



CAIIB

Module-D Unit-2

Rural Banking



CAIIB Rural Banking Module D Unit 2-Role of Technology in Financial Inclusion and Rural Development

Modern Management Of Agriculture – Possible Technological Components

The components for modern management of agriculture can be **remote sensing, geographical information system, data analysis, artificial intelligence and machine learning and internet of things.**

Remote Sensing

- Remote sensing made use of visible, near infrared and shortwave infrared sensors to form images of the earth's surface by detecting the solar radiation reflected from targets on the ground.
- In case of crop cultivation, remote satellite or drone- based imagery can assist in crop classification. The image sensing systems can be used for estimation of acreage under cultivation, arriving at production estimates, evaluation of crop losses, spread of disease, if any, in any region, monitoring bio-diversity, assessment of the impact of agro-ecology, etc.

Geographical Information System

- This allows for multiple data of varied detail to be graphically depicted on a map and thus, providing visual and other indicators to ease associated decision making.
- GIS tools and analytics can accurately depict the collection of data on, crop acreage, production, crop health, disease and also maintain geo-database of farmers.

Big Data Analytics, Internet of Things (IoT), Block Chain and Artificial Intelligence:

- Big data analytics provide opportunity to systemize the large amount of widely dispersed data.
- Government agricultural development schemes and programs viz. AGMARKNET/e-NAM, Soil Health Card, National Animal Disease Reporting System (NADRS), Kisan Call Centre Database, DBT schemes and others, are already driving the need for adoption of Big Data Analytics in the agricultural sector.

Internet of Things in Agriculture

- The Internet of Things (coined by Kevin Ashton) is the interconnection via the internet of computing devices, embedded in everyday objects, enabling them to send and receive data.
- Various IT solution- provider companies/vendors have designed and supplied different platforms and software in the market for a digital solution to the

problems faced in agriculture/ agri-business for automation, resource-management, etc. for the benefit of farmers.

Artificial Intelligence:

- Artificial Intelligence (AI) takes automation to another level, by incorporating analysis and learning on the basis of past and current data. Farmers can benefit not only from the direct on-farm applications of AI, but also from its use in the development of improved seeds, crop protection, and fertility products.

Machine Learning Technique

- The use of ICT by way of interactive communication with farmers, also creates opportunity for AI powered chat-bots. These can use machine learning techniques, understand natural language and interact with users in a personalized way, giving advice and recommendations on specific farm problems.
- Public Extension service centres, Krishi Vigyan Kendras (KVKs) and Agricultural Technology Management Agencies (ATMA) are all well positioned to be the nerve centres for AI applications.

Blockchain technology for agricultural value system

- The blockchain is a ledger of accounts and transactions that are written and stored by all participants. it facilitates the use of data-driven technologies to make farming smarter.

Benefits Of Usage Of Technology In Agriculture

- The application of IoT technology in agriculture can bring a social change in the rural society in as much as the farmers can gain insight from data, develop plans and manage and execute these plans independently, as also undertake course correction and revise plans as required.
- Crop planning, crop scheduling, etc., can be done by them without depending on the extension machinery of the state. It is possible from them to take better on-farm decisions such as the optimal time to plant, irrigate, protect or harvest their crops.
- With the increase in productivity and income there will be increase in GDP in agriculture.
- The state/ nation-wide monitoring can be possible by time series, and spatial data analysis and taking measures and such measures would facilitate ground water conservation, lowering of carbon footprint due to reduced energy consumption and prevention of fertilizer run off and soil erosion.

Progress of IOT In Indian Agriculture

- Satellite derived seasonal cropping pattern, experiments on yield estimation, estimation of net-sown crop area and agricultural drought assessment studies are conducted by **National Remote Sensing Centre of the Indian Space Research Organization.**

