

CERTIFICATE – I

This is to certify that the thesis entitled “**Impact of Kisan Mobile Advisory services in Tikamgarh district of Madhya Pradesh**” submitted in partial fulfillment of the requirement for the degree of **MASTER OF SCIENCE in AGRICULTURE (EXTENSION EDUCATION)** of Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur is a record of the bonafide research work carried out by **Ms. SHRADDHA BHATNAGAR** under my guidance and supervision. The subject of the thesis has been approved by the Student’s Advisory Committee and the Director of Instruction, J.N.K.V.V., Jabalpur (M.P.)

All the assistance and help received during the course of investigation has been acknowledged by her.

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(Dr. Kamini Bisht)

Chairman of the Advisory Committee

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CERTIFICATE – II

This is to certify that the thesis entitled “**Impact of Kisan Mobile Advisory services in Tikamgarh district of Madhya Pradesh**” submitted by **Ms. SHRADDHA BHATNAGAR** to the Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, in partial fulfillment towards the requirements for the degree of **MASTER OF SCIENCE in AGRICULTURE** in the Department of **EXTENSION EDUCATION** has been, after evaluation, approved by the External Examiner and by the Student’s Advisory Committee after an oral examination on the same.

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Declaration and undertaking by the candidate

I, **SHRADDHA BHATNAGAR** d/o **Shri PRAKASH BHATNAGAR** certify the work embodied in the thesis entitled “**Impact of Kisan Mobile Advisory services in Tikamgarh district of Madhya Pradesh**” is my own first hand bonafide work carried out by me under the guidance of **Dr. Kamini Bisht** at Department of **EXTENSION EDUCATION, College of Agriculture, Tikamgarh** during 2014-2016

The matter embodied in the thesis has not been submitted for the award of any other degree/diploma. Due credit has been made to all the assistance and help.

I, undertake the complete responsibility that any act of the misinterpretation, mistakes, errors of fact are entirely of my own.

I, also abide myself with the decision taken by my advisor for the publication of material extracted from the thesis work and subsequent improvement, on mutually beneficial basis, provided the due credit is given, thereof.

Place: Tikamgarh

Signature

Date:

SHRADDHA BHATNAGAR

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Year of thesis submission: **2016**

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Place: _____

(SHRADDHABHATNAGAR)

Dated: _____

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Chapter – I

Introduction

INTRODUCTION

Indian agriculture contributes 17.4 per cent of our GDP and around 55% people derive their livelihood from this sector (Source- CIA, World Fact Book 2015). Rural farmers are producers and consumer also in the food security equation their action, production, harvesting and marketing are critical determinates of global food security. Information plays a critical role at every stage of this action chain. Traditionally, agriculture information exchange was dominated by industrial media such as newspaper, television and magazines. However, introduction of information and communication technologies (ICT) in the field of agriculture has brought many changes in traditional methods of extension. In past few years the usefulness of information and communication technologies especially internet and mobile phones to bridge the gap between scientific know how and field level do how is felt by development agencies throughout the world.

Pioneering ICT experiments in India show that rural livelihood are greatly enhanced by access to information on improved agricultural practices, pest & disease control, market & weather etc. In modern world, information transformation transfer to and from the rural farmers hinges upon the tools of ICT where tele-centers and mobile phones application constitute major part. Since 1990s, telecenters have been experimented with a model to provide ICT opportunities to rural communities including farmers (Barbra and Foote, 2007) Research indicates mobile access has somewhat contribute to the improvements of poor lives and supported poverty reduction (Silva and Zainudeen,2007).

Use of mobile technologies as a tool of intervention in agriculture is increasingly popular. Smartphone penetrations enhance the multidimensional positive impact on sustainable poverty reduction and identify accessibility as the main challenge in harnessing the full potential in agriculture space. Reach of mobile phones even in rural areas extended the ICT services beyond simple voice or text

messages. Kisan mobile advisory (KMA) services is one such initiative of ICT which provide location specific and crop specific farm advisory services and facilities to the farming community in a given area. The KMA services have been provided to the respondent with consultation of expert of different field by the centre.

Statement of problem

Heeks and Molla (2009) found in their evaluation compendium that ICT is not fully utilized in agriculture. Scaling up of delivery, monitoring and evaluation still remains at experimental stage. In the past, emphasis has been placed on the supply side (for e.g. Infrastructurctive building) rather than the demand side (for e.g. farmers willingness and capacity to acquire/use service). Rather than a top-down imposition of infrastructure approach, with little understanding for their ultimate consequences, it is considered there is need to understand the impact of ICT projects at the local context, which can then inform the policy and strategic levels. But the methodologies used to evaluate the impact of ICT on stakeholders communities are still an open issue.

At present the ratio of the farmers to the extension worker is 1000:1 which is really less. The challenges before Indian agriculture are immense. If India is to respond successfully to these challenges and also to achieve accelerated growth there is need to have greater use of modern information and communication technologies. Despite the huge potential to harness ICT for agriculture development, only isolated projects have been tried in Madhya Pradesh like krishivipnan, gyandoot, e-choupal, i-kisan etc.

Kisan mobile advisory had been one among those and worked successfully in disseminating the latest information in the district to the ultimate users. In Madhya Pradesh, the data revealed that 6.0 crore population having 9,00,000 mobile phones (Kumar et al, 2012). Kisan mobile phones had been found very effective tool for faster dissemination of information among different categories of respondents

for making agriculture sustainable in the use of ICT tools like mobile phone. Realizing the importance of Kisan mobile advisory services, some of the researchable questions relevant in this context are:

- What are the socio-personal, economic, communication and psychological characteristics of respondents?
- How are these services utilized by the respondents?
- Is there any impact of services of KMA on respondents/users?
- What are the opinion of KMA users about the services?
- What are the constraints faced by the users to avail the information?
- Is there any influence of background characteristics on indicators of KMA services?

To answers these research gaps, the present study entitled “Impact of Kisan mobile advisory services in Tikamgarh district of Madhya Pradesh” was conducted with the following objectives:

1. To study the socio-personal, economic, communication and psychological profile of respondents.
2. To assess the impact of Kisan mobile advisory services on the respondents.
3. To seek opinion of KMA service users in making services more effective.
4. To find out the relationship between profile characteristics and impact indicators.

Scope and importance of the study:

The study was confined to Tikamgarh block and selected six villages. The findings of the study will be applicable to other areas where similar condition exists.

The knowledge of the findings of this research may also serve as a basis for future studies, who are interested in deeper analysis of the impact of KMA services. Researches done on the impact of Kisan mobile advisory services on the respondents are very limited. The

opinion given by the respondents, would serve as guideline in modifying future development activities and could be taken to improve the advisory services provided to the farmers.

A clear picture of KMA services to the extension personnel would go a long way with respect to easy adoption of innovation in agriculture as well as ICTs in a reasonable short span of time. Further, the findings of the present investigation will then give empirical evidence of the impact of KMA services on the respondents which can be subsequently utilized by the social scientists for undertaking more detailed investigation into its various ramifications.

Limitation of the study:

1. The findings of the study are based on individual research work and may have limited generalization.
2. The study was carried on limited number of respondents (120 respondents). Hence, the findings will not be generalized and is only applicable to the study area.
3. The study was restricted to few variables due to limited time and resources.
4. The major limitation of the investigation was that the significant portion of the findings are based on the expressed responses of the respondents on the basis of re-call memory.

Chapter – II

Review of Literature

REVIEW OF LITERATURE

Review of literature assists in delineation of the problem area and provides a basis for interpretation of empirical perspective of research. With this fact in mind, effort has been made to review the researches, survey reports, books, journals, magazines, popular articles and other sources of information relevant to the study. The collected reviews have been categorized under the following heads:

- 2.1 Socio-personal, economic, communication and psychological profile of respondents.
- 2.2 Impact of Kisan Mobile Advisory services on the respondents.
- 2.3 Opinion of KMA service users in making service more effective.
- 2.4 Relationship between profile characteristics and impact indicators.

2.1 Socio- personal, economic, communication and psychological profile of respondents

Mukhopadhyay and Ramdurai (2001) reported that large farmers received highest amount (91%) of farm information followed by small farmers (57%) and marginal farmers (39%) in decreasing order of information reception. Large farmers' access to different information channels was much higher in contrast to the other categories of farmers.

Sasidhar (2008) reported that majority (63.51%) of the registered farmers of the Backyard Poultry Farm School were middle aged, male (75.7%), belonged to backward (47.3%) and scheduled caste/tribes (31.1%). Majority (66.2%) of the participants' belonged to nuclear families and most of them (44.6%) had occupation as agriculture followed by livestock (28.4%) rearing. All of them were educated and majority (74.3%) of them studied up in middle school and above.

Singh et al (2008) reported that most of the farmers had education up to primary level (34%), 11 per cent farmers were illiterate and 25 per cent were able to read and write. The majority of the farmers of Varanasi and Mirzapur districts of Uttar Pradesh had small to medium land holdings (1 to 1.5 hectares).

Sarvodya Fusion Operation (2009) observed that only 5 per cent farmers interacted with (ICT) tele-centers regarding information.

Chauhan (2010) observed that 64 per cent of the internet facility expecting farmers were from the middle age group, with a high school and higher secondary level of education (45%) and had joint family. Sixty per cent of the respondents belonged to a small category of farmers with mixed farming as a main occupation. In order to earn additional income along with farming about 46 per cent of them possessed two or more animals. More than half of the respondents were found to be the member of one or more organizations.

ICRA Management Consulting Services Limited (2011) reported that majority of the users (73%) were into agriculture for more than past 21 years, less than 50 nalis of land holding and 30 to 45 years of age (34%).

Kumar et al (2012) in their study found that only 5.50 per cent KMA user were made regular contact with the KVK as well as subject matter specialists to discuss the problem of farmers field as well as their solution.

Sandhu et al (2012) in their study indicated that majority of respondents i.e. 56.7 per cent were young (less than 30 years of age), 18 per cent of the farmers belonged to middle age while one fourth (25.3%) were above 45 years of age. As far as education level was concerned, majority of the respondents (65.3%) were of medium category having education between 10th to secondary or having any diploma. Near about one fourth of respondents (22.6%) had high education level while 12.0 per cent belonged to low education category.

Suchiradipta (2012) found that 17.5 percent of the respondents were illiterate but took the help of other family members to read the message they received.

Agrawal et al (2014) indicated that majority of the KMS beneficiaries (57.26%) belonged to the young age group, having education upto high school (47.00%), medium annual income (46.16%), medium size land holding (50.42%) and medium cosmopolite in nature (47.86%).

Kanavi and Jahagirdar (2014) in their study reported that majority of the farmers (67.50%) belonged to middle age group, educated upto pre university education (30.83%), semi medium size of land holding (44.17%), medium level of annual income (43.33%), high extension contact (40.00%), high mass media utilization (40.84%) and medium cosmopolite in nature (44.17%).

