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Transforming Extension Services through Mobile Apps, ICTs, and Social Media

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The rapid growth of information and communication technologies (ICTs) has significantly transformed agricultural extension by improving service delivery, access, and impact. This section examines innovative methods in extension, emphasizing the use of mobile apps, digital tools, and social media. Mobile platforms now provide real-time updates on farming practices, weather, markets, and pest control. Tools like SMS, IVRS, and online systems have extended outreach, especially in remote areas. Social media promotes peer learning and interaction among stakeholders. The discussion includes case studies, highlights benefits, and addresses challenges like infrastructure, digital literacy, and localized content, urging integrated and policy-driven solutions.

Keyword- Agricultural extension, Mobile apps, ICTs, social media, Knowledge dissemination

Introduction

Agricultural extension is crucial for bridging the gap between research institutions and farmers by providing timely, practical knowledge to enhance productivity. Traditionally, it relied on face-to-face interactions, field demonstrations, and printed materials. While effective, these approaches often face limitations in scale, accessibility, and speed. In the context of evolving challenges like climate change, market fluctuations, and the need for sustainable practices, digital technologies have emerged as transformative tools. Information and Communication Technologies (ICTs) such as mobile apps, SMS alerts, and social media are now enabling real-time, personalized advisory services, even in remote areas. This article explores how digital innovations are reshaping agricultural extension, improving information dissemination, encouraging farmer participation, and addressing critical gaps in rural outreach and service delivery.

Types of Mobile Applications for Farmers

a. Pest Monitoring Mobile Applications: In modern farming, effective pest management is vital for protecting yields and ensuring sustainability. Digital tools like mobile-based Early Warning Systems (EWS) provide real-time data on pest levels, enabling timely and accurate control actions. These systems also support natural pest control by encouraging beneficial insects and improving habitats. For instance, EWS data from late 2019 to early 2020 showed stable activity and detected rising pests like bagworms. Based on Integrated Pest Management (IPM), interventions are advised only when pest levels near economic thresholds, prioritizing eco-friendly methods and minimizing chemical use.

b. Soil Health Card (SHC) Mobile Application: The Soil Health Card (SHC) initiative, under the Soil Health and Fertility project and RADP, aims to improve soil quality and productivity through sustainable practices and technology like GPS and remote sensing. Expanded during the 12th Five-Year Plan, it introduced upgraded soil labs and the Nutrient-Based Subsidy for balanced fertilization. State programs like Bhoochetana and Krishi

Mahotsav supported this effort. The SHC Mobile App offers GPS-based, customized fertilizer guidance, enabling farmers to make informed soil management decisions.

c. Pusa Krishi Mobile Application: Pusa Krishi, developed by the Ministry of Agriculture & Farmers' Welfare, is a key platform for agricultural innovation and the nodal agency for the RKVY-RAFTAAR agribusiness incubation scheme. It shares ICAR-developed crop varieties, advanced farming practices, and modern machinery use. The Pusa Krishi app delivers this knowledge directly to farmers, offering weather updates, cultivation techniques, and equipment guidance. It also supports two-way communication with experts, allowing farmers to share feedback and queries. By connecting scientific research with field-level practices, the app promotes sustainable and inclusive agricultural growth.

d. Kisan Suvidha App: Kisan Suvidha is a user-friendly mobile app designed to provide farmers with quick access to essential information. It offers weather forecasts, market prices, farm advisories, plant protection tips, and IPM strategies. The app also alerts users to extreme weather and real-time commodity rates at various levels. These features help farmers plan better, manage risks, and boost productivity and profits.

e. Kisaan Market App: Kisaan Market is a digital platform that connects farmers directly with buyers, cutting out middlemen and reducing costs like brokerage and transport. It provides real-time Mandi prices, weather updates, personalized tips, and localized news. The app also alerts users about government schemes and allows customization in language and market preferences, promoting knowledge-sharing and community collaboration among farmers.

