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RESEARCH NOTE

Mobile Use Pattern of Sugarcane Growers in Kamareddy District, Telangana State**T. Rajula Shanthi¹, C. Vijay Bhaskar Rao² and Jitendra K. Chauhan³**

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ABSTRACT

This study tries to figure out an understanding of mobile use pattern of sugarcane growers in Kamareddy District, Telangana state in terms of their socioeconomic profile, information needs through mobile app, perceived benefits of information delivery on sugarcane through mobile app and the possible constraints involved by interviewing 60 growers from the command area of Gayathri Sugars, Telangana. Demographic profile indicated that they were mostly middle to old-aged with secondary to graduate level of education, had a rich farming experience of more than 25 years and majority owned 3-5 hectares of arable land. Over three-fourth of the respondents had mobile phones with internet facilities and most of them had owned mobile phones for the last 5-10 years. Majority of them got mobile phones to communicate with their family members, relatives and friends, wherein they were using mobile phones to disseminate information related to family matters etc. and hardly use mobile phones to share information on agriculture. The most important information need for the sample farmers was on fertigation schedule, maintenance of drip irrigation system and mechanization to overcome labor problem. All the respondents perceived the benefits of mobile app as access to information any time, time saving as we can get the information at home itself, information can be stored in mobile and referred as and when needed, easy to store information in the mobile phone and can repeatedly browse the information. All the respondents felt the necessity to carry the mobiles always, has to be charged quite often as it would run out of battery, fear of theft of mobile sets and loss of all the information stored if mobile phone is lost. When it comes to using mobile apps for educational purpose, the major constraints experienced by all the respondents are the need for internet connection for using mobile apps, slow internet connectivity and have to recharge for internet connection.

Key words: Sugarcane; Mobile use pattern; Mobile Apps; Perceived benefits; Constraints.

Over the past few years, India had witnessed several experiments on agro-advisory service delivery through mobile phones such as IFFCO Kisan Sanchar Limited (IKSL), Reuters Market light (RML), Kisan sanchar, Fisher Friend, M-Krishi, Kisan SMS Portal and the latest Digital Agriculture Mission 2021-2025. These service providers use a mix of text messaging and voice messaging along with mobile phone-based applications. They provide information about weather, market prices, agro advisories, policies, government schemes, new technologies.

Though several studies (Aker 2008, Aker 2010, Aker & Fafchamp 2010, Mittal et. al 2010, World

Bank, 2011) have demonstrated the potential of mobile phones in improving the capacity of farmers to cope with agricultural risks, many others (Mittal, 2012; Fafchamp & Minten, 2012) have questioned its real impact on farmers. If farmers have to benefit, the messages delivered through the system have to be 'actionable' and available at the right time. It should also be able to create awareness, strengthen capability of farmer to take informed decisions and give alerts in case of emergencies like frost, hail storm, floods. Moreover, the information has to be relevant to their farming context and the model of mobile phone based agro-advisory should be sustainable.

The increasing penetration of mobile networks and handsets in India presents an opportunity to make useful information more widely available. This could help agricultural markets operate more efficiently, and overcome some of the challenges faced by the sector (Jensen, 2007). Jensen also found that the introduction of mobile phones decreased price dispersion and wastage by facilitating the spread of information, which made markets more efficient and enhanced both consumer and producer welfare. Bhavnani *et al.*, (2008) pointed out that despite the increasing rural demand for relevant, timely agricultural information on the one hand and recent advances in quality and capacity of Information and Communication Technology (ICT) services on the other, the benefits remain unevenly distributed among people. The main causes are lack of a policy and regulatory environment and poor availability of ICT and mobile infrastructure.

Bhatnagar (2008) stated that the rural ICT initiatives in agriculture such as computerization of agro-markets, e-Choupal and eSAGU6, informational extension services, digitalization of land records by the Karnataka government and computerization of co-operative milk collection centres have lowered costs for farmers, added value to output and improved transparency in the system.

Paddy expert system mobile application has proved again that ICT had the potential to satisfy the knowledge and information needs of the farmers, and supported them to make the right decisions at right time, which ultimately leads to attaining significant livelihood growth (Karthikeyan and Kumar, 2022).

Vinod Kumar *et al.* (2008) had developed a Knowledge Based System that uses a hierarchical classification and a mix of e-text description, photographs and artistic pictures with two main sub tasks, namely diagnosis and management using visual basic as front-end and Microsoft Access as back-end software.