Gurjar et al (2015) reported that 61.30 percent of the users of KMA were big farmers followed by small and marginal farmers. Whereas 41.15 per cent of the users of KMA had high level of social participation.

Patra et al (2016) indicated in their study that the majority of respondents (44.00%) belonged to young age group, were male (89.33%), educated upto graduation (30.66%), small size of land holding (50.67%) and had very often social participation (89.33%).

2.2 Impact of Kisan Mobile Advisory services on the respondents

Larose et al. (2001) concluded that the language in which text is presented on a website is an important consideration in India, where there are around 18 and 96 unscheduled languages.

Benigeri and Pluye (2003) reported difficulties in finding, understanding and using the information have been observed to be the most significant barriers preventing people from using web based

information. Finally, lack of access to the internet and its content, diminishes the effectiveness of the communication medium.

Mittal et al (2010) in a study on Socio-economic Impact of Mobile Phones on Indian Agriculture revealed that many of the small farmers said that they benefited from greater convenience, the saving stemmed typically from avoiding local travel and could range from Rs. 100-200 per trip. A small minority said that they had derived greater benefits from the ability to make better decisions about where to sell their output after getting market prices for a variety of local and distant markets.

Saxena et al (2011) observed that 75.86 per cent farmers had received need based scientific information through message. They further found that maximum number of farmers (68%) reported that valuable information on cultivation and related topics via SMS were received by them in a few second just by pressing a key of cell (mobile), while 15.5 per cent respondents stated that the same information also unavailable from other sources. It was found that 82.06 per cent of farmers clearly said that the SMS which they received not only keep them on alert but also reminded the practices at very crucial time and total 69.5 per cent receivers had clearly stated that the KMS has increased their social contact and importance as a resource with credibility & reliability as compared to the other source of information. They also observed that 65.51 per cent farmers expressed their view regarding KMS that it saved the time & money and proper use of various resources and inputs during the cultivation of various crops.

Parganiha et al (2012) stated that as far as the applicability of message is concerned the message was fully applicable for about 40 per cent of KMA members of farm category & message was needful and timely, understandable to 64 per cent of the KMA members and about 68 & 53.33 percent for in-service personnel & input dealers, respectively. They further found that technology imposes high impact on 58 percent of KMS members of farmers category, whereas 72 per

cent and 53.33 per cent members of in-service personnel and input dealers category reported technology impacted highly on them.

Sandhu et al (2012) stated that majority of farmers found agricultural information in the form of SMS through mobile phone as useful (69.3%), comprehensible (74.7%) and timely (64.7%). About 15 per cent farmer who registered for KMAS did not utilize the availed service. About nine per cent of the users could not decode SMS due to language barrier. Lack of the interest of the beneficiary due to excessive length of the content was reported by 12.7 percent of the farmers.

Singh et al (2013) reported that the understanding and application of messages gradually increase due to training, group discussion, mass campaign. As per the feedback and requirement need and time based messages were made available so that they can avail complete use of technology. They further concluded that the impact of the technology was increased from 77.05% to 88.00%.

Kanavi and Jahagirdar (2014) in their study found that 48.33 per cent of farmers indicated as KMAS was moderately useful to them followed by most useful (26.67%) and less useful (25.00%). They further concluded that majority of the respondents belonged to medium and high usefulness because subject areas covered in KMAS are most relevant to them and with good educational background of the farmers they are very much interested in the new technologies disseminated through KMAS.

Kumar et al (2014) stated that advisory through message was needful and timely for 82 per cent of the KMA received farmers and 88.57 and 66.67 per cent for extension personnel and input dealers, respectively however, 15 per cent of farmers, 11.43 per cent of extension personnel and 26.67 per cent of input dealers reported that the message was needful but not timely for them. They further reported that the sent advisory message were medium understandable for 49 per cent of the farmers, followed by highly understandable (82.87%)

and 60 percent of extension personnel and input dealers respectively. Advisory messages were fully applicable for about 42 percent farmers, 80 per cent for extension personnel and 53.33 percent for input dealers. It was found that technology puts high impact on 62 per cent of farmers, 80 per cent and 60 per cent extension personnel and input dealers, respectively.

Kansana et al (2015) reported that almost cent percent farmers were agrees with the statements in received need based information, easy to understand (87.50%), save time and money and increase in social contact (56.25%). They further stated that majority of farmers (72.50%) conveyed the message minimum to another farmer in social system, while 8.75 per cent non-conveyed to more than 3 farmers only 18.75 per cent did not convey the information to others.

Patel et al (2015) concluded that majority of the farmers (72.50%) conveyed the message minimum to another farmers in the social system. They further reported that message were fully applicable for about 44 per cent of KMS members of farmers category, were needful & timely (67.50%) and about 70 & 50 per cent for in-service personnel and input supplier, respectively.

Patra et al (2016) reported that the time specific advisory services (1.68 mean value) had more importance for Kisan Mobile Services followed by weather forecasting (1.61 mean value) and market information (1.58 mean value). They further reported that the farmers were utilizing the mobile services mostly in the field of agronomic practices (2.69 mean value) followed by plant protection measure (2.60 mean value) and input support (2.38 mean value).

2.3 Opinion of KMA service users in making service more effective

Saxena et al (2011) revealed that 50 per cent respondents were in the opinion that the possibility to give feedback has increased as we received message twice a week, while only 17 per cent said that

possibility of giving feedback lies on other sources of information. The finding shows that the KMS programme run by KVK & KVK scientist was very much closed to local situation therefore, the possibility to discuss problem and to solve them with feedback had increased.

Kumar et al (2012) stated that majority of the farmers supported the message in other statements i.e. strong linkage with KVK (96.00%), KMA work as reminder (80.00%), developing information bank (78.00%) and giving feedback (62%), while in case of other statements i.e. easy to understand (50.00%), increase social contact (52.00%) and save time & money (50.00%) farmers given their average opinion/ agreement about these statements. Eighty five per cent of farmers have demanded sandesh should be in hindi language instead of roman English.

Patra et al (2016) observed that the majority of the farmers opined that the time specific advisories are most important followed by weather forecasting and market information. The message on agronomic practices are most suitable followed by management of disease & pest are found to be most suited as per the result. They preferred to serve the message on local language.

2.4 Relationship between profile characteristics and impact indicator

Warren et al (2000) reported that although the adoption of ICT in horticultural production is recognized as a problem, researched that ICT adoption was very scarce. It was found that adoption of ICT was strongly associated with the education level of the farmer and farm size. The impact of age is not so clear. However, some researchers found a negative effect of age on ICT adoption.

Agrawal et al (2014) indicated that there exists a significant relationship between all independent and one dependent variable i.e. knowledge in agricultural information dissemination.

Chapter – III

Material and Methods

MATERIAL AND METHODS

This chapter deals with the methods and procedures used for the study. The different steps that were undertaken are listed below and the details under each step are explained in the succeeding part of the chapter. This chapter has been divided into the following sub heads:

3.1 Sampling techniques used

- 1) Locale of the study
- 2) Selection of the block
- 3) Selection of the villages
- 4) Selection of the respondents

3.2 Selection of variables, definitions, measurements, scoring procedure.

3.3 Sources, Instrument and methods of data collection.

3.4 Processing and statistical analysis of data.

3.5 Validity and Reliability of instruments.

3.6 Hypothesis of the study.

3.1 Sampling technique used:

1) Location of the study:

The study was conducted in Tikamgarh district of Madhya Pradesh. Tikamgarh district lies between latitude 24°26' and 25°34' North and longitude 78°26' and 79°21' East. The district population is 1,445,166 out of which 760,355 are males and 684,811 are females (2011 census). The average density of the population is 286 per sq. km. The total geographical area of the district is 5048 sq.km.

There are two important agriculture seasons viz., kharif and rabi and main crops grown are soyabean, wheat, gram and pulse and oilseeds (Statistical Office, Tikamgarh, 2009-10). The district has been divided

into 9 tehsils namely Tikamgarh, Baldeogarh, Palera, Niwari, Prathivipur, Jatara, Mohangarh, Orcha, and Khargapur, and 6 blocks namely Tikamgarh, Baldeogarh, Palera, Niwari, Prathivipur, and Jatara.

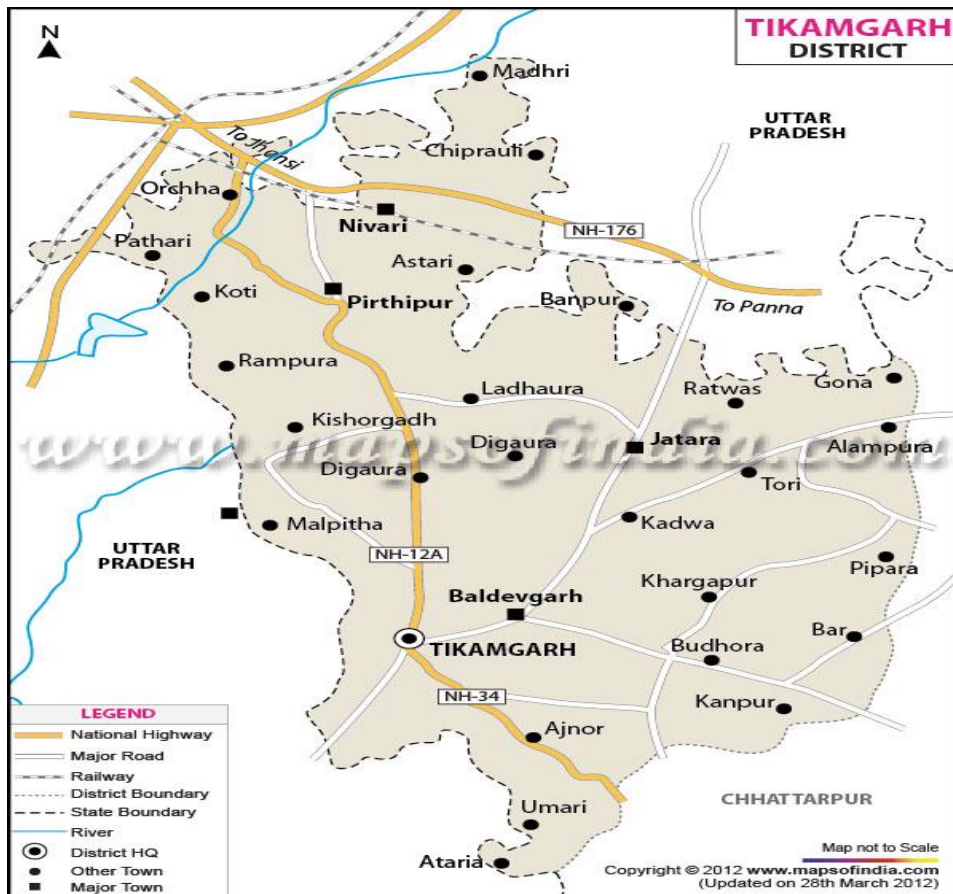


Fig.1 MAP OF TIKAMGARH DISTRICT

(Source:<http://www.mapsofindia.com/maps/madhyapadesh/districts/tikamgarh.htm>)

The population of Tikamgarh block is 3,01,714 which consist of 2,02,917 rural and 98,797 urban population. There are 174 number of villages in Tikamgarh block.

