

Review Article

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Mobile Applications for Indian Agriculture and Allied Sector: An Extended Arm for Farmers

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ABSTRACT

In India poor market infrastructure, inadequate marketing experience and agricultural inputs are available for the farmers. These farmers need to access information about new technologies before they can consider adopting them and thus they look up to research and extension agents as sources of new technologies. Access to appropriate information and knowledge is an important factor for successful agricultural production. However, now the traditional approach of providing agricultural information through extension services is overstretched and under-resourced. Accurate and timely market information can significantly reduce transaction and travel costs. Nowadays, the mobile apps have opened a new door for the farmers to get the information about crops, marketing and weather. Through this technology farmers directly keep in touch with market personals and can offer their produce with reasonable prices. The use of mobile apps also keeps them aware for weather forecast for agriculture input application like fertilizer and pesticides which might be affected by unforeseen weather disasters. Through mobile apps they were getting agricultural and allied information on time. Many apps are being utilized for different kind of functionality regarding the farming activities like cropping information, pesticides, fertilizer, seed, selling of crop, irrigation information, estimation of crop production, weather information, information regarding the best practices of farming, new technologies, dealers and market price.

Keywords

Mobile Communication, Agri apps, Mobile apps, Usage of Agri apps, Benefits of mobile apps

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Introduction

Agriculture is the primary source of income of the larger part of Indian population. The challenging task for farmers is information management mainly in terms of the amount of

data and the complexity of processes in precision farming. Agriculture in India is growing with the introduction of Green Revolution, White Revolution, Golden Revolution and Horticulture Revolutions. Agriculture experts have brought smart

farming technologies that enabled them to reduce costs, maximize yields and increase profits; and there is no better example of smart farming than with the 'mobile app'. The use of Information and Communication Technology (ICT) to support the transmission of localized information and services working towards making farming socially, economically and environmentally sustainable, while contributing to the delivery of nutritious and economical food for all – this comprises the Digital Agriculture. Rural India is drastically moving towards digitalization and technology these days. As per reports of 'The Rising Connected Consumer in Rural India', a study by the Boston Consulting Group, this share of rural India will jump to 48% by 2020. Digital India, launched in 2015 by Indian Prime Minister Narendra Modi which aims towards the promotion of digital literacy and creation of digital infrastructure, is apparently helping Rural India to gain this success of the farming community. Moreover, while 58% of Indian households still depend on Agriculture as their most eminent source of livelihood, it's time to give more focus on Digital Agriculture for a growing and prosperous India. Farming apps are the most convenient and useful medium to guide farmers in farming. It gives you the guideline for doing the proper scientific way of farming, crop cultivation, sowing or harvesting of any crop or vegetables. Farmers can easily solve their farming problems related to pest or insect attack or any problems which put them in a difficult situation. A farming app can be the best friend of farmers in farming which can enhance their productivity without spending a single amount of money. You can easily download it from your Google play store without paying a single rupee. This digital change is acting as a game-changer for Indian agricultural conditions. Thus, the apps are helping boost overall business performance and reducing negative environmental impacts of farming. Now, with a click of a button, farmers can access

information regarding weather, dealers, market prices, plant protection, agro advisories, IPM practices etc. Thus, these advancements will definitely help bring significant change in the lives of farmers and the field of agriculture.

Advantages of mobile applications

The inevitable and increasing importance of mobility in agriculture offers various advantages. All types of information on crops, soil, weather, climate, rainfall, seeds, animals and machinery at any point in time, and any number of times is available on finger tips of farmers (World Bank 2012). The information available is localized, thereby increasing the comfort and precision as required. This information is updated on regular basis and delivered via various applications that the farmer need not worry about getting the information from other sources. The farmer does not have to waste time while retrieving and referring because the available information is compiled and very well organized (Kirk *et al.*, 2011). The market connectivity is also improving with the visibility and knowledge of the potential buyers and sellers in the locality with an opportunity to develop direct contacts. The commodity prices can be delivered in a real time mode. Mobility can assist the farmers in better warehousing facility by updating their stock, track the dead stock, make note of the purchase requirements and thereby honouring the delivery commitments in a timely manner and getting the stock reach the end consumer and at the same time ensuring quality (Kuek *et al.*, 2011). Further this is beneficial in buying and selling of goods locally. The farmers can be well updated about their investments, track orders made on purchases, view bank statements, be well informed of insurance details and deadlines and thereby they can plan the production effectively (Baumuller 2012) (Table 1).