Mobile phones help co-ordinate supply and demand, enabling traders and transporters to take advantage of the free flow of price information by catering to demand in undersupplied markets. A study on Senegalese fishermen yielded similar results (Rashid and Elder, 2009). The reduction in price dispersion with increased cell phone use is also seen in grain markets in the sub-Saharan African country, Niger. Cell phones have a great impact on price dispersion where travel costs are high (Aker, 2008). Similarly, during a project implemented in Senegal, it was found that farmers in

the field were able to check prices before they set off to markets and thus, they could secure, on average, about 15 per cent higher profits. The adoption of mobile telephony by farmers and agricultural traders in Ghana had helped them reduce their transportation and transaction costs. The members associated with trade networks, equipped with new technology, are able to organize their activities more efficiently and with considerable cost savings (Ragnhild Overa, 2006).

Most efforts to make ICT available to rural farmers have sought to improve the availability and quality of information either indirectly through producer associations, extension workers and the like, or directly through broadcast radio information, telecentres, and mobile short messaging services (SMS) (Bertolini, 2004).

De Silva and Ratnadiwakara (2008) found that mobile phone usage by farmers can reduce information search costs, thereby dramatically lowering transaction costs and enabling greater farmer participation in commercial agriculture. Building trust and relationship with farmers is another aspect that cannot be neglected (Cole and Asanga, 2012; Mittal *et.al* 2010, Lokanathan and De silva, 2010). Farmers generally trust face to face interactive sources of information such as fellow farmers and input dealers more compared to information provided through modern information sources such as mobile phones. A clear shift towards modern information sources requires the service providers to closely interact with farmers, developing trust on their motive and provision of reliable information to farmers.

Despite the increasing availability of mobile phones and supply of agricultural information, the benefits are not reaching the poor (Bhavnani *et. al.* 2008). The main beneficiaries of the mobile phone revolution are the ones with skills and infrastructure. The poor and those living in distant areas are left behind further making them information poor (Mittal *et.al*, 2010). Despite the increasing penetration of mobile phones in rural areas, there is a need for significant improvements in supporting infrastructure like markets, institutional credit, storage and warehouses, roads and capacity development programs for farmers to attain the full potential of mobile phones in agriculture (Mittal and Tripathi 2009). Insufficient extension services and poor access to information further widen the gap in adoption of technology and lead to poor productivity levels. A push towards higher

agricultural productivity will require an information-based, decision-making agricultural system (precision agriculture). This is often described as the next great evolutionary step in agriculture.

Keeping this in view, the present investigation attempted to know the profile of selected sugarcane growers, their mobile usage pattern and information needs through mobile app, perceived benefits of information delivery on sugarcane through mobile app and the possible constraints involved in using mobile phones and mobile app.

METHODOLOGY

The study was conducted by using descriptive type of research design applying ex-post facto approach and the respondents were selected among sugarcane growers who were using mobile phones at least for the last three years. Gayathri Sugars Ltd. is a leading private sugar mill in Telangana State in South India and is a pioneer in introducing recent scientific technologies in cane cultivation. The study area, Gayathri Sugars is located at Adloor Yellareddy village, S.S. Nagar Mandal, Kamareddy District, Telangana State. The operational area of the mill comprises eight divisions from which two divisions viz., Kamareddy East and Kamareddy West were chosen. Sixty cane growers were selected from the villages of Adloor Yellareddy (15), Kuprial (15), Chinna Mallareddy (15) and Rajampet (15) at random for conducting the study. The particulars were collected using an interview schedule and sociological appraisal was done through focus group discussions / observations. Their responses were tabulated and the data were analyzed using mean, percentage analysis, rank analysis and standard deviation as the statistical tools to analyze the collected data.

RESULTS AND DISCUSSION

The present study focused on the demographic profile of sugarcane farmers owning mobile phones, information needs of sugarcane growers through mobile app, perceived advantages of information delivery on sugarcane through mobile app, constraints involved in using mobile phones and mobile app.

Demographic profile of selected sugarcane growers: Demographic profile of the participants of the study indicated that they were mostly of middle to old age group (35-50 years:45 per cent and >50

years:45%) and the rest 10 per cent were in young age category; Majority of them were educated up to secondary and graduate level (91.70%) and 8.3 per cent of illiterate growers also had opined about mobile app usage, though were not quite clear about the intricacies; As high as 96.60 per cent of the respondents were doing agriculture as their main occupation and a meager 3.40 per cent had agriculture as their secondary occupation. As majority of the respondents were full time engaged in agricultural activities, they had high economic motivation to do sugarcane farming profitably and managed their farm in a profitable way. Almost half (46.70%) of them had a farming experience of more than 25 years and 38.30 per cent were in the category of 16-25 years of experience in sugarcane cultivation. The cane growers with more farming experience by virtue of their high exposure to the latest technologies could realize the importance of scientific technologies to improve the productivity of their farms. However, length of experience in sugarcane cultivation is not a major criterion for owning a mobile phone and getting information on new sugarcane technologies. The respondents adopted sugarcane technologies irrespective of their experience in sugarcane cultivation.

