

Empowering Farming Community Through Mobile Applications: Changing Scenarios

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Abstract: From cloudy skies to blowing winds, nature has been the sole guide for the farming community since time immemorial. However, with changing times, the sectorial needs also change and mere reliance on assumptive natural signs not only becomes insufficient, but also poses risk owing to the uncertainties associated with them. It is when the innovation comes in to bridge the gaps. The use of mobile technology in the aid of farmers has come a long way since its introduction. Many mobile applications have been developed by government and non-government agencies to help the farmers. They provide information related to weather, rainfall, soil condition and also issue advisories related to cropping and allied activities. This is no less than a revolution since mobile technology has replaced the need for farmers to visit government offices, meteorological centers and labs to gather information before, during and after every cropping season. Farmers can access all this information at the very touch of a button. It is also helping the community in realizing its dream of inclusion. With the use of mobile technology information can transcend across physical and geographical barriers, empowering the farming community.

Index Terms: uncertainties, immemorial, risk, advisories, meteorological, cropping, mobile technology, farming community

1. INTRODUCTION

In the modern era of spontaneous generation and dissemination of information, the mobile technology has become the world's most widely used method of transmitting information in various forms like voice, pictures, video, data, etc., around the world. This inter-connectedness of information flow has also resulted in reliance of agriculture and allied activities on mobile technology in a manner that traditional methods are subsequently being replaced by the modern ones. Mobile applications in general and specific mobile applications for farming and rural development in particular have significant potential to enhance the development and advancement of agriculture and rural communities. Agriculture along with its allied sectors, is the largest source of livelihood in India as around 70 percent of rural households are primarily dependent on agriculture. Information technology when channeled through mobile communication can play a very important and crucial role in various stages of farming, right from selection of crop to be planted to the final disposal of produce to the end consumer (Mylavarapu 2018). The current mobile-cellular market has a share of 499 million subscribers in rural India, out of which 109 million users own smartphones. This accounts for nearly 60 percent of the new subscription growth. The rural India is expected to reach 1.2 billion mobile cellular subscribers by 2020 if this pace of growth in terms of market share is maintained (Kantar-IMRB, 2017). One of the prime reasons which enhances the smartphone's utility for farmers is the presence of various built-in technical utilities and features like camera, geo tagging, motion sensor, etc. (Suporn et al., 2015). Various mobile applications are directly and indirectly helping the farming community by improving the overall productivity by enabling them to take more informed decisions regarding seed selection, sowing, production techniques, identification of disease, appropriate IPM techniques, soil management, water management, harvesting, post-harvest technologies, storages, government subsidies,

raising livestock and real time market price tracking. Mobile technologies, thus, provide best solutions to farmers which consequently have positive impact on agriculture and allied sectors (Milovanovic 2014 and Ndzi et al., 2014). Farmers need rapid and timely information for specific purposes and for the very reason the mobile applications that provide latest agriculture information about recent trends, technologies and methodologies gain importance.

Government of India has launched various computer and mobile based applications developed by various agriculture institutes, NGOs and private sectors, for utilization by farmers and other stakeholders. These applications can be downloaded from the various app stores or alternately from the official website mkisan.gov.in. These applications are bridging the gap between farmers and extension personnel helping farmers by maintaining two-way communication and a dynamic exchange of information for day to day farming (Saravanan, 2014). Data mining plays an important role in discovering knowledge, analyzing and developing relationship between the agriculture data attributes and improving scientific decision making (Tripathy et al., 2014, Kamilaris et al., 2017). This study focuses on how various mobile applications are playing a pivotal role in empowering the farmers in India.

2. METHODOLOGY

This study is based on real time testing of agriculture related mobile based applications available on the google android platform. In order to understand their user friendliness in practical terms, we downloaded and tested several mobile based farming-oriented applications. We accessed the applications and collected the information as to how and to what extent they are enriching the farming community. Applications which are free to access and are providing scientifically designed information to the farmers on a real time basis have been included in this paper.

3. ROLE OF MOBILE APPLICATIONS

Mobile based applications addressing the needs of agriculture and allied sector communities are bridging the information and communication gaps that exist between farmers, researchers, market and extension personnel. Among a wide range of advantages that mobile phones offer are their affordability, wide ownership, voice and data communication, and instant and convenient delivery of services. Due to the vast

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penetration of mobile phones, there has been an exponential rise in the number of mobile applications. This is facilitated by the evolution of mobile networks that now support greater data speeds and connectivity, and falling prices of mobile handsets across the globe (World Bank, 2012). The wide range of customization and adaptability that mobile phones offer, has led to the development of new agricultural applications and services curated for the benefit of farmers and other stakeholders.

