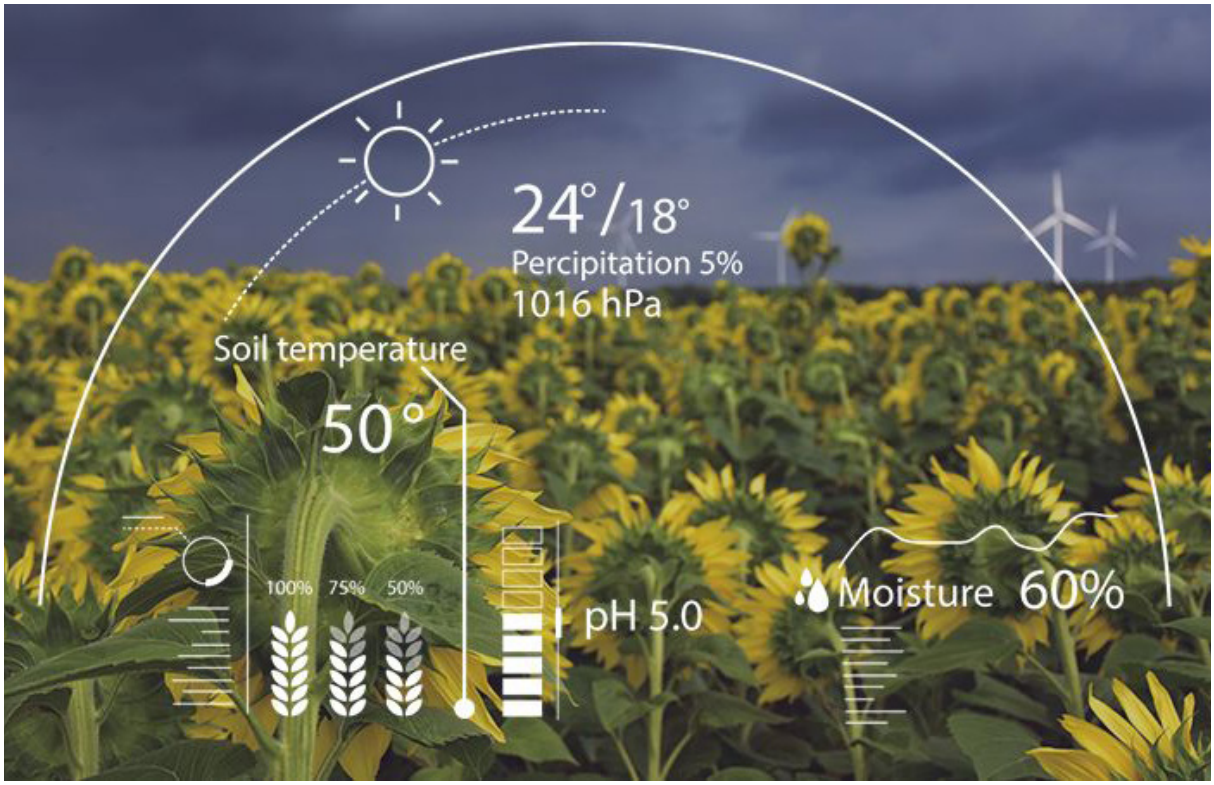
- ✓ AI-powered chatbot, "Kisan e-Mitra," can help farmers with questions regarding the PM Kisan Samman Nidhi program. This system is adapting to help with other government services and supports many languages.
- ✓ The National Pest Surveillance System to combat the loss of produce as a result of global warming. With the use of AI and machine learning, this system can identify crop problems and provide timely solutions for better crops.
- ✓ Artificial intelligence (AI)-based analytics employing field photos for crop health monitoring and assessment using satellite, weather, and soil moisture datasets for rice and wheat crops.

NATIONAL ARTIFICIAL INTELLIGENCE MISSION (NAIM)

The NAIM is an initiative launched by the Government of India to harness the power of artificial intelligence (AI) for economic growth and social development. The mission aims to position India as a global leader in AI research, development, and deployment across various sectors. Here are some key details about the National Artificial Intelligence Mission:

1. **Objective:** The primary objective of NAIM is to drive AI-led economic growth, improve the quality of life of citizens, and create a vibrant AI ecosystem in India. The mission focuses on developing and promoting AI technologies to address societal challenges and accelerate innovation in key sectors.

2. **Focus Areas:** NAIM focuses on key sectors such as healthcare, agriculture, education, smart cities, infrastructure, and transportation, among others. The mission aims to leverage AI technologies



to enhance efficiency, productivity, and service delivery in these sectors.

3. **Implementation:** The National Artificial Intelligence Mission is implemented by the Ministry of Electronics and Information Technology (MeitY) in coordination with other relevant government departments, research institutions, academia, industry stakeholders, and international partners. The mission involves collaboration with various stakeholders to drive AI research, innovation, and adoption in India.

4. **Key Initiatives:** Under NAIM, various initiatives are being undertaken to promote AI research, development, and deployment. These initiatives include setting up AI research centers, fostering industry-academia collaborations, supporting AI startups and innovators, developing AI skillsets, and creating AI applications for societal benefit.

5. **AI Innovation Hubs:** NAIM aims to establish AI Innovation Hubs across the country to p rovide a platform for collaboration, knowledge exchange, and capacity building in AI technologies. These hubs serve as centers of excellence for AI research, development, and deployment in different sectors.