(Source Census 2011, Tikamgarh.nic.in/stats.htm).

2) Selection of blocks:

Tikamgarh district comprises of six blocks i.e. Tikamgarh, Niwari, Prathvipur, Baldevgarh, Palera & Jatara. Out of 6 blocks, only one block viz. Tikamgarh was selected purposively as the maximum

number of registered farmers were availing the KMA services provided by KVK, Tikamgarh.

3) Selection of villages:

From Tikamgarh block, six villages were selected as the respondents availing KMA services belonged to those six villages. The selected six villages were Kanti, Heeranagar, Madumar, Bawri, Anantpura and Lar.

4) Selection of respondents:

From the list provided by KVK, Tikamgarh, total 120 respondents were selected randomly using simple random sampling method.

3.2 Selection of variables, definitions, measurements, scoring produce and categorization:

Variables and their measurement

Independent variables:		
S.No.	Variables	Measurement
a.	Socio- personal, economic variables:	
1.	Age	Chronological age(in completed years)
2.	Gender	Male/Female
3.	Education	Schedule was developed
4.	Land holding	In acres
5.	Annual income	In rupees
6.	Farming experience	In years
7.	Material possession	Self scoring
8.	Social participation	Direct questioning
b.	Psychological variable	
9.	Innovativeness	Scale of Moulik (1965) was used
10.	Scientific orientation	Scale of Supe (1969) was used
c.	Communicational variable	
11.	Mass-Media	Schedule was developed

	Exposure	
12.	Extension contact	Schedule was developed
Dependent variables:		
1.	Impact of KMA Services	Index was developed

3.2.1 Operational definition of variables:

3.2.1.1 Independent variables

1. Age:

Age was operationalized as the number of years an individual has completed at the time of interview and was measured as per actual chronological age of an individual. The categories developed were:

S.NO.	Categories	Characteristics
1.	Young age	(less than 26)
2.	Middle age	(26 to 50)
3.	Old age	(More than 50)

Mean= 38.50833

S.D.= 12.56847

2. Gender:

It refers to the differences in man and woman in terms of role and status in society, values, attitude and other socio-psychological variables. It was categorized in two categories and scores of 2, 1 was given accordingly as under:

S.NO.	Categories	Scores
1.	Male	2
2.	Female	1

3. Education:

It refers to the formal education attained by an individual. All the respondents were classified into seven groups according to the number of years of their formal education.

S.NO.	Categories	Scores
1.	Illiterate	0
2.	Can read and write	1
3.	Primary	2
4.	Middle	3
5.	High school	4
6.	Higher secondary	5
7.	Graduation or more	6

4. Land holding:

It was operationalized as the size of the farm which the farmer has actually put into cultivation. The data were collected by asking respondents about the area under irrigation, leased in land, leased out land and total operational holding. In the present study the criteria laid by the National Commission on Agriculture (NCA), Government of India (GOI) were followed to classify the respondents in following categories:

S.NO.	Category	Characteristics
1.	Small farmers	2.51 to 5.0 acres
2.	Medium farmers	5.01 to 10 acres
3.	Large farmers	Above 10.01 acres

5. Annual income:

It refers to the annual income of respondents through all sources, and was categorized into low, medium and high on the basis of mean and standard deviation:

S.NO.	Categories	Scores
1.	Low income (<Rs.22485)	0
2.	Medium income (Rs.22485-75948)	1
3.	High income (>Rs.75948)	2

Men= 49216.66

S.D.= 26731.52

6. Farming experience:

It refers to the involvement of an individual in farming activities in terms of number of years, and was categorized into three categories i.e. low, medium, and high on the basis of mean and standard deviation:

S.NO.	Categories	Scores
1.	Low (Upto 10 years)	0
2.	Medium (10 to 32 years)	1
3.	High (Above 32 years)	2

Mean= 21.37

S.D.= 11.34

7. Material possession:

The information with regard to the important non-agricultural material possessed by the respondent's family was obtained and the same was expressed in three categories as high, medium, and low on the basis of mean and standard deviation.

S.NO.	Categories	Characteristics
1.	Low	Less than 4
2.	Medium	Between 4 & 8
3.	High	More than 8

Mean= 4.67

S.D.= 2.41

8. Social participation:

It refers to the degree of involvement of the respondents in any formal and/or informal social organization as a member or office bearer. The respondents were assigned a score of '0' for having membership and '1' for office bearer for each of the social organization/ institution separately. For extent of participation ,a score of '0' for low,'1' for medium and '2' for high level of participation in the social organization/institution was assigned. Accordingly, on the basis of mean and standard deviation, the respondents were categorized into three categories viz. low, medium and high.

S.NO.	Categories	Scores
1.	Low	0
2.	Medium	1
	High	2

9. Innovativeness:

It is the degree of frequency of contact by which an individual adopts new idea or technology relatively earlier than others in his social system. It was measured with the help of scale developed by Moulick and Rao (1965). The scale consisted of three set of statements. Each set of statement contained three sub- statement with weights 3, 2 and 1 indicating high, medium and low degree of innovativeness. The response of the respondents were obtained on five points continuum. On the basis of final scoring, the respondents were categorized into three categories based on mean and standard deviation as a measure of check.

S.No.	Categories	Characteristics
1.	Low Innovativeness	Less than 16
2.	Medium Innovativeness	16 to 21

3.	High Innovativeness	More than 21
Mean= 18.52		S.D.= 2.39

10. Scientific Orientation:

It is the degree to which the farmer is oriented to the use of scientific method in decision making and farming. It was operationalized as characteristic of farming apprehended by cultivator that social and natural force if understood mobilized through efforts and applied would have to solve human problem. In the present study scientific orientation was measured with the help of “scientific orientation scale” developed by Supe (1969). This scale consist of six statements of which, 6th statement was negatively keyed. Each statement was provided five response categories. The response to positive statement were scored as strongly agree-4, agree-3, undecided-2, disagree-1 and strongly disagree-0. The orders were reversed in case of negative statement. On the basis of range of scores, the respondents were categories into low, medium and high groups.

S.No.	Categories	Characteristics
1.	Low scientific orientation	Up to 14
2.	Medium scientific orientation	14 to 19
3.	High scientific orientation	Above 19
Mean= 16.65		S.D.= 2.70

11. Mass-media exposure:

The variable was operationalized as the exposure of an individual to different mass- media channels such as newspaper, farm magazine, radio, television and degree of participation in them. The respondent was asked to indicate whether he/she subscribed to or owned the channel said above. Then, the respondent was asked to indicate his/her degree of participation in terms of reading habit, listening behavior and viewing habit.

Subscription/Possession	Score
Subscriber/ Owned	1
Non-subscriber/ Not-Owned	0
Frequency of Reading/ Listening/ Viewing	
Regular	2
Occasional	1
Never	0

12. Extension Contact:

Extension contact has been operationalized as the frequency of contact of respondents with extension personnel and extension agencies for seeking information about farming practices. Accordingly, the respondents were categorized into three categories based on mean and standard deviation.

S.No.	Categories	Characteristics
1.	Low	Less than 3
2.	Medium	3-5
3.	High	More than 5
Mean= 3.93		S.D.= 0.25

3.2.2 Dependent Variable:

Impact of KMA services:

It refers to desirable changes in targeted population. Rosenzweig *et al* (2009) defined impact as the difference between what actually happened as a result of the implementation of a program, and what would have happened if the program had not been implemented. Impact evaluation is the process of identifying and measuring the impact (positive or negative) caused by such an intervention. Impact often takes time to become apparent, and can be caused by many factors other than one specific program. Based on the reviews of literature the following nine parameters viz. understanding of the message, time based information, need based information, applicability of message, save time and money, increase in social

contact, increase in knowledge, increase in productivity and adoption of message. To assess the impact of KMA services a device was developed and responses of the respondents were recorded on three point continuum scale for each nine aspects and assigned a scores like-

S.NO.	Aspect	Categories	Scores
1.	Understanding of the message	Highly understandable	2
		Partially understandable	1
		Not understandable	0
2.	Time based information	Timely	2
		Undecided	1
		Not timely	0
3.	Need based information	Needful	2
		Somewhat needful	1
		Not needful	0
4.	Applicability of message	Fully applicable	2
		Partially applicable	1
		Not applicable	0
5.	Save time & money	Agree	2
		Undecided	1
		Disagree	0
6.	Increase in social contact	Agree	2
		Undecided	1
		Disagree	0
7.	Increase in knowledge	Agree	2
		Undecided	1
		Disagree	0
8.	Increase in productivity	Agree	2
		Undecided	1
		Disagree	0
9.	Adoption of message	Fully adopted	2
		Partially adopted	1

		Not adopted	0
--	--	-------------	---

Finally an index was worked out considering the nine parameters to assess the impact of KMA services with the help of following equations:

$$I = \frac{Tsr}{Tos} \times 100$$

Where,

I = Impact of KMA on respondents

Tsr = Total scores obtained by respondents

Tos = Total obtainable score

3.3 Sources, instruments, and methods of data collection

3.3.1 Source of data collection

3.3.1.1: Primary data:

The respondents of the selected villages were the primary source of data collection. The primary data were collected personally by the researcher by interviewing the selected respondents with the help of structured and pre tested interview schedule.

3.3.1.2: Secondary data:

The secondary data were obtained from the Krishi Vigyan Kendra, Tikamgarh.

3.3.2: Instruments and method of data collection:

The interview schedule was designed for collecting the relevant information of selected variables. The question in interview schedule framed were simple, clear and directly related to the purpose of the study and were arranged in logical sequence. The data were collected personally with the help of pre-tested interview schedule from the respondents in Tikamgarh block, in order to be sure of the correctness

in response. The respondents were assured that the information given by them would be kept confidential and it would only be used for academic purpose. The relevance of each question in the context of the objectives of the study, their logical order and working of question etc. were carefully checked.

Practically, all the respondents had answered the questions fully, which was indicative of the fact that good rapport was established between the investigator and the respondents.

3.4: Processing and statistical analysis of data:

Data collected were qualitative as well as quantitative. The quantitative data were interpreted in terms of percentage and qualitative data were tabulation on the basis of approved categorization method as described earlier. The following statistical techniques were used in the study.

