

# Usage of Mobile Communication for Sustainable Agricultural Development in Karnataka, India

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## Abstract

*The present study reveals the access of mobile technology for sustainable agriculture development in Karnataka. In the context of Indian agriculture, mobile technology has been a vital component in the recent years. The technology helps farmers to obtain updates on the market prices; finance and education, making it possible to monitor resources, track products etc. The Kisan Call Center empowers farmers and people living in rural India with pertinent and high quality information and services through affordable communication network in a sustainable manner. This paper is based on the research study which examined the possibilities and the potential of mobile communication, its style of functioning, services, language and need of farmers, with the help of a structured interview schedule. For collection of data, multi stage sampling technique was used. The study includes four districts in Karnataka state i.e. Koppal, Udupi, Kolar and Bijapur. From each district 45 farmers formed the study sample thus constituting a total sample of 180. The study showed that the maximum number of farmers use mobile phones to get information regarding seeds and crops, plant protection measures for pest and disease control etc. The study also identified that mobile technology is a credible source in disseminating information on sustainable agriculture to farmers.*

**Key words:** *Mobile communication technology, farmers, sustainable agriculture, development, information.*

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## INTRODUCTION

In India agriculture has a long history that goes back to ten thousand years. At present, in terms of the **agricultural production**, the country stands second in the world. Sustainable agriculture refers to a range of strategies for addressing the varied problems that affect agriculture. Such problems include loss of soil productivity from excessive soil erosion and associated plant nutrient losses, surface and ground water pollution from pesticides, fertilizers and sediments, impending shortages of non-renewable resources, and low farm income from depressed commodity prices and high production costs. Furthermore, “sustainable” implies a time dimension and the capacity of a farming system to endure indefinitely (V. Rao et al).

Mobile phones opened up new opportunities for reaching farmers with agricultural information. Farmers were seeking information through the SMS and voice messages and it became an easy task for them to use this medium which was simple. In the context of Indian agriculture, mobile technology has been playing vital role in recent years in reaching out to farmers, who for a long time had no access to technology. Technology provides information to farmers about market prices, weather, finance, and government schemes, making it possible for them to scrutinize resources, track products etc. The *Kisan* Call Center empowers farmers and people living in rural India with relevant information and services through an affordable communication network, in a manner that makes it possible for them to stay in touch with the latest development in the field.

To improve farmers’ access to information, the Karnataka State Agricultural Marketing Board (KSAMB) has also initiated diffusion of market prices free of cost through mobile SMS alerts to farmers. Apart from these, it is also disseminating the same market information using other means such as local newspapers, television, radio, *Kisan* Call Centers and websites like [www.krishimaratavahini.nic.in](http://www.krishimaratavahini.nic.in) and [www.agmarknet.nic.in](http://www.agmarknet.nic.in).

Mobile-based information delivery holds great potential and is either being considered as or is in use as a major channel for sustainable agricultural advisory services. As mobile phone penetration continues to increase among the farming community and information services continue to adapt and proliferate, sufficient potential exists for a much deeper rural productivity impact in the future, but achieving full productivity potential will depend on reducing other constraints which limit the use of information that farmers can obtain through their mobile phones (Mittal and Tripathi, 2009). The

present research aims to throw light at the various possibilities and potential of mobile communication technology, its style of functioning, services, language and needs of farmers.

## **REVIEW OF LITERATURE**

Mittal and Tripathi (2009) stated that the mobile phone can act as a catalyst in improving farm productivity and rural incomes, the quality of information, timeliness of information and trustworthiness of information. These are the three important aspects that have to be given due importance while delivering services to farmers. There exist several constraints that restrict the ability of farmers, especially small farmers that can come in the way of their using technology induced services.

The study by Dhaliwal and Joshi (2010) show that farmers prefer information on marketing and therefore, information takes top rank in the list of their preferences. According to farmers, State Agriculture Universities are the most credible source of information while private agencies are the least. Majority of farmers preferred 2-3 messages per day for fulfilling their information needs. They preferred SMS as the best way of providing information as they can read and save it for its future use. And, farmers in Rural Social System mostly use mobile phones to get information on production.

Kishore, Gupta and Singh (2011) indicate that mobile phone usage is yet to be discovered by the Indian farmers. As merely, 2.29 percent farmers give priority to mobile phones as a source of information, there is a need for orientation to let the farmers know the potential of mobile phones for information sharing and awareness creation.