Majority of the respondents (65%) were possessing 3-5 hectares of farm land and hardly 6.7 per cent of them owned less than two hectares of land. Majority of the respondents (61.6%) cultivated sugarcane in an area of one to two acres followed by 31.7 percent who grow sugarcane in 3-5 acres. The cane growers of Gayatri Sugars Ltd., follow mainly early season planting i.e. planting from November to February months, the main reason is that during the kharif season farmers grow paddy. All the respondents (100%) included sugarcane in their cropping pattern in rotation with other short duration crops. Sugarcane, being a highly remunerative crop under normal conditions, it forms a part of the cropping pattern in the study area. The other crops include pulses, paddy, maize, and cotton.

Nearly one-fourth (21.7%) of the farmers were self-sufficient of possessing implements and were having all the implements required for their farming activities and 20 per cent of farmers partially depended on hiring implements and partially having their own. More than half of the respondents (58.3%) did not possess any farm implements for their cultivation work and they fully depend on hiring (tractor, tiller,

cultivator, disc plough and rotovator). The size of land holding does not permit them to possess all the required implements.

As high as 68.4 per cent of the respondents owned livestock such as cows, goats, buffaloes, draught animals and backyard poultry for additional source of income, apart from their own use and none of the grower's own livestock for commercial purpose.

Mass media play a remarkable role in disseminating information of a new technology to a large number of audiences within a stipulated period. Mass media channels used by the respondents were radio, television and newspaper; all of them owned radio/ television and 65.0 per cent had the habit of regularly watching agricultural programs. Regarding newspapers, it was observed that 75 per cent were regular subscribers of newspapers; 91.70 per cent were found to be regular or occasional readers.

Majority of the respondents (85%) are members of any formal, statutory or social organizations such as agricultural credit society, self-help group, village panchayat farmer's association and farmers discussion group and hardly 13.33 per cent of the respondents were office bearers and only one respondent was not a part of any organization.

Mobile phone usage and information needs through mobile app :

Period of using mobile phone: Perusal of survey results indicated that 90 per cent of the respondents were using mobile phones for the last 5-10 years followed by 6.67 per cent who were using mobile phones for less than five years. Hardly 3.33 per cent of the respondents were using mobile phones for more than 10 years.

Source of information about mobile phone: Almost

half of the respondents (43.33%) came to know about mobile technology from their friends followed by their neighbors/relatives (35%). Advertisements seen in mass media like television, newspapers and magazines were also another source of information for 15 per cent of the respondents to know about mobile phones and 6.67 per cent got to know about mobile phones through their children.

Mobile usage pattern: In contemporary society today, mobile phone is the most commonly used channel of communication. Irrespective of the age, education, land possession, social class, occupation etc. they possess mobile phones based on their purchasing power.

Majority of the respondents (88.33%) use mobile phone with internet access and only 11.67 per cent were not having accessing to internet but they were using smart phones. This indicates that internet usage is on the increase among cane growers. However, the purpose of using mobile phones varied widely and is detailed in Table 1.

All the respondents got the mobile phone to communicate with their family members, relatives and friends. They were using mobile phones to disseminate information related to family matters. They widely use mobile phones to share information on agriculture but quite often used for business talks as expressed by 96.67 per cent of respondents. Most often they discussed among themselves on various agriculture related activities on the crops they grow as well as the availability of setts or seedlings for planting; this implies that farmers have realized the importance of healthy planting material and mobiles ease to get information. One-third of the farmers reported that they receive information on weather parameters from

Table 1. Purpose of mobile usage by sugarcane farmers (N=60)