1. Frequency
2. Percentage
3. Mean
4. Standard deviation
5. Correlation coefficient
6. T-test
7. Mean scale value

1. Percentage:

The term “percentage” means a fraction whose denominator is 100 and the numerator of the fraction is called percentage.

$$P = \frac{X}{N} \times 100$$

Where;

P = Percentage

X = Frequency of respondents

N = Total number of respondents

2. Mean:

Mean was obtained by dividing the sum of the scores by the total number of cases involved, according to the formula:

$$X = \frac{\sum_{i=1}^n X_i}{N}$$

Where;

X = Mean

$\sum X_i$ = Sum of all the scores in the distribution

n = Number of respondents

N = Total number of respondents

3. Standard Deviation:

Standard Deviation is the measure of variability in a set of scores, computed for the purpose of analysis and further categorization of data. The standard deviation was calculated by using following formula:

$$S.D. = \sqrt{\frac{1}{N} \left[\sum x^2 - \frac{(\sum x)^2}{n} \right]}$$

Where,

$\sum x$ = deviation of the score from mean

N = number of observation

4. Karl Pearson's Coefficient of Correlation:

Coefficient of correlation is the degree to which variables have been observed to go together. It is a number computed from a set of data and summarizes the extent to which variations in one measure go

together with the variations in other measure. It was used to find out the relationship between the variables. The formula used is as follows:

$$r_{xy} = \frac{\text{Covariance } x,y (p)}{\sqrt{\text{Variance } x (p) \times \text{Variance } y (p)}}$$

Where,

r_{xy} = Correlation coefficient between character x and y

$\text{Cov}(x,y)$ = Co-variance of character x and y

$V(x)$ = Variance of character x, and

$V(y)$ = Variance of character y

5. Testing significance of correlation coefficient:

The t-test was used to test the significance of correlation coefficient. This test depicts whether the calculated correlation coefficient between the two variables is high enough to be considered as significant or not. If the r-values were found significant the correlation was considered as significant due to actual relation between the two variables otherwise it was attributed to chance or errors. The formula used for this is as follows:

$$t = \frac{r}{\sqrt{1-r^2}} \sqrt{N-2}$$

Where,

r = Correlation coefficient

N = Number of respondents in a group

The calculated value was compared with the table value of t at N-2 degree of freedom. If the calculated value of t was higher than the observed value then correlation between two variables was significant otherwise not.

6. Mean Scale Value

It is the total sum of the scores desired by multiplying the frequency with the assigned scores to the category and dividing by total number of respondents. It has been used to convert the frequency of each preference to a comparative level. The mean scale value was calculated using following formula;

$$\text{MeanScaleValue} = \frac{P_1 \times 4 + P_2 \times 3 + P_3 \times 2 + P_4 \times 1}{N}$$

Where,

P_1 = Frequency of respondent of 1st preference

P_2 = Frequency of respondent of 2nd preference

P_3 = Frequency of respondent of 3rd preference

P_4 = Frequency of respondent of 4th preference

N = Total number of respondents

3.5: Validity and Reliability of instrument:

Validity refers to whether the data collection instrument measure what it is supposed to measure. Validity of interview schedule for this study was maximized by taking the following steps:

1. The interview schedule was thoroughly discussed with the members of the authority, advisory committee and their suggestions were incorporated.
2. Pre-testing of the interview schedule provided an additional check for improving the instruments.
3. The relevance of each question in terms of the objectives was checked carefully.
4. Reliability of an interview schedule refers to its consistency. It has been observed properly, that the interview schedule had reliability before it was used as a data collection instrument.

3.6 Hypothesis of the study:

Relevant hypothesis were formulated on the basis of the study and was tested in the null form, as follows:

1. There is no relationship between age and impact of KMA services.
2. There is no relationship between gender and impact of KMA services.
3. There is no relationship between education and impact of KMA services.
4. There is no relationship between land holding and impact of KMA services.
5. There is no relationship between annual income and impact of KMA services.
6. There is no relationship between farming experience and impact of KMA services.
7. There is no relationship between material possession and overall impact of KMA services.
8. There is no relationship between social participation and impact of KMA services.
9. There is no relationship between innovativeness and impact of KMA services.
10. There is no relationship between scientific orientation and impact of KMA services.
11. There is no relationship between mass media exposure and impact of KMA services.
12. There is no relationship between extension contact and impact of KMA services.

Chapter – IV

Results

RESULTS

This chapter deals with the analysis and interpretation of collected data which were collected from the sample of 120 KMA Service user farmers through the pre-tested structured interview schedule. Calculation was made on the basis of frequency, percentage, mean, standard deviation, correlation, t-test and mean scale value. Findings of the study have been presented and inferences were drawn from them in relation to specific objectives of the study. Findings of the study are presented under the following subheads:

1. Socio-personal, economic, communication and psychological profile of respondents.
2. Impact of Kisan Mobile Advisory services on the respondents.
3. Opinion of KMA service users in making services more effective.
4. Relationship between profile characteristic and impact indicators.

1. Socio- personal, economic, communication and psychological profile of respondents

To study this aspect, factual information related to farmers were collected and analyzed. Socio-personal, economic, psychological and communication characteristics of farmers were studied in terms of age, gender, education, land holding, annual income, farming experience, material possession, social participation, innovativeness, scientific orientation, mass media exposure and extension contact.

1) Age

Table 4.1 reveals that out of total respondents, 65 per cent were of middle age group, followed by young (18.34%) and old (16.66%) age group.

Thus, it may be inferred from the data that maximum percentages of respondents (65.00%) were of middle age group.

Table 4.1: Distribution of respondents according to their age

S.No.	Categories	Frequency	Percentage
1.	Young (up to 26 years)	22	18.34
2.	Middle (26 to 50 years)	78	65
3.	Old (Above 50 years)	20	16.66
Total		120	100

2) Gender

Table 4.2 reveals that out of total respondents, 69.16 per cent were male and 30.84 per cent female respondents.

Table 4.2: Distribution of respondents according to gender

S.No.	Categories	Frequency	Percentage
1.	Male	83	69.16
2.	Female	37	30.84
Total		120	100

3) Education:

Table 4.3 shows that out of total respondents, 28.33 per cent respondents were illiterate, 17.5 per cent were educated up to middle school, 13.34 per cent of the respondents had high school education, 10.83 per cent were able to read & write only, and equal percentage of respondents i.e. 10 per cent were educated upto primary, higher secondary and were having graduation or more as the qualification.

Thus, it can be concluded that the maximum percentage (28.33%) of the respondents were illiterate.

Table 4.3: Distribution of respondents according to their education level

S.No.	Category	Frequency	Percentage
1.	Illiterate	34	28.33
2.	Only read and write	13	10.83
3.	Primary	12	10
4.	Middle	21	17.5
5.	High school	16	13.34
6.	Higher secondary	12	10
7.	Graduate/ More	12	10
Total		120	100

4) Size of land holding

Table 4.4 depicts that majority (45%) were having small size of land holding, followed by 28.33 and 26.67 per cent having medium and large size of land holding, respectively.

Hence, on the basis of the data it can be concluded that maximum percentage (45%) of the respondents were having small size of land holding.

Table 4.4: Distribution of respondents according to their land holding

S.N	Category	Frequency	Percentage
1.	Small farmers (2.51 to 5.0 acres)	54	45
2.	Medium farmers (5.01 to 10 acres)	34	28.33
3.	Large farmers (Above 10.01 acres)	32	26.67
Total		120	100

5) Annual income

Table 4.5 reveals that out of total respondents, 83.34 per cent were having medium level of annual income, followed by 6.66 per cent were in low income category and 10 per cent of the respondents belonged to high income group.

Thus, it can be inferred from the data that the maximum percentage (83.34%) of respondents were having medium annual income.

Table 4.5: Distribution of respondents according to their annual income

S.NO.	Categories	Frequency	Percentage
1.	Low income (Rs.<22485)	8	6.66
2.	Medium income (Rs.22485 – Rs.75948)	100	83.34
3.	High income (Rs.>75948)	12	10
Total		120	100

6) Farming experience:

A perusal of Table 4.6 indicates that out of total respondents, majority of the respondents (66.67%) were having 10-32 years of experience, followed by 1 to 10 years of experience (19.17%) and 14.16 per cent of respondents were having more than 32 years of experience .

Hence, on the basis of the data it can be concluded that maximum percentages i.e. 66.67 of respondents were having 10-32 years of farming experience.

Table 4.6: Distribution of respondents according to their farming experience

S.NO.	Categories	Frequency	Percentage
1.	Low (Upto 10 years)	23	19.17
2.	Medium (10 to 32 years)	80	66.67
3.	High (Above 32 years)	17	14.16
Total		120	100

7) Material Possession:

Data regarding material possession of respondents presented in Table 4.7 indicates that maximum percentage (62.5%) of respondents possess 'medium' material followed by those who had low (26.67%) and high (10.83%) material possession.

Hence, it can be concluded that majority of the respondents (62.5%) had medium level of material possession.

Table 4.7: Distribution of respondents according to their material possession

S.NO.	Categories	Frequency	Percentage
1.	Low (Less than 4)	32	26.67
2.	Medium (Between 4 & 8)	75	62.5
3.	High (More than 8)	13	10.83
Total		120	100

8) Social participation

Social participation means the voluntary sharing in person to person and in group to group relationship beyond the immediate household (Pathak, 2002). Table 4.8 indicates that out of the total 120 respondents, 32.5 per cent respondents had membership in social organization However, 67.5 per cent of the respondents were neither member nor office bearer in any social organization.

Table 4.8: Distribution of respondents according to their social participation

S.No.	Categories	Frequency	Percentage
1.	Member	39	32.5
2.	Office bearer	0	0
3.	Non member / non office bearer	81	67.5
Total		120	100

9) Innovativeness:

The data presented in table 4.9 indicate the distribution of respondents according to their innovativeness. It is clear that out of the total 120 respondents, 75.83 per cent had medium innovativeness, 17.5 per cent had low level and 6.67 per cent had high level of innovativeness.

Thus, it can be concluded that higher per cent (75.83%) of respondents had medium level of innovativeness.

Table 4.9: Distribution of respondents according to their innovativeness

S. No.	Categories	Frequency	Percentage
1.	Low Innovativeness (Less than 16)	21	17.5
2.	Medium Innovativeness (16 to 21)	91	75.83
3.	High Innovativeness (More than 21)	8	6.67
Total		120	100

Further, Fig. 2 shows the innovativeness of respondents. It is evident

from the figure that 60.83 per cent of the respondents were 'agree' to the statement that 'I try to keep myself up to date with information on new farm practices that does not mean that I try out all the new method on my farm', followed by 'undecided' (15.83%), 'disagree' (13.33%), 'strongly agree' (9.16) and a negligible percentage of respondents i.e. 0.83 per cent were 'strongly disagree' with the statement.