Furuholt and Matotav (2011) reported that improved access to communication and information through mobile phones has affected the entire cycle of farming life during the year and has brought about considerable change in the livelihood opportunities and has also reduced risk for farmers.

Das, Basu and Goswami (2012) reveal that farmers were mostly benefited from voice mail in adopting to better agricultural practices followed by increased production and revenue, change in cropping pattern and establishing connections to the market.

## **STATEMENT OF THE PROBLEM**

Mobile communication has come to play an important role in the information age. It gives access to information about government plans on sustainable agriculture to large number of farmers. It was, therefore felt necessary to undertake an indepth research study on the “Usage of Mobile Communication Technology for Sustainable Agricultural Development in Karnataka”.

## OBJECTIVES

- To know the access of mobile technology for sustainable agriculture in Karnataka.
- To assess the various possibilities and potential of mobile communication.
- To study the pattern of usage of mobile services keeping in view the needs of farmers.
- To know the impact of quality of service provided by call centers to farmer

## RESEARCH DESIGN

The study was conducted in four zones of Karnataka state during the year January-June 2013. In this study, multi-stage sampling technique was used. The respondents for this study were selected from four districts i.e. Koppal, Udupi, Kolar and Bijapur and from each district 45 respondent farmers were selected for participating in personal interviews. The data were collected through a structured interview schedule. The total sample of the study comprised of 180 respondents. The data were analysed and coded using SPSS software.

## FINDINGS AND DISCUSSION

A socio-demographic profile of the sample respondents is presented in Table-1 under four variables namely gender, age, education and annual income.

**TABLE 1**

Sl no	Gender	f	Percent
1	Male	161	89.4
2	Female	19	10.6
	<b>Age</b>		
1	Below 35 years	67	37.2
2	36-45 years	91	50.5
3	46 years and above	22	12.2
	<b>Education</b>		
1	Illiterate	8	4.4
2	Primary/secondary	86	47.8
3	PUC/Diploma	52	28.9
4	UG/PG	34	18.9
	<b>Annual Income</b>		

1	Up to Rs. 10,000	2	1.1
2	10001-20000	82	45.6
3	20001-30000	20	11.1
4	30001-40000	41	22.8
5	< 40000	35	19.4

N=180

***Socio-Demographic Profile***

**Gender:** The data relating to gender show that the majority of the subjects (89.4%) were male. The usage of mobile phone by women seems to be at very low ebb. This finding is consistent with these of studies by A. E. Agwu, J. N. Ekwueme and A. C. Anyanwu (2008), Ani, A.O and Baba, S.A (2009), Nwachukwu, C. A., (2010), Ayoade A.R (2010) .

**Age:** An analysis of the age composition of the respondents reveal that little more than half (50.5%) were in the age group 36 - 45 years, where 37.2 percent of subjects were below the age of 35 years, a small percent, i.e., 12.2 percent were above 45 years. The results are in consonance with the findings of Xu Guanren (1989), Nataraju and Perumal (1996), KrishnaMurthy A.T (1999) and Barman and Gogoi (2000) which upheld that majority of the farmers were in their middle age.

**Education:** Data on education indicate that nearly half of the respondents (47.8%) had received primary or secondary education. While 28.9 percent of the respondents had +2 or diploma level education, and 18.9 percent had college degree. Only 4.4 percent of the respondents were illiterate. The educational attainment seems to be related to the availability of better educational facilities in the study area. The results are in conformity with the findings of Rehman Fariha (2011) and Olajide B. Rasak and Amusat A. S. (2012).

**Annual Income:** The data related to annual income point out that majority of the subjects had an annual income ranging from Rs.10, 000 to 20,000. Those who earned an annual income ranging between Rs. 20,001 and 30,000 and 30,001 and 40,000 were 11.1 percent and 22.8 percent respectively. 19.4 percent had an annual income of more than Rs. 40,000. A study on similar lines by Hosamani (2009) showed that 53 percent of the respondents had annual income more than Rs 11,500.