Table.1

App name	Developed by	Description
Kisan Suvidha	Ministry of Agriculture and Farmers Welfare, Govt. of India	Kisan Suvidha is a mobile app developed to help farmers by providing relevant information to the farmers on weather, market prices, dealers, plant protection, IPM practices, seeds, expert advisory, godowns and cold storages. The information is provided in English, Hindi, Odia, Tamil, Marathi and Gujarati.
Pusa Krishi	Ministry of Agriculture and Farmers Welfare, Govt. of India	This app provides information related to new varieties of crops developed by the Indian Council of Agricultural Research (ICAR). It also provides information to the farmers on resource conserving cultivation practices, farm machinery and its implementation and production technologies. A feedback section enables farmers to have a real time conversation with the stakeholders.
Soil Health Card (SHC) Mobile App	Ministry of Agriculture and Farmers Welfare, Govt. of India	Soil Health Card App gives soil nutrient status to each farmer for his/her land holding and also gives advice on fertilizer dosage needed to maintain soil health in the long run. This will also help to take corrective measures on the soil nutrient deficiencies identified in soil health cards. This application also captures Latitude and Longitude automatically when “Location” is on.
Crop Cutting Experiments Agri Mobile App	Ministry of Agriculture and Farmers Welfare, Govt. of India	This app is for capturing crop cutting experiment data and works in both online and offline mode. Internet is required only to download the app and for registration. After registration Crop Cutting Experiment (CCE) data can be entered using this app without internet connection and when internet connectivity is available, data can be pushed to the server.
Bhuvan Hailstorm App	Ministry of Agriculture and Farmers Welfare, Govt. of India	This mobile app has been developed to capture crop loss which has happened due to hailstorm, along with photographs and geographical locations. Agriculture Officer would go to the field with a mobile or tablet loaded with this mobile app and can collect field data.
IFFCO Kisan	Indian Farmers’ Fertilizer Cooperative Ltd.	This app enables access to various modules including agricultural advisory in the form of text, images, audio and videos in the selected language. The app also offers helpline numbers to get in touch with Kisan Call Centre Services. The

		app supports eleven languages across India including English.
Crop Insurance	Ministry of Agriculture and Farmers Welfare, Govt. of India	Crop Insurance mobile app can be used to calculate the Insurance Premium for notified crops based on area, coverage amount and loan amount in case of loanee farmer. It can also be used to get details of the normal sum insured, extended sum insured, premium details and subsidy information of any notified crop in any area.
Krishi Video Advice mobile app	MANAGE with NIC, Hyderabad	Krishi Video Advice mobile app has been conceptualized to bridge the information gap between the farmer and the expert. This mobile app works on all smartphones or tabs having android operating system. By using the mobile app any farmer or extension officer can capture three images of the crop live from the farmer's field itself and upload the same. Then the Kisan Call center (KCC) expert will provide advice based on the crop images.
APEDA Farmer Connect	Agricultural and Processed Food Products Export Development Authority (APEDA)	By using this mobile app a farmer can apply online for farm registration and approval by state government and lab sampling by authorized laboratories. An authorized State Government Officer, farmer or registered laboratory can login to access the information. This app also has in-built GPS capabilities to identify the farm location of the applicant.
Plantix	PEAT, Germany	Plantix is a mobile app, used for plant disease diagnostics and monitoring. The App provides information concerning best practices, information on preventive measures and independent options for action. Plantix offers to send pictures of affected plants directly via smartphone and guides through an identification process to determine the plant disease in a very simple manner. All pictures sent via this App are tagged with coordinates, which enables real time monitoring of pests and diseases.
e-NAM Mobile App	Small Farmers' Agribusiness Consortium (SFAC), Ministry of Agriculture & Farmers Welfare, Govt. of India	National Agriculture Market (NAM) is a pan-India electronic trading portal promoted by the Government of India which networks the existing mandis to create a unified national market for agricultural commodities. The purpose of the Mobile App is to facilitate remote bidding by traders and access to arrivals and price related