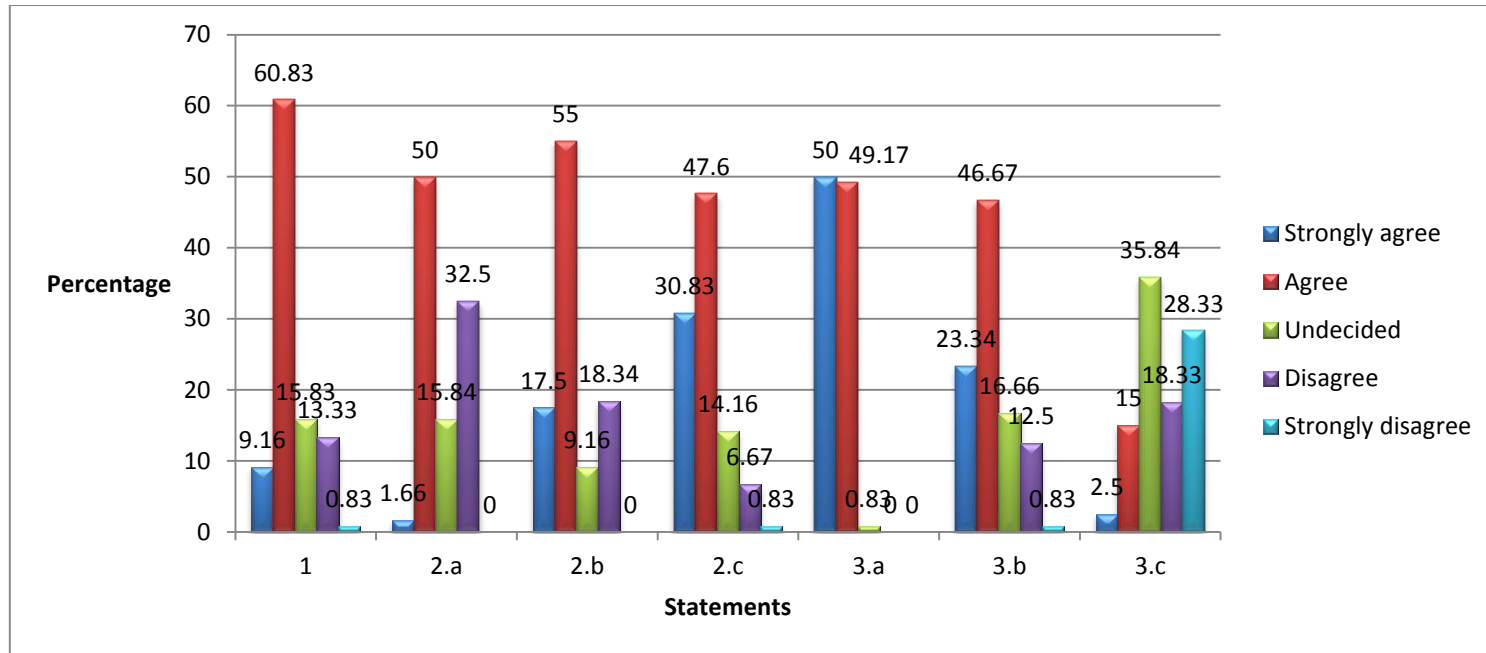


Fig.2 Innovativeness of respondents

Statements-

1. I try to keep myself up to date with information on new farm practices but that does not mean that I try out all the new method on my farm.
2. (a) From time to time I have heard of several new farm practices and I have tried out most of them in the last few years.
- (b) I usually wait to see that what result my neighbors obtain before I try out new farm practices.
- (c) Somehow I believe that traditional ways of farming are the best.
3. (a) I am cautious about trying a new practice.
- (b) After all our fore-fathers were wise in their farming practices and I do not see any reason for changing these old methods.
- (c) Often new farm practices are not successful, however if they promising, I would surely like to adopt them.

About the statement 'From time to time I have heard of several new farm practices and I have tried out most of them in the last few year', half of the respondents were 'agree' followed by 32.5, 15.84, and 1.66 per cent of the respondents who were 'disagree', 'undecided', and 'strongly agree' respectively, whereas none of the respondents were 'strongly disagree' with the statement.

Further, 55 per cent of the respondents were 'agree' to the statement 'I usually wait to see that what result my neighbors obtain before I try out the new farm practices', followed by 'disagree' (18.34%), 'strongly agree' (17.5%), 'undecided' (9.16%) and none of the respondents were 'strongly disagree' with the statement.

About forty seven per cent of the respondents were 'agree' to the statement that 'Somehow I believe that traditional ways of farming are the best' followed by 30.83, 14.16, 6.67 and 0.83 per cent of the respondents who were 'strongly agree', 'undecided', 'disagree' and 'strongly disagree', respectively, with the statement.

Regarding the statement that 'I am cautious about trying a new practice', the figure shows that 50 per cent of the respondents were 'strongly agree' to the statement followed by 'agree' (49.17%) and 'undecided' (0.83%), whereas none of the respondents disagree with the statement.

Near about forty five per cent of respondents were 'agree' to the statement that 'After all our forefathers were wise in their farming practice and I do not see any reason for changing these old methods' followed by 23.34, 16.66, 12.5 and 0.83 per cent of the respondents who were 'strongly agree', 'undecided', 'disagree' and 'strongly disagree' respectively, with the statement.

Further 35.84 per cent of the farmers were 'undecided' to the statement that 'Often new farm practices are not successful, however if they promising, I would surely like to adopt them' followed by 28.33, 18.33, 15.00, 2.5 per cent of the respondents who were 'strongly

disagree', 'disagree', 'agree' and 'strongly agree', respectively with the statement.

10) Scientific orientation:

It can be interpreted from Table 4.10 that maximum number of respondents (81.66%) had medium scientific orientation, 14.18 per cent had low and 4.16 per cent had high level of scientific orientation.

Thus, it can be concluded that higher percentage (81.66%) of respondent had medium level of scientific orientation.

Table 4.10: Distribution of respondents according to their scientific orientation

S. No.	Categories	Frequency	Percentage
1.	Low (Up to 14)	17	14.18
2.	Medium (14 to 19)	98	81.66
3.	High (Above 19)	5	4.16
Total		120	100

Fig. 3 revealed the scientific orientation of respondents. It is clear from the figure that 41.67 per cent of the respondents were 'undecided' to the statement that 'New scientific methods of farming give better result to farmer than the old methods', followed by 'agree' (38.34%), 'strongly agree' (9.16%), 'disagree' (8.33%) and 'strongly disagree' (2.5%).

Regarding the statement 'even a farmer with lots of experience should use new method of farming', 81.66 per cent of the respondents expressed their agreement as 'agree' followed by (14.17%) 'undecided'. Whereas 2.5 per cent and 1.67 per cent of the respondents were 'disagree' and 'strongly agree', respectively about the statement.

As far as the statement 'traditional methods of farming have to be changed in order to raise the living of farming' is concerned, 53.34 per cent of the respondents were 'agree' with the statement followed

by 'strongly agree' (20.00%), 'disagree' (18.33%), 'undecided' (7.5%), and 'strongly disagree' (0.83%).

A vast majority of the respondents i.e. 91.66 per cent were agree to the statement that 'a good farmer experiment with new idea in farming' followed by 5.84 and 2.5 per cent of the respondents who were 'undecided and 'disagree', respectively.

Further, 88.33 per cent of the respondents were 'agree' to the statement 'though it takes time for a farmer to learn new methods in agriculture it is worth the efforts' followed by 'undecided' (11.67%).

Regarding the statement 'the way of managing farming by our fore-father is still the best way to manage it today', 84.17 per cent of the respondents were 'agree' followed by 13.34 per cent of the respondents who were 'undecided'. Whereas an equal percentage of the respondents (0.83%) were strongly agree, disagree and strongly disagree with the statement which is very negligible of the total percentage of the respondents.

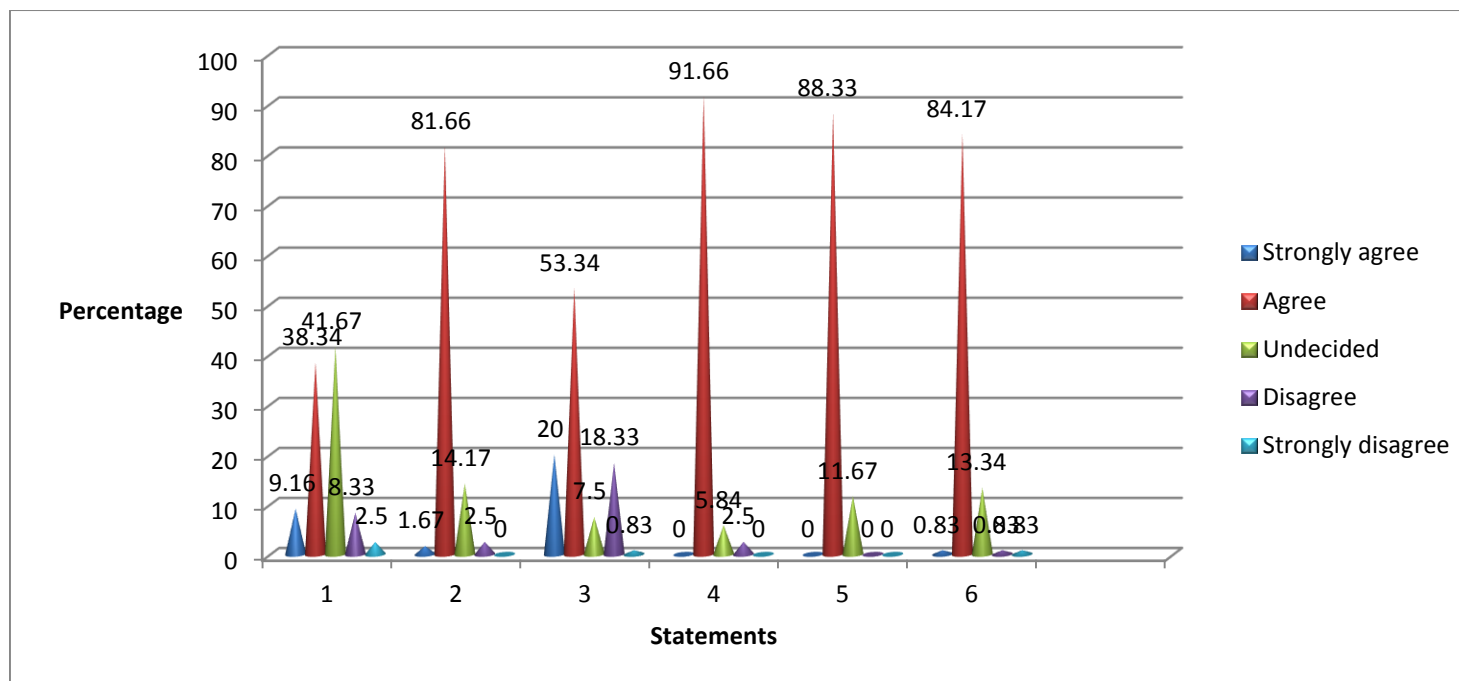


Fig.3 Scientific Orientation of respondents

Statements-

1. New scientific methods of farming give better results to farmer than the old methods.
2. Even a farmer with lots of experience should use new methods of farming.
3. Traditional methods of farming have to be changed in order to raise the living of farming.
4. A good farmer experiments with new idea in farming.
5. Though it takes time for a farmer to learn new methods in agriculture it is worth the efforts.
6. The way of managing farming by our fore-fathers is still the best way to manage it today.