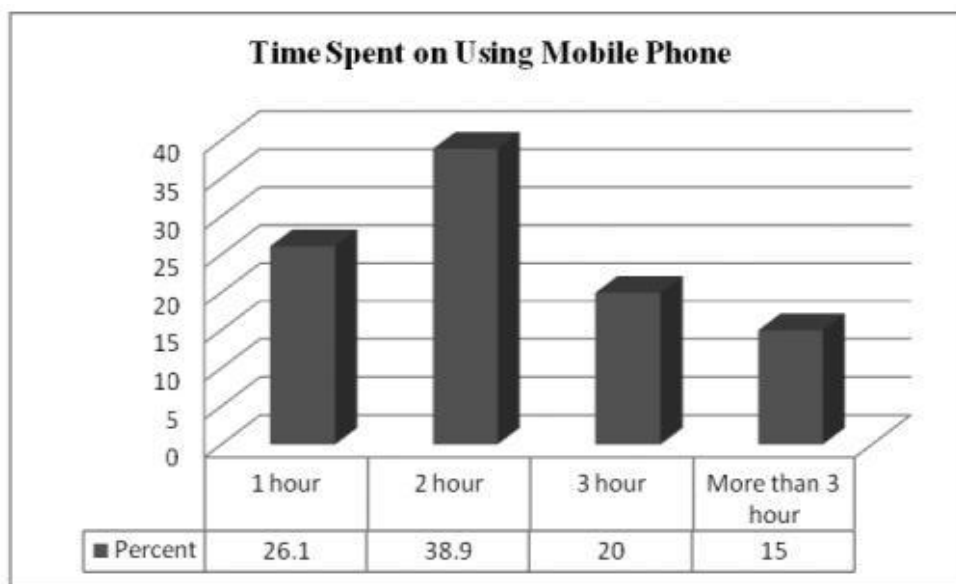
From among 180 subjects, it was seen that 68.8 percent used 2G mobile phone and the remaining (31.11%) used 3G phone.

The data relating to the time spent on using a mobile phone are given in Table 2.

**TABLE 2**

SI No	Duration	f	Percent
1	1 hour	47	26.1
2	2 hour	70	38.9
3	3 hour	36	20.0
4	More than 3 hour	27	15.0
5	Total	180	100.0

**N=180** *Time Spent On Using Mobile Phone*

**Graph-1**

The analysis of data pertaining to the time spent on mobile phone show that most of the respondents (38.9 %) spend 2 hours a day using their mobile phone, whereas, 26.1 percent spend an hour a day. 20 percent and 15 percent spend 3 hours or more than 3 hours a day respectively.

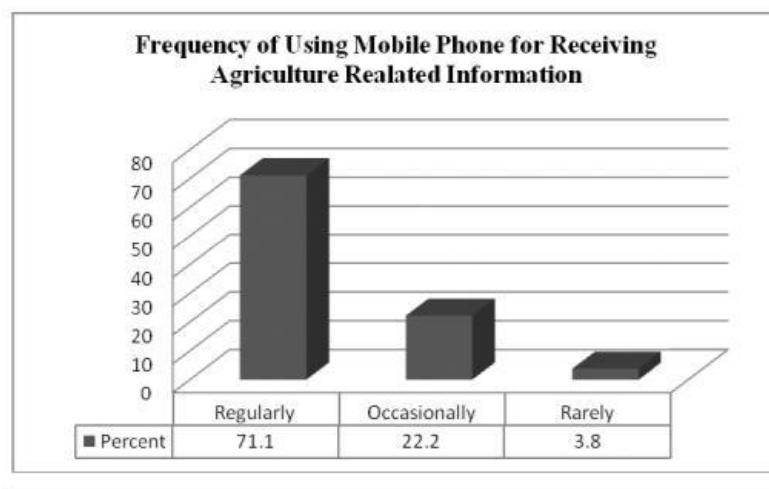
**Table 3**

The data in Table 3 show the frequency of usage of mobile phone for obtaining agriculture related information.

Sl.No.	Frequency	f	Percent
1	Regularly	128	71.1
2	Occasionally	45	22.2
3	Rarely	07	3.8
4	Total	180	100.0

**N=180 Frequency of Using Mobile Phone for Agricultural Information**

**Graph-2**



It is seen that the majority 71.1% use the mobile phone regularly for the purpose of agriculture followed by 22.2% who use it regularly and 3.8% who use it rarely. Table 4 contains data on the type of information received through mobile phone.

