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A STUDY ON AWARENESS AND USE OF MOBILE PHONE APPS AMONG FARMERS OF AMBALA AND YAMUNANAGAR DISTRICTS OF HARYANA STATE OF INDIA

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Abstract *This study is an attempt to explore the awareness and use of mobile apps among the farmers of Ambala and Yamunanagar districts of Haryana state of India. This study aimed to determine how different mobile applications were being used by the farmers in agricultural practices. For the present study, survey method was adopted using questionnaire with the aid of interview as a data gathering tool. For data collection, during March–April, 2023, copies of self designed questionnaire were distributed manually on random basis among 300 farmers of six areas/blocks of two districts of Ambala and Yamunanagar. Out of total 300 administered questionnaires, interestingly all the questionnaires were received back and found valid for analysis and thus 100% response rate has been achieved. The study revealed that about 80% of the farmers were familiar with the use of ICT and mobile phone applications in various farming practices. The study also found that 42% of the respondents/farmers find easy to use various mobile apps in farming practices and 75.66% of the respondents were using different mobile phone applications for getting information about pest and disease control in crops. More than 75% of the farmers/respondents were in the opinion that mobile apps are quiet useful in their farming practices to get the required information timely.*

Keywords: *ICT Literacy, Information Literacy, Awareness, Usage of Mobile Apps, Utilisation Pattern, Agricultural Practices, Haryana*

Introduction

Information and Communication Technology (ICT) has changed the way of doing every activity globally. ICT has played a crucial role in providing of new ideas, methods and techniques, and solutions for imparting and sharing information among the peoples of different walks of life. Similarly, ICT has played a very crucial role in the development of agricultural sector of India as well as transformed the farming scenario worldwide. With the use of ICT, farmers can get appropriate and timely information on every aspect of agriculture. Agricultural machinery, Artificial Intelligence (AI) and mobile applications have changed the ways of farming practices particularly in India. "ICT diffused information and knowledge among societies especially in rural areas of the developing countries. There is no doubt that by using communication technologies rural people have improved their agricultural and product. The use of ICTs for instance mobile phones have brought significant changes in agriculture development. Now, in this digital and competitive era, mobile phones have given new thinking and approach to farmers for making a decision about getting the information of market and weather from concern person, and now the farmers can communicate with customers to sell their product in good price same time they can keep up to date each other's about market as well as weather" (Chhachhar, 2014).

In India, agricultural institutes, universities, NGOs, Government societies and Indian Council of Agricultural Research (ICAR) have developed some of the farmers friendly mobile applications for different crops in different seasons. Farmers can use some other common mobile apps to share relevant information timely. In rural areas, main employment opportunity for rural peoples is agriculture so agricultural activities must be updated as per the need of the day. Enhancing the use of mobile phone will empower farmers with relevant agriculture information. Mobile phone has now become a dire need of every person of the rural as well as of urban society. Nobody can think about the life without mobile phone in this era. For farmers, efficiency in using mobile phones has significantly influenced the way they work and improve their living standards. A mobile phone helps to disseminate information with no time limit.

For the development of agriculture as well as farmers, timely information can play a very important role. Mobile phone apps are now become a fast and efficient medium of communication among the progressive farmers and by the use

of ICT and mobile Apps, they can increase the productivity as well as financial status of them, hence, mobile phone technologies or applications have provided a good and solid communication platform for farmers' community to share their knowledge and information among other agricultural fraternity timely. There are some popular mobile apps, which are in use among the farmers' community in India for sharing important information about agriculture and other associated subjects. WhatsApp, Facebook, Instagram and YouTube are common apps, and some agricultural specific apps, such as IFFCO Kisan Agriculture, Krishi Jagran, Pusa Krishi, Agri App, Bijak App, Crop Insurance, Kheti-Badi, Agri-Market, Shetkari, Kisan Suvidha, FarmBee App and KVSMT are being used by farmers community widely throughout India for sharing and acquainted with the new research and information related with agriculture. "Moreover, farming apps are the most convenient and useful medium to guide farmers in farming. It gives the guideline for doing 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 attacks or any problems which put them in a difficult situation" (Krishijagran, 2023).