f. IFFCO Kisan App: The IFFCO Kisan app is a farmer-focused digital tool offering services like Mandi prices, weather forecasts, crop advice, and expert guidance on horticulture and livestock. It also functions as a marketplace, linking buyers and sellers. Supporting 11 Indian languages and both text and audio formats, it ensures accessibility for farmers of all literacy levels, helping them make informed decisions and adopt modern practices.

h. Pashu Poshan App: The Pashu Poshan app, developed by NDDDB, offers scientific feed recommendations for cattle and buffaloes based on age, milk yield, and diet. Farmers can customize feed using local ingredients, lowering costs and improving nutrition. This enhances animal health, boosts milk production, and increases income, promoting sustainable dairy farming across India.

Initiative Name	Technology Used	Launch Year	Description
Kisan Call Centers (KCCs)	IVR, Voice Calls	2004	Farmers call toll-free numbers to receive immediate expert advice on agricultural queries.
mKisan Portal	SMS, Voice Messages	2013	A platform for sending advisories and alerts to registered farmers via SMS and voice messages in their local languages.
Kisan Suvidha App	Mobile App	2016	Provides information on weather, market prices, plant protection, input dealers, and expert advisories.
eNAM (Electronic Agriculture Market)	National Mobile App, Web Platform	2016	A pan-India electronic trading portal linking Agricultural Produce Market Committees (APMCs) across states.
AgriMarket Mobile App	Mobile App	2015	Offers information about current market prices of crops in the nearest markets.
Pusa Krishi App	Mobile App	2016	Provides farmers with agricultural advice, new varieties of crops developed by ICAR, and technologies for better farming.
Crop Insurance Mobile App	Mobile App	2016	Helps farmers manage their crop insurance needs, including policy status and information on insured crops and areas.
Agricultural Advisory Services through WhatsApp	WhatsApp Groups	2018	Utilizes WhatsApp for advisory services, real-time Q&A, and sharing updates on agricultural practices.
Digital Green	Videos, Social Media	2008	Uses videos and social media platforms to educate farmers about improved agricultural techniques and practices.
SHC (Soil Health Card) Scheme	Mobile App, Web Portal	2015	Provides farmers with soil health cards for monitoring the health of soil and getting tailored recommendations.
Agro Advisory Services by ICAR	SMS, Mobile App, IVR	2007	Offers weather-based and crop-specific advisories through various mobile technologies.
Farmers' Portal	Web Portal, Mobile Accessible	2013	A one-stop shop for all agricultural services, providing information on various government schemes and agricultural data.

Source: Ananda *et al.*

Case Study

In-Depth Analysis of a Successful Digital Initiative

e-Choupal: The e-Choupal initiative by ITC Ltd, launched in the early 2000s, set up internet-enabled kiosks in remote villages to provide farmers with direct access to vital agricultural information. These kiosks offered updates on weather, market prices, and best farming practices, helping farmers make informed decisions on crop selection, input use, and marketing strategies.

Future Aspects

The future of agricultural extension lies in digital tools powered by AI, IoT, and remote sensing, offering personalized, location-based advice. Social media and ICT will enable virtual training, market access, and financial services. Success depends on strong infrastructure, partnerships, and a hybrid model combining digital and traditional methods for inclusive, farmer-centric support. Interactive apps will simplify complex farm decisions through voice support and offline features. Youth and women will play a larger role as digital extension leaders. Continuous capacity building will ensure technology adoption at the grassroots level.

Conclusion

The integration of mobile apps, ICT tools, and social media has transformed agricultural extension by making information more accessible, timely, and interactive. Farmers now receive real-time updates, expert guidance, and market connections with greater ease. Despite these benefits, challenges like digital literacy, infrastructure, language barriers, and content relevance persist. A supportive ecosystem—built on inclusive policies, capacity building, and public-private collaboration—is crucial. Combining traditional and digital methods offers the most effective approach. These technologies are not just tools but key drivers of a smarter, more connected farming future.

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