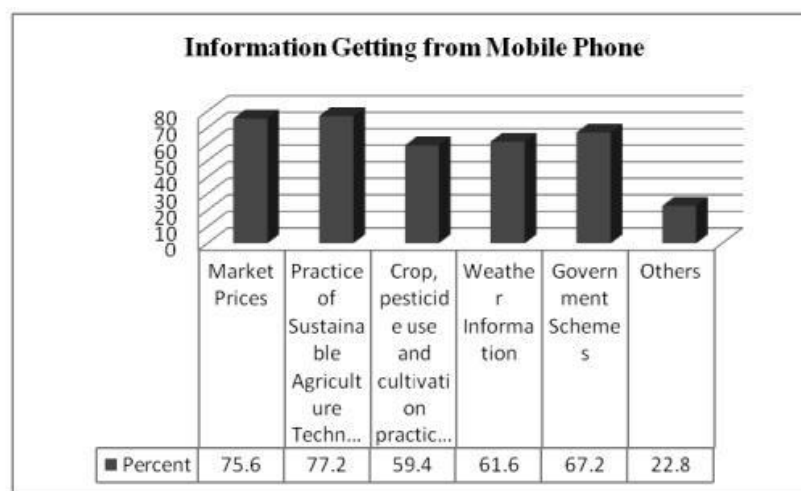
**Table 4**

Sl no	Type of information	f	Percent
1	Market Prices	136	75.6

2	Practice of Sustainable agriculture technology	139	77.2
3	Crop, pesticide use and cultivation practices	107	59.4
4	Weather Information	111	61.6
5	Government Schemes	121	67.2
6	Others	41	22.8

**N=180 Type of Information Accessed from Mobile**

**Phone Graph-3**



The information in the table 4 indicates that the farmers use the mobile phone for receiving a rather wide variety of information. For every type of information indicated in the table the usage ranges between 60-70 percent. However, the most sought after areas seem to be information relating to market prices (75%), sustainable agricultural practices (77.2%), government schemes (67.2%) and weather information (61.9%). Studies by Mittal and Tripathi (2009) showed that most of the farmers sought information regarding seeds and market price was the second most sought.

According to Table 5, it was seen that besides the mobile phone, farmers also sought agriculture related information from other sources.

**Table 5**

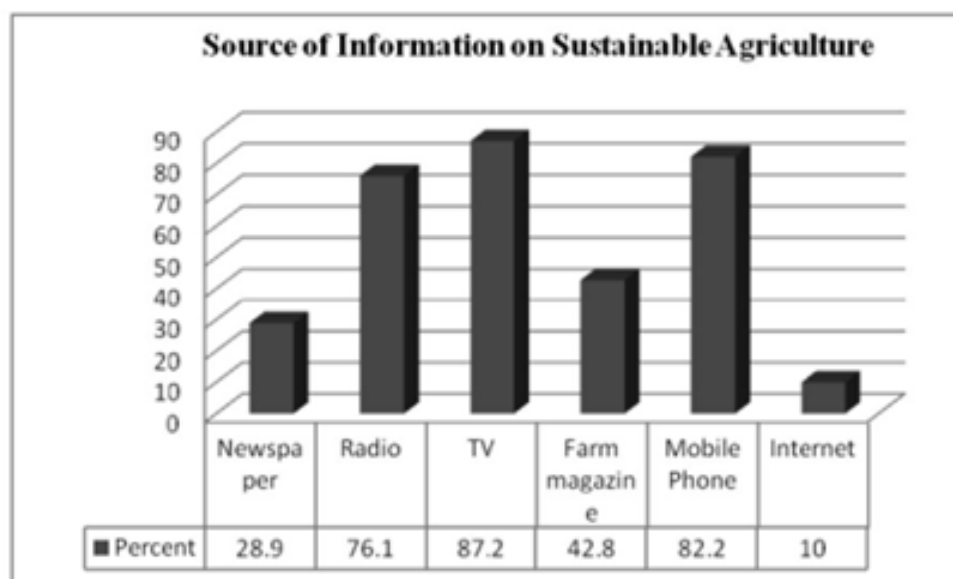
Sl.no	Sources of information	f	Percent
1	Newspaper	52	28.9



2	Radio	137	76.1
3	TV	157	87.2
4	Farm magazine	77	42.8
5	Mobile Phone	148	82.2
6	Internet	18	10.0
7	Krishi Vigyan Kendra	78	43.3
8	Kisan Call Center	58	32.2
9	Others	5	2.8

N=180 Sources of Information on Sustainable Agriculture

Graph-4



Besides the Mobile phone (82.2%) it is seen that the most popular information sources were television (87.2 %) and radio (76.1%). The other information sources were *Kisan Vigyan Kendra* (43.3%), *Kisan Call Centre* (32.2%) and Internet (10.0%). Though a very small percentage, it is interesting to note that farmers have started using internet.