- **The Information Technology Research Academy (ITRA), Hyderabad** set up by the Ministry of Electronics and Information Technology, in consultation with the Indian Council of Agricultural Research (ICAR), had identified various areas for research purpose in respect of robotics, sensors, interpretation and use of sensor data.
- **The Indian Agriculture Research Institute (IARI) has formulated a collaborative research project entitled “SENSAGRI – Sensor based Smart Agriculture”** - to develop indigenous prototype for Drone based crop and soil health monitoring system using Hyperspectral Remote Sensing (HRS) sensors, so as to be integrated with satellite-based technologies for large scale applications.
- Government is contemplating to position two of the important Public Extension Service Centres, viz Krishi Vigyan Kendras (KVKs) and Agricultural Technology Management Agencies (ATMA) in a big way for AI applications and for knowledge diffusion among India’s vast farming community.
- The Department of Agriculture, Cooperation and Farmers’ Welfare (DAC&FW) has already conceived proposal which envisaged that the information generated from Sensors could be provided on the phone of farmers as SMS or via mobile apps pre-loaded on their phone, and the collected data may be used for Big Data Analysis so as to create suitable Policies and Decision Support System (DSS).
- Farmers are provided all the relevant information relating to soil, crop and weather through web sites / portals as also through phones/app/mobiles through **Kisan Call Centre – 18001801551**.
- **National e-Governance Plan – Agriculture (NeGP-A):** It aimed at bridging gap in communication by using technology. It provides an integrated approach to the delivery of services to the farming community, using ICT. Under NeGP-A, around 60 online services have been developed over the last few years and launched to provide ease of access and timely information to farmers.
- GOI launched the **Digital India Land Record Modernization Program** with a view to minimizing the scope of land or property disputes and to enhance transparency in land records.
- Infosys, Tata Consultancy Services, SkyMet and Indian Space Research Organization are in a partner ecosystem with Azure FarmBeats of Microsoft, enabling a rich ecosystem of agriculture technology, sensors, and data providers.
- The **SmartFarming4AP** was developed by the Government of Andhra Pradesh in partnership with Bill & Melinda Gates Foundation and Dalberg Advisors to solve some of the most pressing challenges faced by small and marginal farmers in the state.
- SatSure, a data analytics company has integrated satellite imagery, weather and big data/ IoT analytics with the agriculture sector to help farmers with financial security and crop insurance. Radio Monsoon (started by five researchers) aims to ensure safety among fishermen in south India.

Other Initiatives For Development Of Rural Areas

- GOI launched the **Digital India Land Record Modernization Program** with a view to minimizing the scope of land or property disputes and to enhance transparency in land records. With the digitization of land records and providing the facility to the banks for creating online charge can address many issues relating to agricultural credit. It can also help in reducing the instances of multiple or double financing on the same piece of land. This will also facilitate easy access to land records for extending hassle-free loans to farmers and in time.
- In April, 2020, a central sector scheme called **Survey of Villages and Mapping with Improved Technology in Village Areas (SVAMITVA)** was launched to promote a socio-economically empowered and self-reliant rural India by the Ministry of Panchayati Raj.
- In terms of the guidelines of the scheme, the Revenue Department/ Land Records Department will be the nodal department at the state level for carrying out the scheme with the support of State Panchayati Raj Department. The Survey of India shall work as the technology partner.
- The Scheme aims to provide an integrated property validation solution for rural India. The demarcation of rural abadi areas will be done using drone surveying technology. This will provide 'record of rights' to village household owners possessing houses in inhabited rural areas in villages which, in turn, will enable them to use their property as a financial asset for taking loans and other financial benefits from banks.

Financial Technology In Financial Inclusion Space

NABARD which is maintaining the Financial Inclusion Fund has taken a series of initiatives for leveraging technology in the Financial Inclusion landscape for furthering financial inclusion in the rural areas.

- **Migration to CBS:** The CBS platform is essential for providing digital banking services to remote rural areas. While commercial banks have adopted CBS on their own, NABARD has supported the weak RRBs and Rural Cooperative Banks (RCBs) to implement CBS.
- **Facilitating DBT:** The NABARD-initiated CBS project in RCBs, apart from improving productivity within their organizations, has also helped them to credit DBT seamlessly into the accounts of their customers.
- **Enabling technologies and initiatives:** NABARD supported the integration of CBS with CBS plus services, such as ATM, micro-ATM and Atal Pension Yojana.
- **The Bank Sakhi model,** which coopts the SHG members as BCAs of the banks was pioneered by NABARD in order to provide time-flexible, acceptable, trustworthy and dependable BC services.
- **Payment Acceptance Infrastructure:** To cover all the farmers with RuPay Kisan Credit (RKC) on mission mode for full coverage of KCC accounts, RRBs and RCBs were supported for Europay, Master Card, Visa (EMV) chip based RKC. Besides

support to BCs/Bank Sakhis and branches for banking transactions, merchant channel transactions are also supported through the deployment of Pos/mPoS terminals in one lakh villages in Tier 3 to Tier 6 centres.

- **Onboarding for regulatory requirements:** Support extended to rural banks for meeting regulatory requirements such as C-KYC and Aadhaar User Agency or KYC User Agency. Further StCBs and RRBs have been supported for the opening of Aadhaar Enrollment and Update Centres so that they can provide Aadhaar related services to the people.
- **Connectivity for banking transactions:** To solve the issues of poor telecom connectivity and non-availability of continuous power in remote areas, support for solar power VSATs, etc. was provided for fixed customer service points in Sub Service Areas.
- **Digitizing Self- Help Groups:** With a view to creating a digital ecosystem to provide an end to-end solution to the Self-Help Groups-Bank Linkage Program to help standardize books of accounts and bring transparency and regularity in operation NABARD has launched e-Shakti project. Under this initiative 12.3 lakh SHGs were onboarded covering 140.9 lakh members spread over 1.7 lakh villages.
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