6. **International Collaboration:** The National Artificial Intelligence Mission encourages collaboration with international partners, academic institutions, research organizations, and industry players to leverage global expertise, best practices, and resources in advancing AI technologies in India.

7. **Policy Framework:** NAIM also focuses on developing a comprehensive policy framework for AI governance, ethics, data privacy, and security to ensure responsible and sustainable use of AI technologies in India.

DOUBLING FARMERS' INCOME

The Indian government's goal of doubling farmers' income by 2022 involves a multi-faceted approach that includes the integration of various technologies, including artificial intelligence (AI), to enhance agricultural productivity, improve efficiency, reduce post-harvest losses, and ultimately increase farmers' incomes. Here are some key points regarding the role of AI in the government's initiative to double farmers' income by 2022

1. **Technology Integration:** AI can help optimize various aspects of farming such as crop planning, soil health management, pest and disease detection, precision agriculture, and market forecasting.
2. **Precision Agriculture:** AI-powered technologies enable precision agriculture practices that help farmers make data-driven decisions to optimize resource utilization, improve crop yields, and reduce input costs. By using AI algorithms to analyze data from drones, sensors, and other sources, farmers can gain insights to enhance their farming practices.
3. **Crop Monitoring and Management:** AI-based tools can assist farmers in monitoring crop health, identifying diseases, predicting yield, and recommending appropriate interventions. These technologies can help farmers take timely actions to protect their crops and maximize productivity.
4. **Market Intelligence:** AI can provide farmers with valuable market intelligence by analyzing data on market trends, prices, demand-supply dynamics, and consumer preferences. This information can help farmers make informed decisions about crop selection, pricing strategies, and market timing to maximize their income.
5. **Capacity Building:** To support the adoption of AI in agriculture, the government has been conducting training programs, workshops, and awareness campaigns to educate farmers about the benefits of AI technologies and how to effectively integrate them into their farming practices.
6. **Public-Private Partnerships:** The government has also encouraged collaborations between the public and private sectors to develop and deploy AI solutions tailored to the needs of farmers. These partnerships aim to leverage the expertise of technology companies, research institutions, and agricultural organizations to deliver innovative AI-based solutions to farmers.
7. **Monitoring and Evaluation:** Efforts are being made to monitor the impact of AI interventions on farmers' income levels and agricultural productivity. Data-driven assessments help in evaluating the effectiveness of AI technologies in achieving the goal of doubling farmers' income by 2022.

INDIA AI

AI-powered crop yield forecast model

In May 2018, NITI Aayog and IBM teamed up to create an AI-powered agricultural production forecast algorithm that will give farmers real-time advice. To raise farmers' incomes, the alliance seeks to offer insights into how to improve crop production and manage agricultural inputs. Creating a model for ten underprivileged areas in Assam, Bihar, Jharkhand, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh

would be the main goal of the project's first phase. This project's goal is to provide and make accessible climate-aware cognitive farming methods, crop monitoring systems, and early warning systems for pest and disease outbreaks based on cutting-edge AI advancements. In addition, it involves the use of mobile applications, IT, and comprehensive satellite weather advisory data, all aimed at increasing crop productivity and reducing costs via improved farm management.

Artificial Intelligence sensors for intelligent agriculture

In order to establish an ecosystem for artificial intelligence in farming, Microsoft, the technological partner, is collaborating with state governments, farmers, the Ministry of Agriculture and Farmers Welfare, the Ministry of Electronics and Information Technology (MeitY), and farmers. By collaborating with the engineering firm Escorts to leverage its cloud and artificial intelligence (AI) capabilities, Microsoft is facilitating precision agriculture capabilities and assisting farmers in making well-informed decisions. The AI-Sowing App, which is powered by Cortana Intelligence Suite and includes machine learning and Power BI, will be utilized by the program. Farmers who are using the app receive sowing tips on the best day to seed. Farmers only need phones that can receive text messages; they don't need to put any sensors in their fields or make any capital expenditures.

Drones to keep an eye on soil and crop health

Drones, which can smoothly scout across agricultural fields, are used in the project to collect exact data and send it in real time. Information Technology Research Academy (ITRA), Department of Electronics and Information Technology (DEITY), Ministry of Communication and Information Technology (MCIT), and Indian Council of Agricultural Research (ICAR) are to fund the "SENSAGRI: Sensor-based Smart Agriculture" project. In addition to providing advance notice, managing the aftermath of an incident, and allocating reimbursement under crop insurance plans, this capacity might be utilized to the advantage of the farming industry on a regional or local level to evaluate the health of the land and crops as well as the type, amount, and degree of damage. Advanced proof-of-concept services including yield and biomass, irrigation, tillage modification, and advanced crop maps are offered by SENSAGRI. Not only the drones cover a large region quickly, but they will also map and analyze it for a very small fee.

CONCLUSION

In emerging nations, policy attention is always focused on the adoption of innovative agricultural technologies. Farmers either do not accept new agricultural technologies—including machinery and management practices—or it takes a long time to start the adoption process and scaling up, even with the apparent benefits. The current study shows that to meet local requirements and demand, the people must make use of the government initiative AI technologies.