Table 6

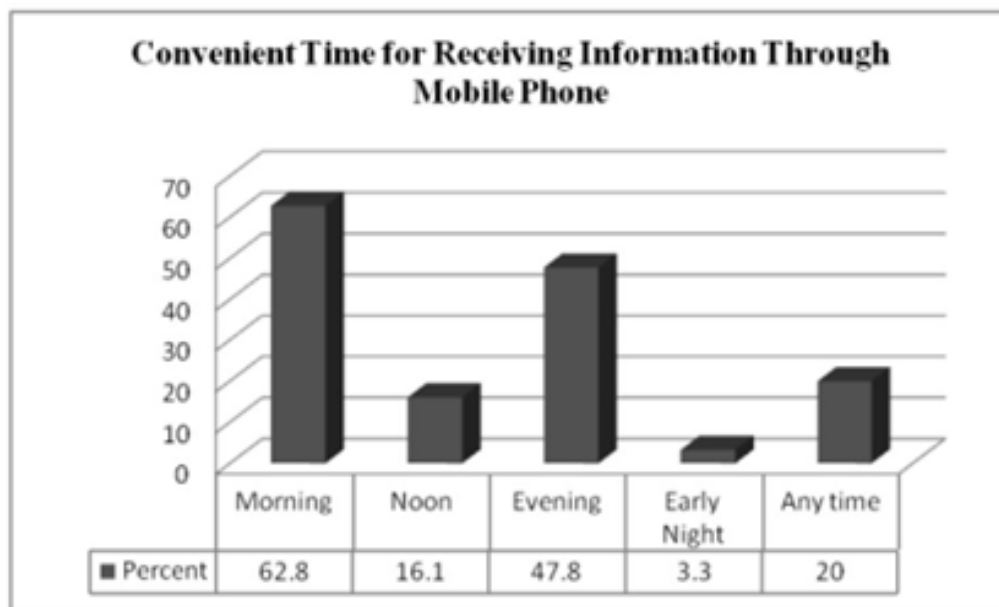
Table 6 contains data on the time that farmers consider suitable for using mobile phone.

Sl no	Time	f	Percent
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1	Morning	113	62.8
2	Noon	29	16.1
3	Evening	86	47.8
4	Early Night	6	3.3
5	Any time	36	20.0

**N=180**

**Graph-5**



The data in table 6 showed that more than half of the respondents (62.8 %) preferred morning, followed by 47.8 percent who said they preferred the evenings. Those who were ready throughout the day and in the afternoon were 20 percent and 16.1 percent respectively. Only 3.3 percent preferred night time.