Though mobile technology has affected and changed the mindset of farmers towards farming practices, yet some issues are there, which can be identify to get better result. In the rural areas, education level as well as availability of technological support system lacks as compare to urban areas. Therefore, the researcher feel that there is a need to study the awareness and use of mobile apps among farmers of Ambala and Yamunanagar districts of Haryana state of India, which are popularly known as paddy belt of the state. The results of the study could reveal some interesting facts, which can be used for further improvement of mobile technology/services and agricultural productivity in rural areas.

Literature Review

Dharmender Singh et al. (2023) conducted a study to explore the utilisation pattern of mobile apps among farmers for agricultural production in Haryana and found that majority of the farmers have good knowledge of agricultural mobile apps and more than half of the farmers perceived medium level of utilisation pattern of agriculture mobile apps on agricultural practices, but suggested that farmers should proper utilise and implement the recommendations suggested by agriculture experts through mobile apps. On the other hand, Abdullahi et al. (2021) investigated the attitude, knowledge and constraints associated with the use of mobile phone applications by the farmers in North West Nigeria and found that "farmers have positive attitude towards mobile phone applications, and knowledgeable of simple phone operation techniques, while the researchers also found some constraints to the use of mobile phone applications among farmers were high cost of phones, poor network, poor power supply, high cost of airtime and complexity in operating phones; however, researchers also recommends training and re-retraining of farmers and extension agents on the use of mobile phone apps for effective information sharing among farmers in the North West region of Nigeria". A study was conducted in rural areas of Oshana Region of Namibia by Ujakpa et al. (2021) to explore the farmers' use of mobile devices and explore that farmers' use of mobile devices adds value and economic benefits to their practices, and farmers were using mobile devices to get up-to-date information on input and output market transactions, weather information, and banking services, whereas, the researchers also recommended that mobile agricultural information service providers must be team up with information systems experts to develop mobile applications that provide agriculture information in its simplest and comprehensive form. Nikam et al. (2020) conducted a study on "farmers mobile use pattern, information sources and perception about mobile app for grapes and observed that more number of farmers were using social network particularly WhatsApp and Facebook, indicating greater potential of these apps for the purpose of dissemination of extensions and advisory services to the farmers, while along with multimedia effect, these social networks give opportunity to the farmers to interact with the experts, fellow farmers and also to share the pictures of problem like diseases and pests for accurate solution of their problem".

To know the use of mobile phone applications by farmers in North West Nigeria, a study was conducted by Khidir Abubakar and et al. (2019) and found that "farmers' awareness of mobile apps was low and they minimally used these apps for farming activities, whereas, the majority (96%) of the farmers owned a mobile phone; awareness of the call app and SMS app were 100% and 97% respectively". Ramli et al. (2019) conducted a study to know the "seeking of agriculture information through mobile phone among paddy farmers in Selangor, Malaysia and observed that paddy farmers in Selangor were comfortable with using mobile phones in seeking agricultural information, and WhatsApp was the best choice to get and share information using a mobile phone, whereas, the highest agriculture information the farmers sought was information on pest control, farm safety information, and information on pesticide/weed". Similarly, Selvi and Balasubramaniam (2019) conducted a study to explore the usage of mobile apps in agriculture and found that farmers got more awareness about mobile apps and through mobile apps they were getting agricultural and allied information timely, whereas, researchers also found some problems, which are associated with the use of mobile apps among farmers such as poor network services, high

charges, language problem and required skill. A study on "awareness and impact of agriculture apps on production and farmers livelihood security was conducted and it was found that usage of agricultural Apps were not widely using by the farming community, hence researchers suggested that there is a large promotion required to use of these Apps with the farming community to install these Apps in their android mobiles and get the information on crop cultivation, market prices on daily basis on fruits, vegetables, cereals, pulses, spices & oil crops along with other commercial crops" (Anitha & Thippeswamy, 2018). Chisama (2016) conducted a study on "farmers' use of mobile phone technology for agricultural information services in Lilongwe District, Malawi and revealed that farmers with mobile phones were not aware of mobile agricultural information services as compared to mobile money transfer services, while researcher also found that farmers were capable of using the same tool for farming-based mobile money transfers".