		information to farmers and other stakeholders on their smartphones.
AgriMarket	Ministry of Agriculture and Farmers Welfare, Govt. of India	The app has been developed with an aim to keep farmers abreast of crop prices. This app automatically captures the location of the person using mobile GPS and fetches the market price of crops in those markets which fall within the range of 50 km.
Digital Mandi India	Appkiddo	This App helps in checking the latest Mandi prices of agricultural commodities reported from different states and districts in India.
Meghdoot	The Ministries of Earth Sciences and Agriculture, India	The app will provide weather forecast relating to temperature, rainfall, humidity, and wind speed and wind direction, which play critical roles in agricultural operations and advisories to the farmers on how to take care of their crops and livestock. The information would be updated twice a week on Tuesdays and Fridays.
Mausam	The Ministry of Earth Sciences, India	Mausam app provides five weather services – current temperature, humidity, wind speed and wind direction for 200 cities and the information is updated eight times a day. There is also information on sunrise, sunset, moonrise and moonset, three hourly warnings of local weather phenomena and their intensity issued for about 800 stations and forecast of weather conditions for 450 cities for the past 24 hours.
RiceXpert	ICAR-National Rice Research Institute (NRRI), Cuttack	It is a bilingual (English and Odia) Android app with a view to reach the latest rice technologies to the rice farmers in real time basis. It provides real time diagnosis of insect pests, diseases, nematodes, weeds, nutrient deficiencies and toxicities to farmers. It has other features like rice varieties, agricultural implements, news, expert consultation through e-advisory services and weather information.
Mana Verusanaga App	Regional Agricultural Research Station, Tirupati, Acharya N.G. Ranga Agricultural University, Andhra Pradesh, India	This app provides detailed information to the farmers and extension personnel on all aspects of groundnut cultivation including varieties, seeds, nutrient management, pest and diseases, farm mechanization, value addition and contact details with photographs.
Mobile App on Castor	ICAR - Indian Institute of Oilseeds	This mobile app provides information on castor production technologies, recommended hybrid

	Research (IIOR), Hyderabad	varieties, intercropping, major insects, pests, diseases and their control measures to castor farmers.
Solapur Anar	ICAR - National Research Centre on Pomegranate (NRCP), Solapur	The main aim of this app is to educate pomegranate growers about scientific pomegranate production practices.
Cane Adviser	ICAR-Sugarcane Breeding Institute, Coimbatore, Tamil Nadu	Cane Adviser is an ideal mobile app for cane growers and millers. It provides details from planting to harvest with text and graphics for tropical and sub-tropical India. The features of this app include static as well as dynamic platforms.
Pashu Poshan	National Dairy Development Board (NDDB)	With the help of this app balanced ration can be formulated while optimizing the cost considering animal profile i.e. cattle or buffalo, age, milk production, milk fat, and feeding regime etc. and milk producers are advised to adjust the quantity of locally available feed ingredients offered to their animals along with mineral mixture.
Cattle Expert System	TNAU, Coimbatore and C-DAC, Hyderabad	Cattle expert system is a mobile app that covers feeding management for cattle and buffalo, breeding management, diseases and their control management, production technology, calf management, general care etc. for cattle and buffalo.
m-Krishi Fisheries App	Tata Consultancy Services (TCS) Innovation Lab – Mumbai, in collaboration with ICAR- Central Marine Fisheries Research Institute and Indian National Centre for Ocean Information Services (INCOIS) Hyderabad	The app provides vulnerable fishermen access to knowledge and information services on weather, potential fishing zones, ocean state forecasts, disaster alerts, market related information etc.
RML Farmer	RML AgTech	Farmer can get information related to weather forecast, market price, crop and farm related news as per their location in their preferred language. The app gives personalized recommendations, keeps track of pest and disease attack.
My Agri Guru	Mahindra Agri Solutions, Mahindra	MyAgriGuru connects farmers and agri-experts across the country. The farmer agri-expert