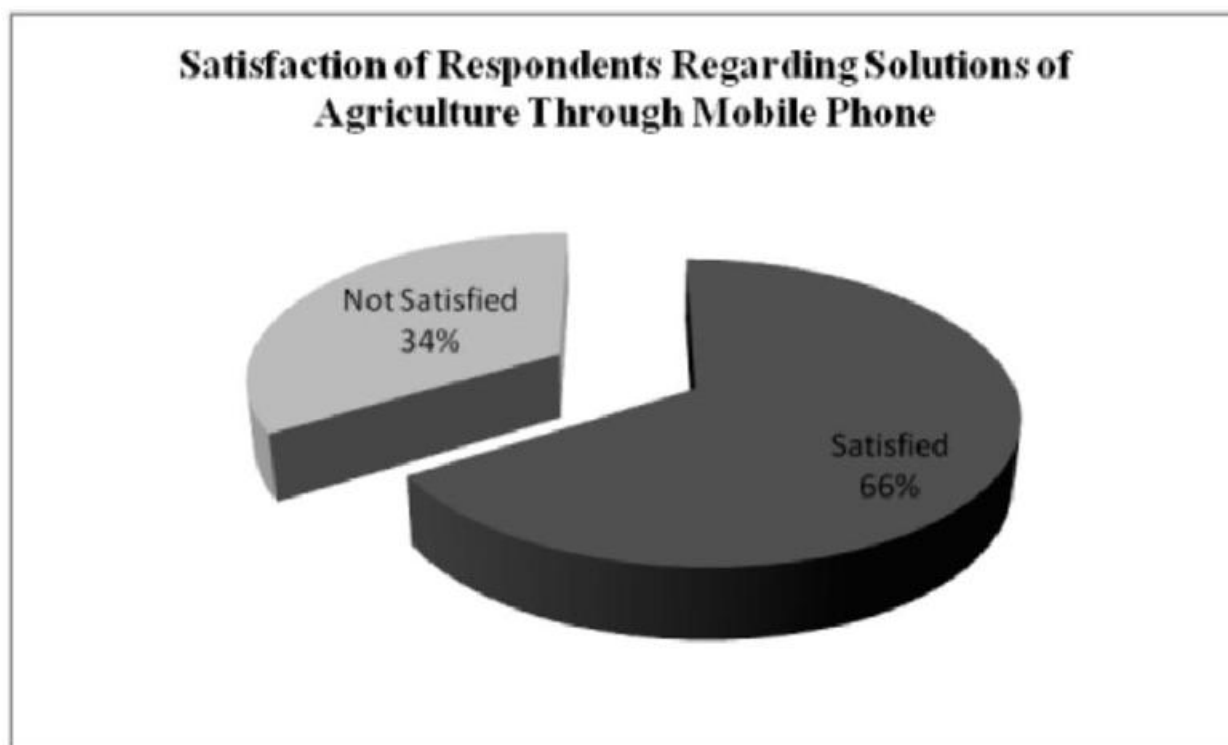
**TABLE 7**

**Satisfaction about the Information Received Through the**

**Mobile Phone**

Sl. No.	Opinion	Frequency	Percent
1	Satisfied	119	66.1
2	Not Satisfied	61	33.9
	Total	180	100.0

N=180

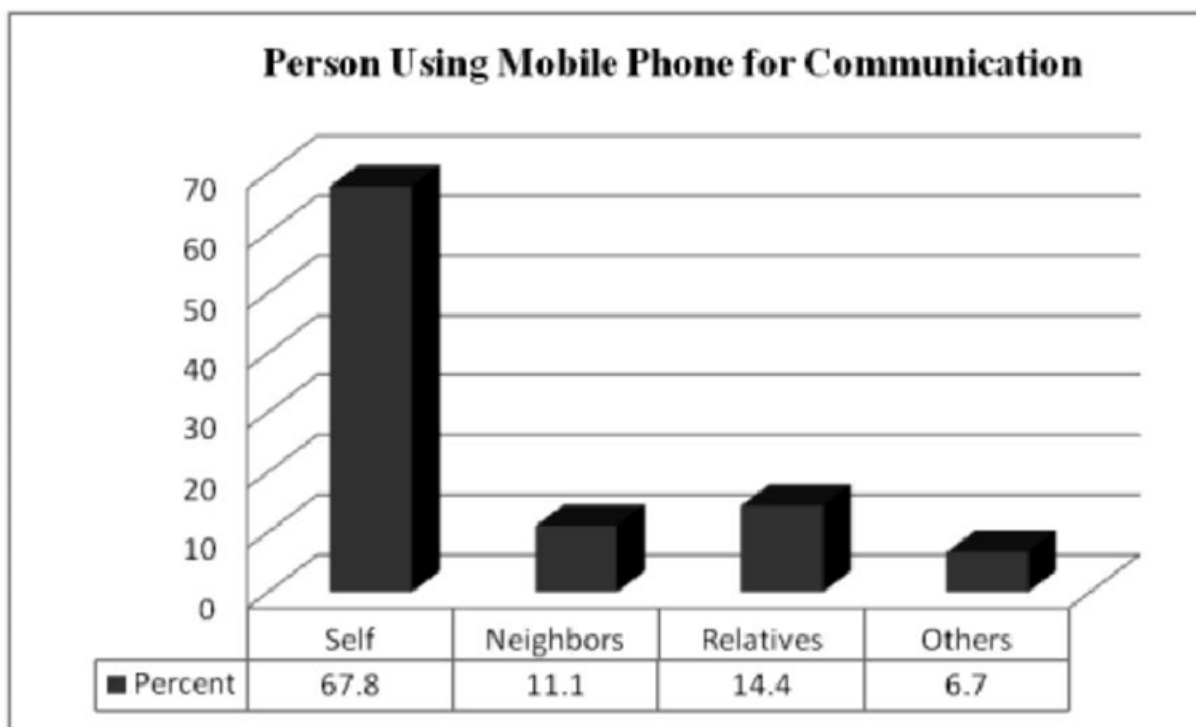
**Graph-6**

For question related to the solutions they received by using the mobile, the farmers replied either in the affirmative or negative. The answers are shown in Table 7. From the data it could be seen that the majorly (66.1%) were satisfied with the solutions that they received for agriculture related questions. Those who replied in negative were 33.9 percent.