A lot of studies have been conducted on the topic but no study was found, which was conducted on the farmers of North Haryana, therefore, the current study has been planned to fill this gap.

Objectives

The key objectives of the present study are:

- To find out the awareness and use of mobile apps among the farmers.
- To ascertain the usefulness of mobile apps among the farmers.
- To explore the purpose of using mobile apps by the farmers.
- To find out the frequency of usage of mobile apps for agricultural activities.
- To discover the purpose for which the farmers use the mobile apps.
- To learn the satisfaction level among the farmers about the use of mobile apps.
- To examine the various factors responsible for using mobile apps by the farmers.
- To study the various problems faced by the farmers, and to give suggestions for improvement.

Scope and Limitation of the Study

The scope of the present study is limited to explore the level of awareness and utilisation pattern of mobile apps among farmers of Ambala and Yamunanagar Districts of Haryana State of India. The study also explores the farmers' attitude towards the use of ICT tools, mobile applications and other technology, and various issues faced during agricultural practices. Furthermore, three blocks from each District have been taken into consideration on random basis for this study, that is, Saha, Naraingarh and Shahzadpur blocks from Ambala District, and Bilaspur, Chhachhrauli and Radaur blocks were selected from Yamunanagar District.

Research Methodology

This study adopts the survey method using questionnaire to collect the data from the targeted respondents. In some cases, personal interviews have also been made in order to get clarification about the collected data. For this study, two districts of Haryana State of India were selected, that is, Ambala and Yamunanagar, and further three blocks from each district were selected on randomly basis. From Ambala district, Saha, Naraingarh and Shahzadpur blocks were selected, and from Yamunanagar district, Bilaspur, Chhachhrauli and Radaur blocks were selected for study. The work of data collection was done during February–April 2023. Copies of self designed questionnaire were distributed manually on random basis among 300 farmers of six areas/ blocks of two districts of Ambala and Yamunanagar. Out of total 300 administered questionnaires, all the questionnaires were received back and found valid for analysis, and thus 100% response rate has been achieved. The collected data were then analysed and interpreted in accordance to the aims and objectives of this study with simple percentage analysis. APA 7th edition is has been used for giving citations and references.

Data Analysis and Interpretation

The collected data were arranged and interpreted in the following tables:

Table 1: Awareness about ICT and Mobile Phone Applications

Awareness	Respondents	Percentage
Fully aware	47	15.66
Aware	139	46.34
Somewhat aware	98	32.66
Not aware	16	5.34
Total	**300**	**100**

Table 1 shows the awareness about ICT and mobile phone applications among farmers of Ambala and Yamunanagar districts of Haryana state of India. The study found that 46.34% of the farmers were aware to the use of ICT and mobile phone applications in various farming practices, whereas, 32.66% of the farmers were somewhat aware. On the other hand, 15.66% of the farmers were fully aware to the use of ICT and mobile phone apps, whereas, a very low number (5.34%) of farmers were not aware to the use of ICT and mobile phone apps in their various farming practices.

Table 2: How Often Do You Use Mobile Apps?

Frequency of using Mobile Apps	Respondents	Percentage
Everyday	147	49.00
Weekly	89	29.67
Fortnightly	47	15.66
Monthly	17	5.67
Total	**300**	**100**

The presented data in the Table 2 depicts the utilisation of mobile phone apps among the farmers for farming practices and it was found that around half of the respondents (49%) were used mobile apps every day, whereas, 29.67% of the respondents used mobile apps weekly. Another side, 15.66% of the respondents replied that they used mobile apps once in a fortnight, while a small number (5.67%) of the respondents used mobile apps once in a month for various farming practices.

Table 3: How Do You Find using Mobile Apps?