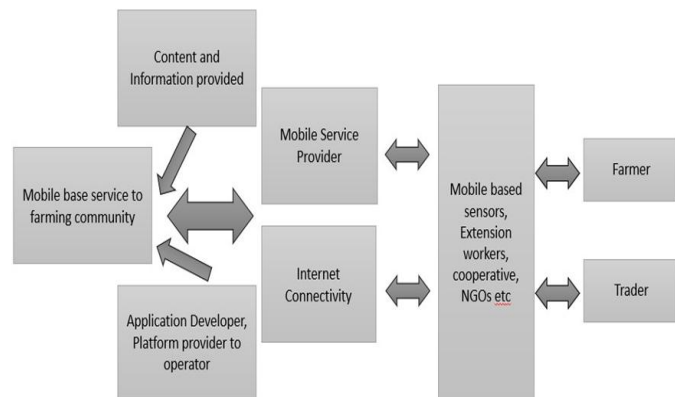


Figure 1: Complex mobile based agriculture information flow

4. RESULT ANALYSIS

On the basis of a survey conducted on Google Android market, following application were found to be most easily and freely accessible agriculture oriented mobile based applications.

4.1 Kisan Suvidha

Kisan Suvidha is a multipurpose mobile based application developed for providing relevant information to farmers like weather report, market prices, dealers, agriculture advisories, soil health card, call to KCC, IPM practices, information about cold stores and plant protection, management information about weed and diseases, etc. Farmers can easily register through mobile number, and choose language and location details. Information is available for various agriculture crops in many local languages.

4.2 Pusa mKrishi

This application provides one-stop platform to farmers. It promotes agribusiness ventures through technology development and commercialization for farmers as well as for corporate individuals. This application also provides information related to new varieties of crop developed by various research institutes like Indian Council of Agriculture Research (ICAR), weather information, market prices, farm machinery as well as identification of crop pest and disease with management. This application also enables farmers to have real time discussion with the stakeholders.

4.3 eNAM

National Agriculture Market (NAM) is a platform promoted by the Government of India for electronic trading pan-India, which links all the networks of existing mandis to bring unified national market for agricultural commodities by facilitating remote bidding by traders and access to real-time arrivals and price information to farmers and other stakeholder on their

smartphones. This application provides price and commodity filter with respect to states, APMC and commodities, bidding filter and suggestion. Traders can enter fresh bid and/or bid price can be changed. Farmers can access information about various mandis in various states along with commodity prices.

4.4 Soil Health Card App DACF&W

This application is a flagship program of the Ministry of Agriculture & Farmers Welfare, Government of India to issue Soil Health Cards (SHC) to farmers. SHC provides status of soil nutrients with respect to 12 parameters namely N, P, K, S, Zn, Fe, Cu, Mn, Br, pH, Electric Conductivity (EC) and Organic Carbon (OC) to individual farmer and also provides advice on the fertilizer dosages and other soil amendments which should be applied to soil in the long run. This application registers soil samples with information of farm fields along with longitude and latitude of field to the national portal ensuring authenticity of samples. Registration on this application requires essential details about farmer (Aadhar number, mobile number and address), land details (including irrigation facility, irrigation source and type) and crop details (crop pattern, variety and duration), etc. The collected samples are tested in the labs and report of soil health is updated and stored on server.

4.5 Plantix

Plantix application is developed by PEAT in collaboration with ICRISAT. This application comes with tag line "Your Crop Doctor" because this application helps in diagnosis and monitoring of plant disease. This application provides platform for worldwide users with native information regarding best disease and pest management practices along with instant diagnostics. Plantix works on real time diagnosis of uploaded image of crop with disease and offers prescription by image recognition technology. This application also provides information about weather and also facilitates interactions among farming community.