**TABLE 8****Persons Using Mobile Phone for Communication.**

Sl. no.	f		Percent
1	Self	122	67.8
2	Neighbors	20	11.1
3	Relatives	26	14.4
4	Others	12	6.7

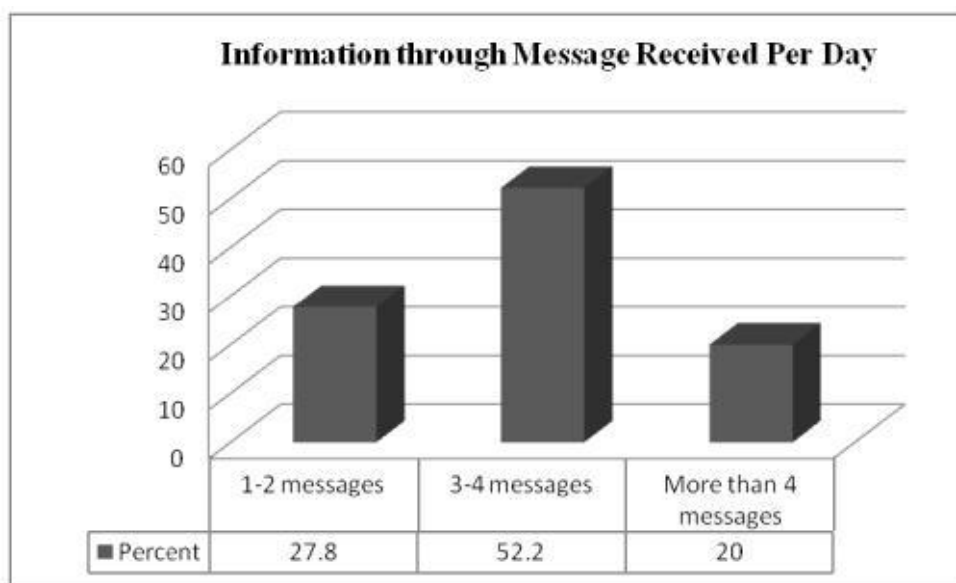
N=180

**Graph-7**

The respondents were asked if they personally sought agriculture related information using the mobile or depended on others. The answers show that majority of the respondents (67.8%) used the mobile phone to contact experts on matters relating to sustainable agriculture. Relatives (14.4%), neighbors (11.1%) and others (6.7%) were alternative sources of information on agriculture.

**TABLE 9****Information through Messages Received Per Day**

SI No	Messages	f	Percent
1	1-2 messages	50	27.8
2	3-4 messages	94	52.2
3	More than 4 messages	36	20.0
	Total	180	100.0

**N = 180****Graph – 8**

Besides direct contact the SMS mode was also used by respondents to receive information on agriculture. The number of messages ranged from more than 4 to 1 or 2 messages. The majority (52.2%) received between 3-4 messages per day.