	and Mahindra	interactions cover over 90 diverse crops – ranging from Cotton, Wheat, Tomato to non-traditional crops like Tulsi, Aloe vera, Flowers etc.
Rythu Nestham	Rythu Nestham Foundation	Rythunestham is a software platform which helps farmers in organic farming. This mobile app is available in both English and Telugu.
Kultivate	Gowthaman Ramasamy	Kultivate is a mobile app aiming to fill the gap in traditional agricultural extension to make “Smart Agriculture Extension Easy for Everyone.

Disadvantages of Mobile Applications

As much as mobile apps has its advantages there are some shortcomings as well. With the diversity in languages, even if the best of the applications do not support regional languages then translation will be required at all stages which will increase the dependency and in turn reduce the acceptability and popularity (Cantor, 2009). At times, due to network issues, speed of the data delivery, legal restrictions, it might prevent the farmers by getting the updated and complete information (Kirk, 2011). There may be a requirement of a skilled person to understand and translate the various complex functions to be performed on the farm, ambiguous information and videos in other languages (Baumuller, 2012). The farmers in the developing nations may not be adequately equipped to afford and use the applications which may be chargeable and also require huge data usage thereby levying the network charges on the burdened shoulders of the farmer (World Bank, 2012).

The usage of mobile apps

Mobile communications technology has become the world’s most common way of transmitting voice, data and services, and no technology has ever spread faster like mobile. At the end of 2011 there were almost 6 billion telephone subscriptions worldwide and the number reached 8 billion by the end of 2016. Mobile phone usage is playing a vital role for the enhancement and betterment of farmers’

business towards agriculture and also farmers' access to better understand the agricultural market situation. Nowadays, the mobile phone has generated an opportunity for the farmers especially to get all the information related to crop cultivation, marketing and weather.

Awareness Programme on Mobile Apps by Bihar Agricultural College (BAC)

Every year krishi mausam sewa (GKMS) Project, BAC, Sabour arranges different farmer awareness programmes and also youth wariness programmes at different block levels to aware about different mobile apps, their usefulness and operating procedures. We also distribute leaflets on mobile apps among the farmers during the kisanmela at Bihar Agricultural University (BAU), Bhagalpur.

The emergence of the digital revolution and internet penetration in rural areas has enthralled farmers to access new apps that would keep in touch with modern technology. Several new apps are emerging in response to new requirements and challenges in agriculture and allied sector. Apps are being utilized for different kind of functionality regarding the farming activities like crop information, pesticides, fertilizer, seed, selling of crop, irrigation information, estimation of crop production, information regarding the best practices of farming and weather information etc. As the number of apps is continuously increasing it is important to be selective in choosing the app and ensures that

the App provides credible and current information according to the requirements.

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References

Baumüller H. Facilitating agricultural technology adoption among the poor: The role of service delivery through mobile phones 2012.

Cantor E. Reaching the Hardest to Reach: Mobile apps for low-income communities, Mobile Web Africa Conference, Johannesburg, South Africa, 13-14 October 2009.

Kirk M, Steele J, Delbe C, Crow L, Keeble J, Fricke C, Myerscough R and Bulloch G. Connected agriculture: The role of mobile in driving efficiency and sustainability in the food and agriculture value chain. Vodafone and Accenture, Report 2011

Rossi V, Salinari F, Poni S, Caffi T and Bettati T. Addressing the implementation problem in agricultural decision support systems: the example of vite.net®. *Comput. Electron. Agric.* 2014; 100: 88–99.

Shah P, Gandhi N and Armstrong L. Mobile applications for Indian Agriculture Sector: A case study. *Proceedings of Asian Federation for Information Technology in Agriculture 2014*; pp. 424 – 434.

World Bank, Info Dev. ICT in Agriculture Sourcebook, Agriculture and Rural Development 2011.

World Bank. Mobile Applications for rural development by Christine Zhenwei Qiang, Siou Chew Kuek, Andrew Dymond and Steve Esselaar 2012.

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