4.6 IFFCO Kisan Agriculture

The IFFCO Kisan Agriculture application is exclusively dedicated to the farming community, which facilitates the farmers' access to the information about latest mandi prices, weather forecast, advisory for various agriculture allied sectors like animal husbandry and horticulture. Farmers can get instant access to various mandi prices for their agriculture produce and can plan sale accordingly. Data regarding mandi prices are provided by AGMARKNET and NCEDX. Weather section in the application provides forecast information for the next five days with temperature, relative humidity, possibility of rainfall, wind speed and direction. This application provides a feature named ask our experts, through which farmers can directly talk to agriculture subject experts for advice. IFFCO Kisan Agriculture also provides information about crops, field preparation, cropping cycle, IPM and irrigation management practices.

4.7 riceXpert

This application is developed by ICAR-National Rice Research Institute, Cuttack with the vision to ensure the food and nutrition security, prosperity and sustainability through rice. It provides real-time information on recent technological developments, IPM, irrigation, nutrients, weeds control, and different rice varieties for different ecological zones and post-harvest technology. Farming community can use riceXpert as

diagnostic tool on farm through text, picture and voice and can get quick solution to their query.

4.8 Apni Kheti-Agriculture Information & Farming App

Apni Kheti mobile application provides right information at right time in multiple languages through its comprehensive and innovative platform by engaging rural farming community throughout country. This application provides information about field preparation, sowing, fertilizer doses, crop protection, and harvesting of crops. This application also provides information regarding livestock management, feed, breeding, diseases, etc. Farming community can also have access to accurate, rapid and free solutions to all their queries. They can also strategize to improve sustainable production through real time connectivity. Farmers can get access to latest mandi rates and advisories from industry experts and research universities, etc., along with motivated stories of progressive farmers.

4.9 Krishi Network-Kheti-App

This application provides information regarding weather updates, mandi prices, organic farming, seeds, fertilizers, irrigation, micro irrigations like sprinkler, poly house cultivation, land details, recent news, crop insurance, SHC, etc. This application also provides information about various government schemes like PM Kisan, PM Sinchai Yojna, PMFBY, etc.

4.10 Crop Insurance

This is the application developed to facilitate government scheme named Pradhan Mantri Fasal Bima Yojana (PMFBY) by Ministry of Agriculture & Farmers Welfare. Farmers can get access to various informations regarding PMFBY and can avail the facility of applying for the scheme through mobile just by providing some mandatory information of crop. They can also calculate insurance premium with the help of this application. Farmers can also file a complaint through this mobile application and seek grievance redressal.

4.11 Farmitra- Caringly Yours

This application is developed by Bajaj Allianz and dedicated to empowering farming community with the various useful information including weather forecast, advisories for crops, market price for various crops across India, stories and news articles related to farming etc. through mobile technology. Application provide advisory in various regional languages to facilitate farmers from various states. Farmitra application also facilitates farmer with claim services for crop insurance and real time check and raise queries.

4.12 BharatAgri: Smart Farming, Agriculture Expert App

BharatAgri is another application for farmers which helps them in decision making to increase profitability and reduce cultivation cost. Farming community can get advisory for more than 150 crops. The crop advisory includes fertilizer doses management, irrigation management, insect pest and disease management. Application also facilitates farming community with weather forecast, market prices and authentic inputs from verified dealers. Farmers also gets alerts regarding latest techniques advancement and development along with best solutions regarding problems from agri expert through this application.

4.13 Other Applications

Apart from the above-mentioned mobile applications, there are several other applications which are developed by academia, industry, NGOs and other bodies/individuals. Some of these applications are region specific, while many others have presence across the country. A few of such other mobile applications include Farmersgrid- Agriculture & Farming, NaPanta, AgroMedix Agriculture, Agrowala, Agriscience Krishi, Marketyard, Agrowon, Rythunestham Organic/Natural Farming, MyAGriGuru, Krushik, AgriCentral- Smart Farming for all, Vivasayam, Uzhavan, etc.

5 GENERATED OUTCOMES BY MOBILE APPLICATIONS FOR FARMING COMMUNITY

5.1 Access to Right Information at Right Time

Mobile based applications are providing smooth access to information about market price changes, current mandi rate, produce that is in higher demand, irrigation management, fertilizer dosage, field preparation, crop selection, climate, technological advancement and disease information. So the farmers are now able to take advance measures and plan their agri-operations accordingly.

5.2 Access to Extension Services

Extension services became rapid, more than ever before, through mobile based applications. These applications are playing important role in bringing innovation and advancement in lab-to-field measures. Best practices and schemes developed by various government and private organizations are reaching farmers, which results in increased yield production by two-way communication through various mobile based applications and also helps in assessment of extension activity.