11) Mass Media Exposure:

Table 4.11 presents the distribution of respondents according to their mass media exposure. It is evident from the data that out of the total 120 respondents, 50.00 per cent had medium level of mass media exposure, 29.16 per cent had low level and 20.84 per cent had high level of mass media exposure.

Thus, it can be concluded that majority of the respondents (50.00%) were having medium level of mass media exposure.

Table 4.11: Distribution of respondents according to their mass media exposure

S.No.	Categories	Frequency	Percentage
1.	Low (Up to 1)	35	29.16
2.	Medium (2 to 5)	60	50
3.	High (Above 5)	25	20.84
Total		120	100

12) Extension contact

It is clear from Table 4.12 that most of the respondents (57.5%) had low extension contact. In the medium and high categories, it was found to be 40.00 and 2.5 percentages, respectively.

Thus the result shows that majority of the respondents (57.5%) were having low extension contact.

4.12: Distribution of respondents according to their extension contact

S.No.	Categories	Frequency	Percentage
1.	Low (Less than 3)	69	57.5
2.	Medium (3 to 5)	48	40
3.	High (More than5)	03	2.5
Total		120	100

II. Impact of KMA services

Kisan mobile advisory service was started with the aim of passing the agriculture and related information to maximum number of farmers in shortest, cheapest way. Information regarding crop production, horticulture, dairy farming, weather forecasting, post harvest management / value addition are sent through SMS to the KMA users.

13) Distribution of KMA on the basis of area:-

The data presented in Table 4.13 revealed that during the assessment years 2013-14 and 2014-15 total numbers of 107 Kisan Mobile Advisory information disseminated among the KMA users were in the areas of horticulture (23), Livestock production and management (Animal husbandry) (22), Plant protection (19), Agronomy (18), Home science (16) and others (09). The other category includes information sent via SMS on Weather forecasting, Soil sciences, Post harvest management and Soil fertility.

Table 4.13: Distribution of KMA on the basis of area during the year 2013-14 & 2014-15

No.	Areas of KMA	No. of KMA delivered		Frequency
		2013-14	2014-15	
1.	Agronomy	6	12	18
2.	Horticulture	12	11	23
3.	Plant protection	7	12	19
4.	Livestock production & management	13	9	22
5.	Home science	7	9	16
6.	Others	2	7	9
	Total	47	60	107

Total number of 47 and 60 messages via KMA services were disseminated during 2013-14 and 2014-15, respectively.

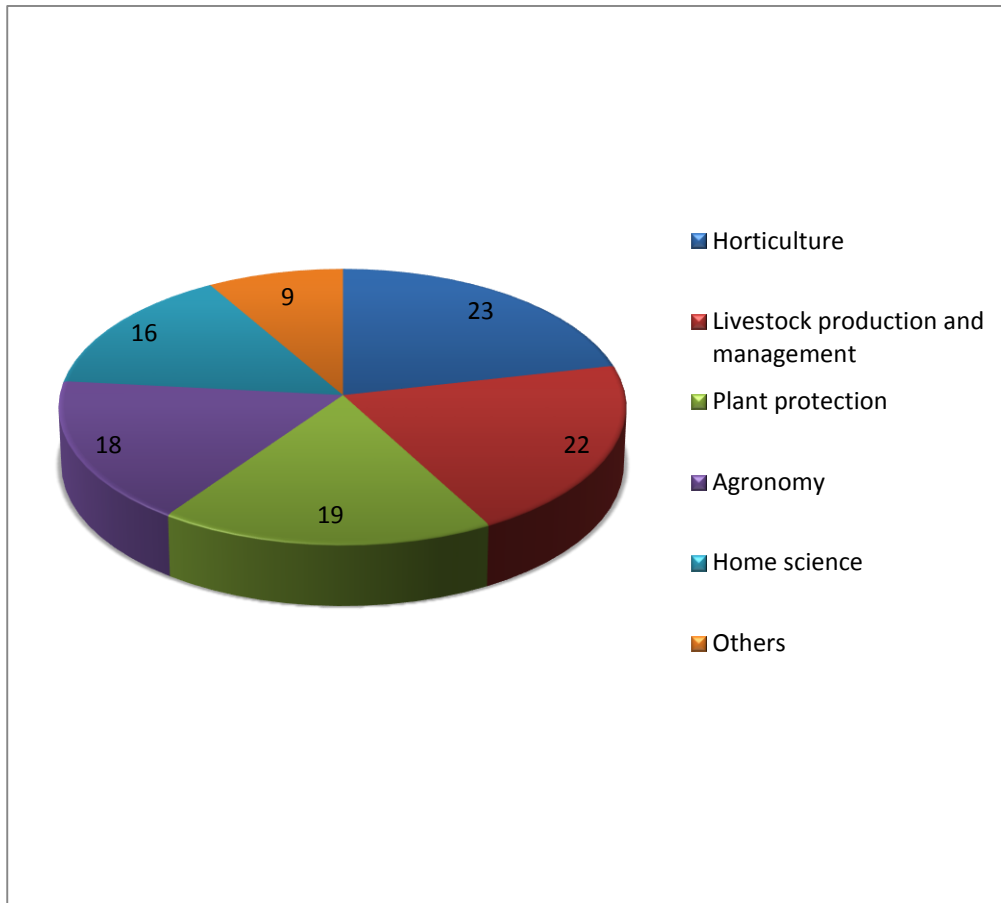


Fig. 4 Number of SMS sent pertaining to different discipline during 2013-15

14) Impact of KMA services

This section shows the impact of KMA services on the respondents of last two years i.e. from 2013 to 2015.

14.1 Understanding of the message

It is the ability of the respondents to comprehend the message delivered through Kisan Mobile Advisory services. The data presented in Table 4.14.1 indicates that messages were Partially to highly understandable for large majority i.e 46.67 per cent to 33.33 per cent of respondents, respectively followed by not understandable (20.00%).

Hence, it can be concluded that the message was partially understandable for a large majority of respondents.

Table 4.14.1: Distribution of respondents according to understanding of the message

Particular	Frequency	Percentage
Understanding of the message		
A. Highly understandable	40	33.33
B. Partially understandable	56	46.67
C. Not understandable	24	20
Total	120	100

14.2 Need based information

Need is the condition or situation in which something must be supplied in order for a certain condition to be maintained or a desired state to be achieved. In the present study it was the information supplied by KMA services according to the extent to which it is needed by the respondents. The data presented in Table 4.14.2 indicates that messages were needful for 90.84 per cent of the respondents, followed by somewhat needful (7.5%) very few respondents i.e. 1.66 per cent reported that message was not needful for them.

Thus, it can be concluded that the message was needful for the large majority i.e. 90.84 per cent of respondents.

4.14.2: Distribution of respondents according to need based information

Need based information	Frequency	Percentage
A. Needful	109	90.84
B. Somewhat Needful	9	7.5
C. Not Needful	2	1.66
Total	120	100

14.3 Time based information

Timely information is very important for farmers to be aware about various agricultural activities. Providing the right information at the right time will ensure the farmers to carry out their activities in a planned manner and achieve the best benefits from it. In present it was defined as providing required information through KMA to the respondents as and when needed. The data presented in Table 4.14.3 indicated that the large majority of respondents (51.66%) were agree that the messages were timely. Further, 43.34 per cent of respondents were undecided about the timeliness of information, whereas 5.00 per cent respondents reported that message were not timely.

Hence, it can be concluded that the message disseminated through KMA were timely for majority of the respondents.

Table 4.14.3: Distribution of respondents according to timeliness of information

Time based information	Frequency	Percentage
A. Timely	62	51.66
B. Undecided	52	43.34
C. Not timely	6	5
Total	120	100

14.4 Applicability of message

The applicability of a thing refers to how useful it is in a given situation. If something has applicability, it will come in handy at the moment it is needed. Here, it refers to the relevance or appropriateness of the messages delivered via KMA services by virtue of being applicable to the situation. As far as applicability of message is concerned, the data presented in Table 4.14.4 indicates that message was partially applicable for about 65.84 per cent of respondents. The message was fully applicable for 26.66 per cent of respondents and 7.5 per cent respondents reported that the message was not applicable for them.

Table 4.14.4: Distribution of respondents according to applicability of message

Applicability of message	Frequency	Percentage
A. Fully applicable	32	26.66
B. Partially applicable	79	65.84
C. Not applicable	9	7.5
Total	120	100

14.5 Save time and money

Time and money are important factors for farmers while performing agricultural operations. In the present study, it refers to the saving in term of time and money a result of messages delivered through KMA services to the respondents. The data presented in Table 4.14.5 revealed that out of total 120 respondents, 87.5 per cent of respondents agree that message received through KMA service 'save time and money', followed by 6.67 and 5.83 per cent of respondents 'undecided' and 'disagree'.

Thus, it can be concluded that majority of respondents agree with save time and money from the use of KMA Services.

Table 4.14.5: Distribution of respondents according to save time and money

Save time & money	Frequency	Percentage
A. Agree	105	87.5
B. Disagree	7	5.83
C. Undecided	8	6.67
Total	120	100

14.6 Increase in social contact

An individual's interaction with the group relationship beyond the immediate household is an important consideration. Social contact refers to sociological hierarchy leading upto social relations, an incidental social interaction between individuals. The data presented in Table 4.14.6 indicated that out of total 120 respondents, 80.84 per cent of respondent 'agree' with statement 'Increase in social contact', followed by 15.00 per cent and 4.16 per cent of respondent 'undecided' and 'disagree'.

Thus, it can be concluded that the majority of respondents 'agree' with 'increase in social contact'.

Table 4.14.6: Distribution of respondents according to increase in social contact

Increase in social contact	Frequency	Percentage
A. Agree	97	80.84
B. Disagree	5	4.16
C. Undecided	18	15
Total	120	100

14.7 Increase in knowledge

Knowledge may be defined as the result of perception and learning. Farmers knowledge can come from their own observations, learning or from information received from elsewhere. Farmers knowledge constantly being renewed as farmers adapt their practices to the changing conditions in view of new insight and learning.

In this context, KMA is the source of information through which knowledge of the respondents regarding various agricultural activities was increased. The data presented in table 4.14.7 indicated that out of total 120 respondents, a vast majority i.e. 85.83 per cent of respondents were agree that there is 'Increase in knowledge' as they become aware of agricultural operations at the right time because of SMS alert sent via KMA services. However, 7.5 and 6.67 per cent of respondents were 'Undecided' and 'Disagree', respectively regarding any increase in knowledge because of KMA services.