Purpose of using mobile app	No.	%	Rank
To communicate with family and friends	60	100	I
To discuss among fellow farmers about different agriculture related matters	58	96.67	II
To enquire about the availability of sugarcane setts / seedlings for planting	58	96.67	II
To contact input dealers about the availability of inputs	56	93.33	III
To receive information on weather parameters	40	66.67	IV
Price information of agricultural produce from friends / neighbors	38	63.33	V
To communicate directly with market brokers and customers to sell agricultural products in good prices	36	60.00	VI
To receive voice messages on sugarcane	32	53.33	VII
To contact veterinary officers to get information about diseases in cattle and their management	12	20.00	VIII

the agriculture department. They also communicate over mobile phones to contact middlemen and market brokers and consumers to sell their farm produce in a remunerative price. Voice messages are also being sent by sugar mills and Krishi Vigyan Kendras as reported by over half of the farmer respondents. In general, cattle management is by using traditional practices or from neighbours and other villagers and hardly one-fifth contacted local veterinary officers in their mobile. Whatever be the cause, mobile phone usage in on the rise and this opportunity can be utilized to transfer agricultural technologies.

Information required through mobile app: Every respondent had his / her own information requirement on sugarcane cultivation aspects through mobile apps and is given in Table 2.

Any social media platform to be used for education should be based on the needs of the intended users as expressed by them. An open-ended schedule was developed to get the information needs of sugarcane farmers on the contents they need to be obtained in a mobile app. The most important information need was on fertigation schedule, maintenance of drip irrigation system and mechanization to overcome labor problem. Farmers in the study sample are rarely into the practice of applying fertilizers based on soil testing, which is the recommended practice. Every State Agricultural University has its recommended schedule of fertilizers

and farmers had requested the schedule to be given in the app with an option to scroll down the menu and choose the state.

Given the shortage of water for irrigation and the subsidy being given by the government to promote micro irrigation, many respondent farmers have adopted drip irrigation. They are unaware of the type of fertilizers, quantity of fertilizers to be applied for sugarcane and the time of application and hence the necessity of obtaining such information through their mobiles that would serve as a handy reference.

Labor is another limiting factor in sugarcane production and quite often labor is unavailable and even if available, it is unaffordable. In this context, the respondents have realized the importance of introducing machines for the various agricultural operations in sugarcane and were in need of information on the machineries suited for sugarcane crop.

The respondents were also in need of information on the identification of the pests affecting sugarcane crop, symptoms caused and the management measures; also, on the various diseases infecting the crop, symptoms caused and the available management measures. Varieties are the pivot around which the whole sugarcane crop and sugar industry revolves. Farmers have realized this and had asked for a means to select the best suited sugarcane variety for their region along with the optimum season of planting and

Table 2. Distribution of respondents based on information required through mobile app (N = 60)

Items needed in the mobile app	Mean	SD
Varieties best suited to their area	4.40	0.519
Complete package of practices	4.39	0.516
Know-how to identify sugarcane pests	4.36	0.521
Management measures for pests infesting sugarcane	4.41	0.522
Ways to identify sugarcane diseases	4.38	0.523
Management measures for sugarcane diseases	4.47	0.524
Information on weather parameters	3.87	0.896
Links to related websites	4.02	0.881
Market related information	4.01	0.856
Price of various agricultural inputs	3.98	0.986
Availability of inputs in each district	3.72	0.895
Address of input dealers in the vicinity	3.78	0.652
Information on Sugarcane Research Stations	4.49	0.554
Continued guidance from planting to harvest	4.50	0.529
Information to be provided in their local language	4.48	0.527
Benefits of drip irrigation	4.46	0.533
Fertigation schedule specifically for each district	4.56	0.539
Guidance for maintenance of drip irrigation system	4.53	0.527
Mechanization to overcome labor problem	4.51	0.530

Table 3. Perceived benefits of information delivery through mobile app (N=60)

Perceived benefits	No.	%
Easy to handle through mobile phone	55	91.67
Access to information any time	60	100.0
Time saving as we can get the information at home itself	60	100
Reduces travel time and expense	51	85.00
Information can be stored in mobile and referred as and when needed	59	98.33
Reliable information as it comes from a Research Centre	59	98.33
Can get to know the latest valuable information	58	96.67
Easy to store information in the mobile phone	60	100.0
Can repeatedly browse the information	60	100
Can read the text and see the images as well	54	90.00
Enables farmers to get current information on availability of inputs if linked to such services	47	78.33
Serves as a communication channel with extension workers and input dealers	49	81.67
Can provide early warning on disaster and risk management	41	68.33
Tailor-made information can be provided to registered users of mobile apps	36	60.00
Access to get replies to queries raised by individual users	32	53.33

the details of the selected variety with images.

