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Digital Farming: New Perspective in Agricultural Development

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Abstract : Digital farming combines farmers knowledge with new age technologies. It is the use of technology to improve crop quality and yields. It provides necessary resources, knowledge and skills for farmers to grow crops with proper management of natural resources. Technology has a major role in farming and agriculture practices and with the advent of digital technology, the scope has widened. The more digital farming is adapted the more precise farming can be, which helps to more efficient use of raw material.

Introduction - Agriculture is one of the major sectors in India that provide livelihood to a people. The majority of Indian population depends on agriculture as it is the major source of income. It is the oldest practice in the history of mankind. There has been tremendous growth and evolution in the field of agriculture.

Agriculture is important for more than just food production. It supplies raw materials to business including textiles, medicines and biofuels. Agriculture in India is largely dependent on nature, but climate and global warming issuemake farming unpredictable. The need of the hoursis to educate farmers in the use of modern technology and innovative approaches to increase productivity and raise profitability. Technology has a major role in farming and agriculture practices and with the advent of digital technology, the scope has widened. The use of modern technology has helped farmers to increase the production of crops and livestock.

The use of new technologies has also reduced the cost of production. The adaption of new technology has also led to the development of new methods of marketing and also created new jobs in agriculture sector. The present study deals with new technologies applied in farming sector. Availability of smart and digital apparatus make the farmer more aware with their job so that they can achieve their best in terms of production and also with environment conservation.

Digital Farming can help farmers by:

1. Improve crop yield and quality- By making more information about planting new varieties, fertigation, pest control.
2. Save time and money- By using resources more efficiently.
3. Conserve Inputs: By applying resources precisely.
4. Reduce waste: Precise application of resources.
5. Improve compliance: By ensuring compliance with food standards and nutrition tracking.

Principles of Digital farming: Principles of digital farming includes:

1. Precision farming: Providing crops and soil with the exact amount of water, nutrients and pesticides they need.
2. Robotics: Using autonomous tracks and drones to improve logistics and data collection.
3. Data- analysis: Using big data analysis and remote sensing to improve farm management.
4. Artificial Intelligent: To predict genetic outcomes and plant breeding innovations.
5. Internet of things: To connect farmers directly to consumers.

Emerging Techniques for Digital and Smart Farming:

Digital farming apps: These apps can help farmers make informed decisions in real time by providing a range of features. These include-

1. Agrimarket: It provides the market price of crops in markets within 50 km of the users lacation. It uses the users mobile GPS to automatically capture their location.
2. Agribegri: It is a farming market place app that advice farmers.
3. Pusa Krishi: This app provide information about technologies developed by the IARI (Indian Agriculture Research Institute).
4. Agrivi: This help agranians manage their enterprises by tracking field activities, controlling product quality and checking compliance with standards.
5. IFFCO Kissan App: It provides customized information to Indian farmers make more informed decisions.

6. De- Haat Farmer App: It is a one step platform that provides multiple services as frequent crop reminders, voice calls in regional languages, crop advisories, weather report, local mandi rates.
7. MP KISAN App: For farmers of MP, provides information on crop insurance claim calculation and future insurance premiums.
8. Agri setu: Knowledge and experience sharing platform for farmers, experts, suppliers and Buyers.
9. AgriCentral: A technology based app helps to make better decisions and increase profitability.

Apart from these Many more apps like Cropin Grow ,PM Kisan GOI,ICT 4 farmers , Ag Assist, My Cattle Manager , KISAN,Meghdoot, Mobi Agri, Boomitra Farmer ,Crop Survey,CIC Digital AgriHub, Digitalani Farmer ,Agriappare there which can serve for the betterment for Agriculture.

Soil Sensors: Nature of soil plays crucial role for farmers. By knowing the nature of soil farmer can enhance production and quality of products. Now a days various types of Soil Sensors are available by which one can know about Soil pH, Soil Temperature and humidity, Soil moisture etc.

Remote Sensing tools: Remote sensing tools are another add to help farmers. A small amount of wavelength from electromagnetic spectrum are used in remote sensors having application for agriculture purpose. The energy coming to plants in form of electromagnetic wave can be reflected, absorbed or transmitted by the plant. The reflection, absorption and transmission depends on the nature of plant and wavelength of energy. Remote sensing tools helps farmers in monitoring crop, monitoring water conditions, predicting weather condition, observing soil and air quality.

In addition to above tools devices like food sensors, Guidence and Tracing system, Variable rate input technology, Automatic section control, Automatic machinery and agriculture Robots, Drones can serve crucial role in farming digitalization.

By making use of new farming techniques farmer can achieve optimal crop development.

Digital Farming in Indian Context (Our Region): Digital agriculture has to be customized to be applicable to a typical Indian small farm if we want digital agriculture to be suitable and be available to a majority of Indian farms.Precise financial estimates of the cost of the technology per unit of land, per individual farmer and corresponding savings and return on investments are not available yet in Indian context. Thus, for digital agriculture to succeed in urban areas of India, the innovations must focus on low cast technology, easily portable hardware, policy renovations towards facilitating digital agriculture, renting and sharing platforms for agriculture equipment and machinery.In order to ensure its widespread adoption, the entire value chain will need to work together and come to an agreement on how to address these issues.

To promote digitization in agriculture, Digital agriculture Mission was launched in September 2024 by Govt. of India. In our area digital farming is steadily progressing with government actively promoting the use of technologies like GIS, remote sensing, digital platforms for market assessment and crop advisory services.

Some areas where progress is being made are pilot projects are implemented in certain districts to introduce precision farming practices, crop insurance registration is linked with land records and trainings to educate farmers on using digital tools and platforms. During interaction with farmers of Nimar and Malwa region it is found that the use of digital tools are not so common although they are using apps like *Damini*and social media platform.

Simultaneously some challenges, as not all farmers are comfortable using digital tools, and uneven internet connecting in rural areas, accurate data collection for local area are existing which require continued efforts and ensure equitable access to digital technologies for all farmers.

Conclusion: Digital agriculture is ICT and data ecosystem to support the development delivery of timely targeted information and services to make farming profitable, sustainable, delivery safe, nutrients and affordable food for all.Since farmlands varies in different areas a “one size fits all” management approach won’t work for every farmer. The digital transformation of agriculture has the potential to benefit all farmers independent of size. Not all digital tools benefit all farmers equally but they open the door for a more diverse offering of tailored solutions to bring the most possible benefit to each farmer and each field. As the agriculture is the foundation of civilization and stable economy. We can say that to get more precise farming it is needed to adopt more digital farming.

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