Hence it can be concluded that majority of the respondents were agree that as a result of KMA services there is increase in their knowledge level.

Table 4.14.7: Distribution of respondents according to increase in knowledge

Increase in knowledge	Frequency	Percentage
A. Agree	103	85.83
B. Disagree	8	6.67
C. Undecided	9	7.5
Total	120	100

14.8 Increase in productivity

Productivity is an average measure of efficiency of production. Here, it refers to an increase in productivity as a result of adoption of information sent through KMA services. The data presented in table

4.14.8 depicts that 67.5 per cent of respondents were agree that there is 'Increase in productivity' after adopting information sent through KMA services, followed by 18.34 and 14.16 per cent of respondents who were 'Disagree' and 'Undecided', respectively.

Thus, it can be concluded that the majority of respondents (67.5%) were agree that there is increase in productivity.

Table 4.14.8: Distribution of respondents according to increase in productivity

Increase in productivity	Frequency	Percentage
A. Agree	81	67.5
B. Disagree	22	18.34
C. Undecided	17	14.16
Total	120	100

14.9 Adoption of KMA services

The data presented in table 4.14.9 evince that out of total 120 respondents, 47.5 per cent of respondents fully adopted the information delivered through KMA services, followed by not adopted (26.66%) and partially adopted (25.84%).

It could be inferred from the findings were that the message were fully adopted by nearly half (47.5%) of the respondents.

Table 4.14.9: Distribution of respondents according to adoption of KMA services

S.No.	Categories	Frequency	Percentage
1.	Fully adopted	57	47.5
2.	Partially adopted	31	25.84
3.	Not adopted	32	26.66

14.10 Impact of KMA services

Table 4.14.10 indicated the impact of KMA services and it was found that KMA Services imposes medium impact on 72.5 per cent of respondents, followed by high (14.17%) and low (13.33%) impact on the respondents.

Hence, it can be concluded that the impact of KMA services on large majority of the respondents (72.5%) was found to be of medium level.

Table 4.14.10: Distribution of respondents according to impact of KMA Services

S.No.	Categories	Frequency	Percentage
1.	Low (<50 Scores)	16	13.33
2.	Medium (50-99 Scores)	87	72.5
3.	High (>99 Scores)	17	14.17
Total		120	100

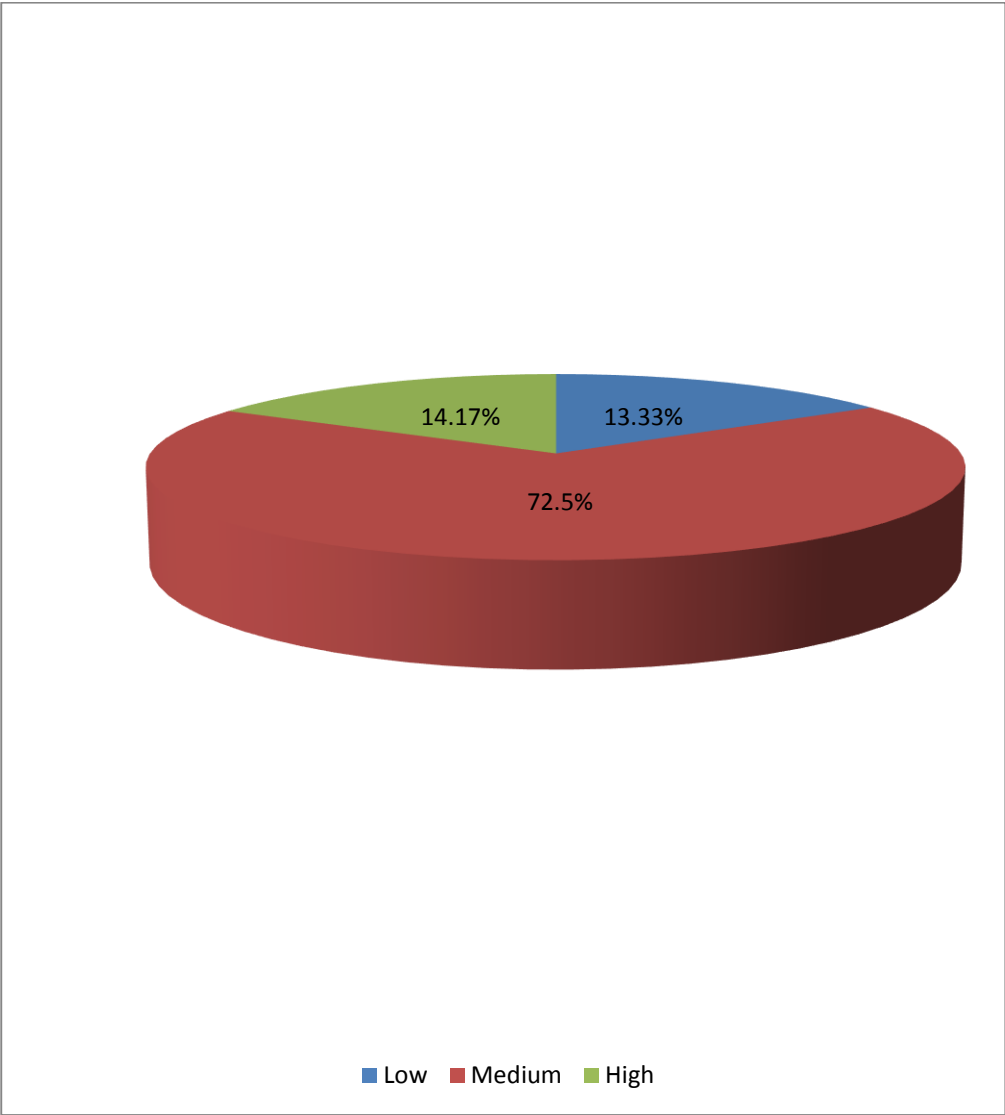


Fig.5 Impact of KMA services

15. Area wise distribution of problems discussed by KMA service users with SMS of KVK

Table 4.15 showed that the major areas of problem discussed by KMA service users for getting solution were crop production ranked first followed by horticulture, soil science, insect and pest problems, weather forecasting, post harvest management and livestock production & management ranked second, third, fourth, fifth, sixth and seventh, respectively. However, as far as the extent of discussion of KMA service users with SMS of KVK is concerned, maximum respondents rarely discuss the problems with the SMS of KVK to get the solutions.

Table 4.15 Area wise distribution of problems discussed by KMA service users with SMS of KVK

S . N .	Area of problem discussed	Extent of discussion Frequency (Percentage)				Mean scale value	Rank
		Once in a month	Fortnightly	Never	Occasionally		
1	Crop production	33 (27.5%)	2 (1.66%)	45 (37.5%)	41 (34.16%)	2.21	I
2	Insect and pest problems	25 (20.83%)	3 (2.5%)	4 (37.5%)	45 (38.33%)	1.69	IV
3	Horticulture	30 (25%)	2 (1.66%)	48 (40%)	39 (32.5%)	2.1	II
4	Livestock production & management	13 (10.83%)	2 (1.66%)	61 (50.83%)	35 (29.16%)	1.57	VII
5	Soil science	10 (8.33%)	3 (2.5%)	45 (37.5%)	59 (49.16%)	1.77	III
6	Weather forecasting	6 (5%)	3 (2.5%)	47 (39.16%)	57 (47.5%)	1.62	V
7	Post harvest management	8 (6.66%)	3 (2.5%)	48 (40%)	50 (41.66%)	1.6	VI
8	Others	–	–	–	–	–	–

III. Opinion of KMA service users in making the KMA services more effective

An opinion is a subjective statement or thought about an issue or topic, and is the result of emotion or interpretation of facts. The data in Table 4.16 presents the opinion of respondents in making the KMA services more effective. The table revealed that majority of the respondents (40.83%) opined that the message should be served in local language, followed by 37.5 per cent, 30.00 per cent and 28.33 per cent of the respondents who suggested to provide messages on latest technologies on agriculture and allied sector, voice message facility and market related upto date information, respectively. Further 16.66 per cent respondents opined that messages should be in simple language and should be understandable, followed by name of insecticides, pesticides etc. along with their approximate market prices (15.83%), message should be appropriate to farming situations (14.16%) and messages on agriculture related enterprises (3.33%).

Table 4.16 Opinion of KMA service users in making the KMA service more effective (N=120)

S.No.	Opinion	Frequency (%)	Rank
1.	The message should be simple and understandable	20 (16.66%)	V
2.	Message should be appropriate to the farming situation	17 (14.16%)	VII
3.	The message should be serve in local language	49 (40.83%)	I
4.	Voice message facility should be provided	36 (30%)	III
5.	Along with the name of the insecticides, pesticides etc, approximate market prices should also be communicated	19 (15.83%)	VI
6.	Message on agriculture related	4 (3.33%)	VIII

	enterprises should also be provided		
7.	Market related up to date information should be given	34 (28.33%)	IV
8.	Message on latest technologies on agriculture and allied sector should be provided	45 (37.5%)	II

IV. Relationship between profile characteristics and impact indicators

Table 4.17 (a) Relationship between profile characteristics and Impact of KMA services:

S.No.	Characteristics	Correlation coefficient 'r'
1	Age	-0.436 ^{NS}
2	Gender	0.551*
3	Education	0.642*
4	Land holding	0.149 ^{NS}
5	Annual income	0.228*
6	Farming experience	-0.441 ^{NS}
7	Material possession	0.394*
8	Social participation	0.248*
9	Innovativeness	0.476*
10	Scientific orientation	0.698*
11	Mass media exposure	0.667*
12	Extension contact	0.509*

* Significant at 5% level of significance

^{NS} Non-significant

4.4.1. Age

Null hypothesis

There is no relationship found between age and impact of KMA services.

Empirical hypothesis

There is significant association between age and impact of KMA services.

The correlation coefficient of age (-0.436) was found non-significant. This means that there is no relationship between age and impact of KMA services. Hence, the null hypothesis was accepted and original proposition that there is significant relationship between age and impact of KMA services was rejected.

4.4.2. Gender

Null hypothesis

There is no relationship between gender and impact of KMA services.

Empirical hypothesis

There is significant relationship between gender and impact of the KMA services.

The correlation coefficient of gender (0.551) was found significant at 0.05 level of probability. This means that there is a relationship between gender and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that there is significant relationship between gender and impact of KMA services was accepted.

4.4.3. Education

Null hypothesis

There is no relationship between education and impact of KMA services.

Empirical hypothesis

There is significant relationship between education and impact of the KMA services.

The correlation coefficient of education (0.642) was found significant at 0.05 level of probability. This means that there is a relationship between education and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that there is significant relationship between education of respondents and impact of KMA services was accepted.

4.4.4. Size of land holding

Null hypothesis

There is no relationship between size of land holding and impact of KMA services.

Empirical hypothesis

There is significant relationship between size of land holding and impact of KMA services.