5.3 Bridge between Direct Market Links and Distribution Networks

Through mobile applications, farmers are able to access information about real time mandi prices, which leads to greater prices realization by farmer and less exploitation by middlemen. These applications are facilitating the direct communication between the farmers, suppliers and buyers, which in turn helps in developing a more efficient distribution chain.

5.4 Effective Accounting, Recording and Traceability

Mobile based applications have led to the advancement of the farmers with increased efficiency and predictability, reduced administrative costs and less exploitation by middlemen, which also improved quality standards for buyers and reduced frauds.

5.5 Access to Finance Opportunities

Mobile based applications are empowering farmer by making the services of various finance institutions available on their smartphone devices, which provides information about government aid to farmers, various subsidies on farm equipments, Kisan Credit Card and insurances. This in turn leads to higher yield and diverse production.

6 CONCLUSION

With the constantly evolving arena of mobile technology, agriculture and its allied sectors are more likely to see further integration and dependence on it. The use of information technology tools that are easily accessible, farmer friendly and generally inexpensive in agriculture has dramatically altered the production-consumption interface. Now the farmers are in a position to take informed decisions well in advance, which has not only helped in amplifying the production, but has also made the agriculture risk-free to a larger extent. With further developments and community involvement, the mobile technology will ultimately pave way for a more prudent and climate resilient smart agriculture.

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Table 1- Available source link to download applications from google android market

S. No	Application Name	Available link to download
1	Kisan Suvidha	https://play.google.com/store/apps/details?id=in.cdac.bharatd.agriapp&hl=en_IN
2	Pusa mKrishi	https://play.google.com/store/apps/details?id=com.tcs.mkrishi.cca&hl=en_IN
3	eNAM	https://play.google.com/store/apps/details?id=in.gov.enam&hl=en_IN
4	Soil Health Card App DACF&W	https://play.google.com/store/apps/details?id=com.nic.soilhealthcard&hl=en_IN
5	Plantix	https://play.google.com/store/apps/details?id=com.peat.GartenBank&hl=en_IN
6	IFFCO Kisan Agriculture	https://play.google.com/store/apps/details?id=com.IFFCOKisan&hl=en_IN
7	riceXpert	https://play.google.com/store/apps/details?id=com.icar.ricexpert&hl=en_IN
8	Apni Kheti-Agriculture Information & Farming App	https://play.google.com/store/apps/details?id=com.cogneesol.apnikhetiapp&hl=en_IN
9	Krishi Network-Kheti App	https://play.google.com/store/apps/details?id=com.krishi.krishi&hl=en_IN
10	Crop Insurance	https://play.google.com/store/apps/details?id=in.farmguide.farmerapp.central&hl=en_IN
11	Farmersgrid- Agriculture & Farming	https://play.google.com/store/apps/details?id=com.adish.farmersgrid&hl=en_IN
12	NaPanta	https://play.google.com/store/apps/details?id=com.napanta.farmer.app&hl=en_IN
13	AgroMedix Agriculture	https://play.google.com/store/apps/details?id=com.igra.agromedix&hl=en_IN
14	Agrowala	https://play.google.com/store/apps/details?id=com.agrowala.india&hl=en_IN
15	Agriscience Krishi	https://play.google.com/store/apps/details?id=com.agriscienceapp&hl=en_IN
16	Marketyard- Kisan/Farmer Agri App	https://play.google.com/store/apps/details?id=com.globalfarm.marketyard&hl=en_IN
17	Agrowon	https://play.google.com/store/apps/details?id=com.sakal.agrowon&hl=en_IN
18	Rythunestham Organic/Natural Farming	https://play.google.com/store/apps/details?id=rutherford.apps.raithunestam&hl=en_IN
19	MyAGriGuru	https://play.google.com/store/apps/details?id=com.myagrigure&hl=en_IN
20	AGriCentral- Smart Farming for all	https://play.google.com/store/apps/details?id=com.globalagricentral&hl=en_IN
21	Farmitra- Caringly Yours	https://play.google.com/store/apps/details?id=com.bagic.farmitra&hl=en
22	BharatAgri	https://play.google.com/store/apps/details?id=com.leanagri.leannutri&hl=en_IN
23	Vivasayam	https://play.google.com/store/apps/details?id=nithra.tamil.vivasayam.agriculture.market&hl=en_IN
24	Uzhavan	https://play.google.com/store/apps/details?id=agri.tnagri&hl=en_IN