Ease of Use	Respondents	Percentage
Very Easy	113	37.67
Easy	126	42.00
Difficult	41	13.66
Very Difficult	20	6.67
Total	**300**	**100**

The respondents under study were asked how do you find using mobile apps in your farming practices. It was revealed from the data given in Table 3 that 42% of the respondents finds easy to use various mobile apps in farming practices, whereas, 37.67% of the respondents find very easy to use. On the other hand, 13.66% of the respondents were finds difficult to use mobile apps, while 6.67% of the respondents find it's very difficult to use.

Table 4: Purpose of using Mobile Apps

Purposes*	Respondents (n = 300)	Percentage
Pest and disease control	227	75.66
Weed management	88	29.33
Harvesting and storage	75	25.00
Farm safety	57	19.00
Fertilizers/Pesticides	198	66.00
Crop production	111	37.00
Loan/subsidy	101	33.66
Climate/weather	167	55.66
Marketing	40	13.33
Irrigation	93	31.00
Sowing and transplanting	124	41.33
Seed treatment	66	22.00
Contact with agri. Scientists	203	67.66
Contact to KVKs/ATIC, ATMA	133	44.33
Agricultural machinery	40	13.33

* Multiple answers permitted.

The data presented in the Table 4 shows the various purposes of using mobile apps among responded farmers community and the study explored that out of 300 respondents, 75.66% of the respondents were using different mobile phone applications for getting information about pest and disease control in crops, while 67.66% of the respondents were using mobile apps to contact with agricultural scientists for various reasons. On the other hand, 66% of the respondents were using mobile apps to get or share information about fertilisers/pesticides, while 55.66% respondents using mobile apps for climate/weather related information. Similarly, 44.33% of the respondents were using mobile apps to contact with the KVKs/ATIC/ATMA centres of a university or an organisation to get the agriculture related information, whereas, 41.33% of the respondents were using mobile apps for sowing and transplanting related information, followed by crop production (37%), loan/subsidy related information (33.66%), irrigation (31%), weed management (29.33%) and harvesting and storage (25%), respectively. Another side, 22% of the respondents were using mobile phone apps for sharing seed treatment related information, while 19% respondents were using for farm safety purpose, followed by marketing (13.33%) and agricultural machinery (13.33%), respectively.

Table 5: Usefulness of using Mobile Apps

Usefulness	Respondents	Percentage
Very useful	109	36.33
Useful	123	41.00
Somewhat useful	54	18.00
Not useful	14	4.67
Total	**300**	**100**

The Table 5 shows the opinion of responded farmers' community about the usefulness of mobile apps in farming practices. The study found that 41% of the respondents found mobile apps useful, whereas, 36.33% found very useful in their farming practices. On the other hand, 18% of the respondents found somewhat useful, while, a very small number of respondents (4.67%) were found not useful. The

analysis reveals that a big majority (around 95%) of the respondents (farmers) founds use of mobile apps useful in farming practices.

Table 6: How Satisfied are You with the Mobile Apps You Use?

Level of Satisfaction	Respondents	Percentage
Highly satisfied	71	23.67
Satisfied	119	39.66
Somewhat satisfied	68	22.67
Dissatisfied	39	13.00
Highly dissatisfied	03	1.00
Total	**300**	**100**

A question was asked from the responded farmers during the survey that how satisfied are you with the mobile apps you use in their various farming practices. The presented data in Table 6 highlights that 39.66% of the respondents were satisfied, while 23.67% of the respondents were highly satisfied with the use of mobile apps in their farming practices. Another side, 22.67% of the respondents were somewhat satisfied, whereas, 13% of the respondents found dissatisfied with the use of mobile apps in various farming practices.

Table 7: Factors Responsible for using Mobile Apps

Factors*	Respondents (n = 300)	Percentage
Less searching time	160	53.33
Ease of access	233	77.66
Easy to use, store and retrieve	91	30.33
24x7x365 use facility	282	94.00

* Multiple answers permitted.