The respondents of this study have also asked for information on the Sugarcane Research Stations available in their vicinity with contact details so that they can get guidance on cane cultivation from the respective Sugarcane Research Stations. On an equal note, the cane growers had expressed their need to get continued guidance from planting to harvest either through short message service or voice calls. Also, the respondents had expressed their need to get the entire information in their own local language.

The other details asked for in their order of importance include weather information, market information, price of inputs and details on input dealers.

Perceived benefits of information delivery on sugarcane through mobile app : Mobile phones, being a mode of social media with contemporary importance have its own advantages. The advantages perceived by the farmer respondents of the study are listed in Table 3.

The major benefits as perceived by all the respondents of the study are access to information any time, time saving as we can get the information at home itself, information can be stored in mobile and referred as and when needed, easy to store information in the mobile phone and can repeatedly browse the information.

As high as 98.33 per cent reported that such mobile apps can help them get reliable information as

it comes from a Research Centre and 96.67 per cent reported that they can know the latest information through real time mobile apps. The other positive outcomes of using mobile apps include easy to handle information through mobile phones than lap tops and desktops, and can read the text and see the images as well. Also, mobile apps can serve as a communication channel with extension workers and input dealers and get them get timely information. However, literacy is a limiting factor to read and comprehend and in the study sample as well there were respondents who had limited literacy.

Possible constraints involved in using mobile phones and mobile app : Though there are myriad ways in which mobile phones and its usage is seen as a boon to mankind, it's not without a negative side. The major constraints as perceived by the sample farmers are listed in Tables 4.

All the respondents felt the necessity to carry the mobiles always, has to be charged quite often as it would run out of battery, fear of theft of mobile sets and all the information stored is lost if the mobile phones are lost. As days pass on, smart phones and mobile phones get expensive and sometimes are unaffordable. Nearly one-third of the respondents have realized the crude fact that with increased use of mobile phones, they have slowly started losing human touch to the relations. All the needed activities are done over a phone call dispensing the need to physically go to a place, talk to a person and get it

Table 4. Constraints involved in using mobile phones and mobile app (n = 60)

Items	No.	%	Rank
<i>Constraints involved in using mobile phones</i>			
Smart phones are quite expensive	45	75	II
We are not used to mobile phones	4	6.67	IV
Need to carry the phone always	60	100	I
Has to be charged quite often	60	100	I
Personal human relations are lost after mobile phone usage	39	65	III
Fear of theft of mobile phones	60	100	I
All the information and contracts get lost if mobile phones are missed	60	100	I
<i>Constraints involved in using mobile apps</i>			
Internet connection is needed for mobile apps	60	100	I
Slow internet connectivity	60	100	I
Have to recharge for internet connection	60	100	I
Have to wait to get replies for queries	35	58.33	V
Many unreliable apps are available from many sources	60	100	I
Need training on the usage of mobile apps	58	96.67	II
Many apps are not available in local languages	56	93.33	III
Messages in mobile app are sometimes theoretical	54	90.00	IV

done. Hence, mobiles are at a disadvantage when it comes to interpersonal human relations.

Though many farmers own a mobile phone, the use of internet through these phones is still a question. For many respondents, mobiles are seen as just a channel of communication. When it comes to using mobile apps for educational purpose, the major constraints experienced by all the respondents are internet connection is needed for using mobile apps, slow internet connectivity and have to recharge for internet connection. Also, they opined that many unreliable apps are available, not available in local languages and the messages in the mobile apps lack practicability and 58.33 per cent reported that they have to wait to get replies from the developers or the Research Centres for their queries. However, it is a positive sign that the respondents have a good sureness in the mobile apps and they see it as a platform to send their queries and get the desired information from the source of the message.

CONCLUSION

Deficits in physical infrastructure, problems with availability of agricultural inputs and poor access to agriculture-related information are the major constraints on the growth of agricultural productivity in developing countries (Lukman *et al.* 2022). The

more rapid growth of mobile telephony as compared to fixed line telephony and the recent introduction of mobile- enabled information services provide a means to overcome existing information asymmetry in a long duration crop like sugarcane. The diversity of agro-ecological situations, varied technologies recommended and needs of sugarcane farmers further mount to this challenge (RajulaShanthi *et al.* 2020). The study found evidence that mobiles are being used in ways which contribute to productivity enhancement. However, to leverage the full potential of information dissemination enabled by mobile services will require significant improvements in supporting infrastructure and capacity building amongst farmers to enable them to use the information they access effectively. As mobile penetration continues to increase among farming communities and information services continue to adapt and proliferate, the scope exists for a much greater rural productivity impact in the future.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

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