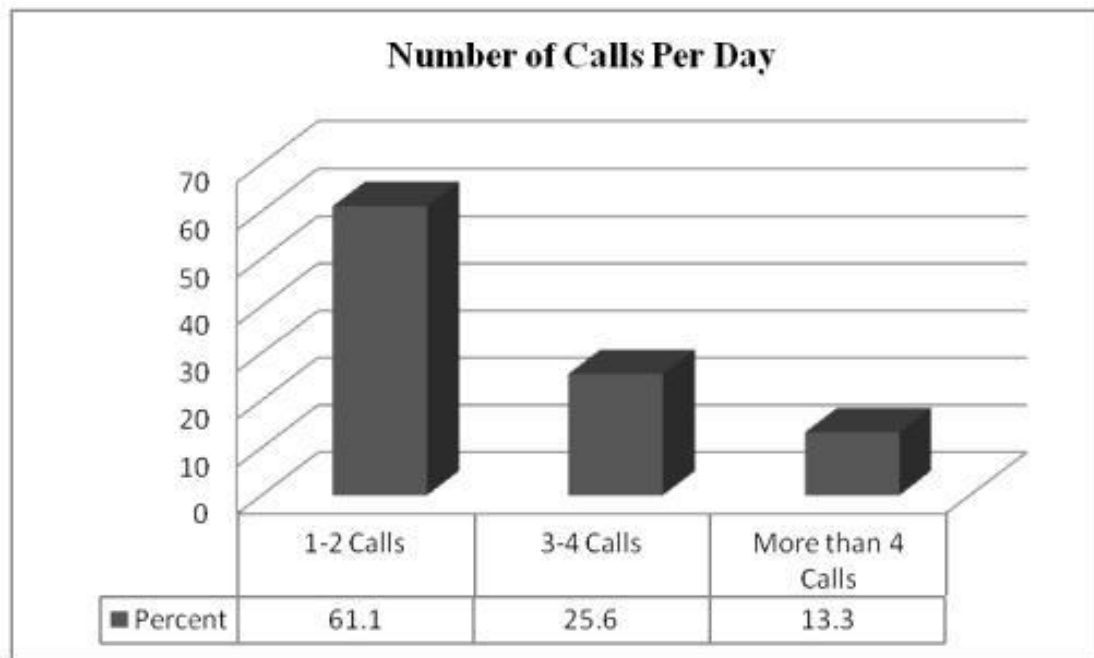
**TABLE 10****NUMBER OF CALLS PER DAY**

Table 10 has data relating to the number of calls that farmers received per day.

Sl no	Call preferred	f	Percent
1	1-2	110	61.1
2	3-4	46	25.6
3	More than 4	24	13.3
	Total	180	100.0

**N=180**

**Graph-9**



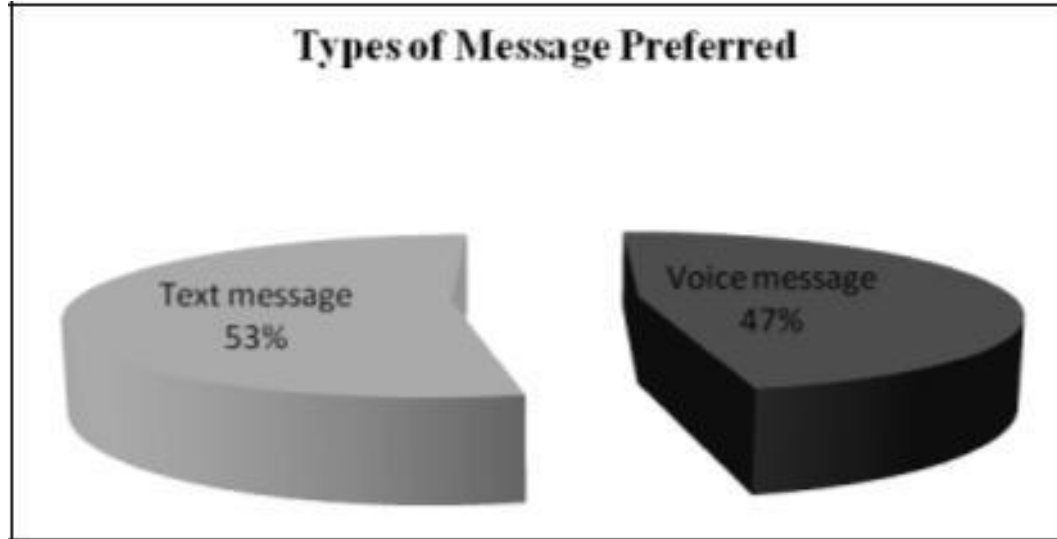
It shows that more than half the respondents (61.1%) received 1-2 calls per day, followed by 25.6 percent who received 3-4 calls and only 13.3 percent received more than four calls per day.

**TABLE 11****TYPE OF MESSAGES PREFERRED**

Table XI has the data relating to their preference of either voice message or text message.

Sl no	Type of message	f	Percent
1	Voice message	84	46.7
2	Text message	96	53.3
	Total	180	100.0

**N=180**

**Graph-10**

The majority preferred text message (53.3%) as against Voice message (46.7%) as it facilitated saving the message for the future use.

**CONCLUSION:**

The study has shown that farmers depend on development mobile communication for receiving and updating their knowledge related to agriculture. Today, mobile phones have started making an impact on sustainable agricultural practice usage. The findings show that mobile phones have distinct advantages as a communication tool in accessing information. Mobile phones help farmers in decision making by providing information regarding sustainable agriculture, seeds and crops, plant protection measures for pest and disease control etc. In this study, majority of the farmers prefer text messages and most of the farmers opined that the mobile phone is very easy to access. They also said that the solutions are through quick replies. While showing that a large number of farmers depend on mobile communication for obtaining agriculture related information, the study indicated a growing tendency towards the use of technology for improving the quality of agricultural productivity.

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