The data given in Table 7 shows the various factors responsible for using mobile Apps among the responded farmers' community and it was revealed that 24 × 7 × 365 days use facility of mobile apps was a major factor for a big majority (94%) of the respondents, whereas, easy accessibility of contents through mobile apps was the major factor for 77.66% of the respondents, followed by less searching time for information (53.33%) and easy to use, store and retrieve of information were the major factors responsible for using mobile apps for 30.33% respondents respectively.

Table 8: Problems Faced While using Mobile Apps

Problems*	Respondents (n = 300)	Percentage
Internet is slow in village areas	148	49.33
Network problem	111	37.00
High cost of data	107	35.66
Have less technical skills to use mobile phone	79	26.33
Difficult to understand and use of features of mobile phone	55	18.33
Fear of addiction of mobile phone use	32	10.66
Ignorance towards the use of technology	61	20.33
Mobile phone is not effective to get information properly	50	16.66

* Multiple answers permitted.

A question on various problems faced while using mobile apps was asked from the responded farmers' community. The presented data in Table 8 depicts that around half of the respondents (49.33%) were facing the problem of slow speed of Internet in village areas, while 37% of the respondents faces network problem while using mobile apps. On the other hand, 35.66% of the respondents reported that high cost of data was the main problem for them, whereas, lack of technical skills in the use of mobile phone/app was the major problem for 26.33% of the respondents, followed by ignorance towards the use of technology (20.33%), difficult to understand and use of features of mobile phone (18.33%), mobile phone is not effective to get information properly (16.66%) and fear of addiction of mobile phone use (10.66%), respectively were the major problems for farmers' community under study while using mobile apps in their farming practices.

Summary of Major Findings

Summary of major findings of the study are as follows:

- About 80% of the farmers were familiar with the use of ICT and mobile phone applications in various farming practices.
- 49% of the farmers/respondents were using mobile phone apps every day, and 29.67% of the respondents used mobile apps weekly for farming practices.
- 42% of the respondents find easy to use various mobile apps in farming practices, whereas, 37.67% of the respondents find very easy to use.

- 75.66% of the respondents were using different mobile phone applications for getting information about pest and disease control in crops, while 67.66% of the respondents were using mobile apps to contact with agricultural scientists for various reasons.
- About 66% of the respondents were using mobile apps to share information about fertilisers/pesticides, while 55.66% respondents using mobile apps for climate/ weather related information.
- About 44.33% of the respondents were using mobile apps to contact with the KVKs/ATIC/ATMA centres of a university or an organisation to get the agriculture related information, whereas, 41.33% of the respondents were using mobile apps for sowing and transplanting related information.
- Total 41% of the respondents found mobile apps useful, whereas, 36.33% respondents found very useful in their farming practices.
- Around 39.66% of the respondents were satisfied, while 23.67% of the respondents were highly satisfied with the use of mobile apps.
- 24 × 7 use facility of mobile apps was a major factor for 94% of the respondents, whereas, easy accessibility of contents through mobile apps was the major factor for 77.66% of the respondents.
- Around half of the respondents were facing the problem of slow speed of Internet in village areas, while 37% of the respondents faces network problem while using mobile apps.

Conclusion

The present study was conducted with the objective to know the awareness and use of mobile applications among the farmers of Ambala and Yamunanagar districts of Haryana state of India. Today's digital era is a very crucial as well as challenges era for every walks of human life. ICT has changed the way of live life. AI and mobile technology has dramatically changed the way of communication and getting/sharing information by every person of the society globally. The study found that majority of the farmers under study were familiar with the use of mobile applications in their various farming practices, and about two-third farmers were satisfied with the use of mobile apps. Furthermore, the study found that two-third of the farmers were using mobile apps to get or share information about fertilisers/ pesticides, and around 56% farmers were using mobile apps for climate/weather related information. Therefore, the study concludes that the mobile technology or mobile apps are need of the day in this digital era and it can play a very important role in sharing farming related information among the farmers' community very quickly and over the geographical boundaries. Furthermore, the study suggested that mobile network issues must be resolved in rural areas by the local concerned administration and should also organises ICT literacy programs for farming community in rural areas so that farming community can be benefitted and able to use ICT tools efficiently.

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