The correlation coefficient of size of land holding (0.149) was found non-significant at 0.05 level of probability. This means that there is no relationship between size of land holding and impact of KMA services. Hence, the null hypothesis was accepted and original proposition that there is significant relationship between size of land holding and impact of KMA services was rejected.

4.4.5. Annual income

Null hypothesis

There is no relationship between annual income and impact of KMA services.

Empirical hypothesis

There is significant relationship between annual income and impact of the KMA services.

The correlation coefficient of annual income (0.228) was found significant at 0.05 level of probability. This means that there is a relationship between annual income and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that

there is significant relationship between annual income of respondents and impact of KMA services was accepted.

4.4.6. Farming experience

Null hypothesis

There is no relationship between farming experience and impact of KMA services.

Empirical hypothesis

There is significant relationship between farming experience and impact of KMA services.

The correlation coefficient of farming experience (-0.441) was found non-significant at 0.05 level of probability. This means that there is no relationship between farming experience and impact of KMA services. Hence, the null hypothesis was accepted and original proposition that there is significant relationship between farming experience and impact of KMA services was rejected.

4.4.7. Material possession

Null hypothesis

There is no relationship between material possession and impact of KMA services.

Empirical hypothesis

There is significant relationship between material possession and impact of the KMA services.

The correlation coefficient of material possession (0.394) was found significant at 0.05 level of probability. This means that there is a relationship between material possession and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that there is significant relationship between material possession and impact of KMA services was accepted.

4.4.8. Social participation

Null hypothesis

There is no relationship between social participation and impact of KMA services.

Empirical hypothesis

There is significant relationship between social participation and impact of KMA services.

The correlation coefficient of social participation (0.248) was found significant at 0.05 level of probability. This means that there is a relationship between social participation and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that there is significant relationship between social participation and impact of KMA services was accepted.

4.4.9. Innovativeness

Null hypothesis

There is no relationship between innovativeness and impact of KMA services.

Empirical hypothesis

There is significant relationship between innovativeness and impact of KMA services.

The correlation coefficient of innovativeness (0.476) was found significant at 0.05 level of probability. This means that there is a relationship between innovativeness and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that there is significant relationship between innovativeness and impact of KMA services was accepted.

4.4.10. Scientific orientation

Null hypothesis

There is no relationship between scientific orientation and impact of KMA services.

Empirical hypothesis

There is significant relationship between scientific orientation and impact of KMA services.

The correlation coefficient of scientific orientation (0.698) was found significant at 0.05 level of probability. This means that there is a relationship between scientific orientation and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that there is significant relationship between scientific orientation and impact of KMA services was accepted.

4.4.11. Mass media exposure

Null hypothesis

There is no relationship between mass media exposure and impact of KMA services.

Empirical hypothesis

There is significant relationship between mass media exposure and impact of KMA services.

The correlation coefficient of mass media exposure (0.667) was found significant at 0.05 level of probability. This means that there is a relationship between mass media exposure and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that there is significant relationship between mass media exposure and impact of KMA services was accepted.

4.4.12. Extension contact

Null hypothesis

There is no relationship between extension contact and impact of KMA services.

Empirical hypothesis

There is significant relationship between extension contact and impact of KMA services.

The correlation coefficient of extension contact (0.509) was found significant at 0.05 level of probability. This means that there is a relationship between extension contact and impact of KMA services. Hence, the null hypothesis was rejected and original proposition that there is significant relationship between extension contact and impact of KMA services was accepted.

4.17 (b) Relationship between profile characteristics and different parameters for assessing the impact of Kisan Mobile Advisory Services (N=120)

Further, looking into the relationship of profile characteristics with different parameters selected for assessing the impact of Kisan mobile advisory services, the result is presented in Table 4.17 (b). The data shows that gender, education, annual income, material possession, social participation, innovativeness, scientific orientation, mass media exposure and extension contact were found positively and significantly related with all the nine parameters indicating positive and significant relationship with the impact of Kisan mobile advisory services.

Whereas age, land holding and farming experience were non-significantly related with all the nine parameters and thus with the impact of KMA services.

Table 4.17 (b) Relationship between profile characteristics and different parameters for assessing the impact of Kisan Mobile Advisory Services (N=120)

S.No.	Characteristics	Parameters ("r value")								
		Understanding of Msg.	Need based information	Time based information	Applicability of Msg.	Save time & money	Increase in social contact	Increase in knowledge	Increase in productivity	Adoption of Msg.
1	Age	-0.416 ^{NS}	-0.252 ^{NS}	-0.432 ^{NS}	-0.349 ^{NS}	-0.353 ^{NS}	-0.271 ^{NS}	-0.294 ^{NS}	-0.257 ^{NS}	-0.251 ^{NS}
2	Gender	0.499*	0.356*	0.362*	0.358*	0.304*	0.404*	0.367*	0.456*	0.497*
3	Education	0.706*	0.380*	0.475*	0.528*	0.337*	0.406*	0.337*	0.495*	0.498*
4	Land holding	0.145 ^{NS}	0.117 ^{NS}	0.039 ^{NS}	0.217*	0.097 ^{NS}	0.093 ^{NS}	0.129 ^{NS}	0.094 ^{NS}	0.115 ^{NS}
5	Annual income	0.199*	0.189 ^{NS}	0.076 ^{NS}	0.293*	0.162 ^{NS}	0.167 ^{NS}	0.164 ^{NS}	0.136 ^{NS}	0.184 ^{NS}
6	Farming experience	-0.390 ^{NS}	-0.270 ^{NS}	-0.403 ^{NS}	-0.312 ^{NS}	-0.357 ^{NS}	-0.341 ^{NS}	-0.329 ^{NS}	-0.306 ^{NS}	-0.2332 ^{NS}
7	Material possession	0.397*	0.255*	0.294*	0.286*	0.268*	0.274*	0.243*	0.296*	0.290*
8	Social participation	0.229*	0.118 ^{NS}	0.178 ^{NS}	0.269*	0.168 ^{NS}	0.166 ^{NS}	0.154 ^{NS}	0.213*	0.139 ^{NS}
9	Innovative proneness	0.326*	0.322 ^{NS}	0.211*	0.355*	0.418*	0.415*	0.464*	0.346*	0.429*
10	Scientific orientation	0.557*	0.443*	0.443*	0.539*	0.514*	0.559*	0.506*	0.601*	0.508*
11	Mass media exposure	0.676*	0.367*	0.529*	0.533*	0.391*	0.400*	0.391*	0.517*	0.501*
12	Extension contact	0.387*	0.236*	0.499*	0.401*	0.273*	0.299*	0.268*	0.327*	0.535*

* Significant at 5% level of significance

^{NS} Non-significant

Chapter – V

Discussion

DISCUSSION

The chapter describes the findings of the present study on the basis of objectives along with logical reasoning and presented in the following heading:-

1. **Socio-personal, economic, communication and psychological profile of respondents.**
2. **Impact of Kisan Mobile Advisory services on the respondents.**
3. **Opinion of KMA service users in making services more effective.**
4. **Relationship between profile characteristics and impact indicators.**

1) **Socio-personal, economic, communication and psychological profile of respondents:**

Age:

The result shows that majority of the respondents (65%) were middle aged. It indicated that by and large, they were having quite satisfactory experience of life and their profession. This might have influenced their decision. The middle aged farmers were actively involved in the farm activities, are enthusiastic and had more work efficiency than older and younger ones. The above mentioned findings were in consonance with the findings of Sasidhar (2008), Chauhan (2010) and Kanavi & Jahagirdar (2014) who found that majority of respondents were middle aged.

Gender:

Gender wise participation of farmers in the KMA was an attempt to analyze which gender group had maximum involvement in availing the services of KMA. The result indicate the majority of the respondents (69.16%) availing the services of KMA were male. The

finding finds support from the work of Sasidhar (2008), Gurjar (2015) and Patra et al (2016).

Education:

As far as education is concerned, maximum percentages of respondents were illiterate (28.33%). It can be said that educational level of the respondents was not satisfactory. This might be because of lack of awareness about importance of education in their life. Because of low level of education many respondents suggest to provide KMA services in voice message form. The above mentioned findings were in consonance with the findings of Suchiradipta (2012) who found that majority of respondents were illiterate.

Size of land holding:

The finding regarding land holding indicates that maximum percentage of respondents (28.33%) were having small size of land holding. The fragmentation of ancestral land from generation to generation has lead to smaller size of land holding. Moreover agriculture may not be the only occupation for few.

Annual income:

With regards to annual income, majority of respondents (83.34%) belonged to medium income group (Rs.22485-Rs.75948). The possible reason may be that most of the respondents were having small size of land holding. This may also be attributed to farming background of respondents. The finding are in conformity with the findings of Agrawal et al (2014) and Kanavi & Jahagirdar (2014).

Farming experience:

As far as farming experience is concerned, the majority of the farmers (66.67%) were having medium farming experience i.e. 10 to 32 years experience. It can be inferred from the findings that the sampled farmers were having satisfactory experience in farming, which might have helped them in taking the decision about agriculture.

Material possession:

The finding regarding material possession revealed that maximum numbers of respondents (62.5%) were having medium material possession.

Social participation:

Regarding social participation, only 32.5 per cent of the respondents had membership in social organization whereas, 67.5 per cent of the respondents were neither member nor office bearer in any social organization. Further analysis of the data revealed that majority of the respondents had low level of social participation. This might have influencing their knowledge/understanding and their decision to adopt any new technology.

Innovativeness:

In case of innovativeness, higher percentage of respondents (75.83%) were noticed in medium innovativeness category. Innovativeness of individual depends upon many factors like education level, land holding, annual income, material possession etc. In present investigation, most of the respondents belonged to medium to low innovativeness category since, the factors like small land holding, medium annual income, medium scientific orientation, low extension contact, less participation in social organization might have exhibited this kind of result.

Scientific orientation:

Scientific orientation refers to the of extent use of scientific methods in each of his actions. It is the foresight, logical thinking and rationality which helps the individual to understand the object. The finding regarding scientific orientation revealed that maximum number of respondents (81.66%) had medium scientific orientation.

Mass media exposure:

As far as mass media exposure is concerned, half of the respondents (50.00%) were having medium mass media exposure. When the data was analyzed, the results revealed that majority of the

respondents possessed television and radio. This indicates that television and radio were the most effective common medium which was possessed by a large majority of the respondents. Increasing popularity and monopolization of television and affordability of radio dominated in its use over the other mass media. Moreover majority of the respondents in the study were illiterate, and those media i.e. television and radio overcome the barrier of illiteracy. The television viewing and radio listening were done for purposes other than the agricultural programmes. The less utility, lack of practicality and inconvenient timing of agricultural programmes were the reasons that could be attributed to this finding.

Extension contact

The results shows that majority of the respondents (57.5%) were having low extension contact as the respondents reported that they made contact with extension personnel only and when needed.

2) Impact of KMA services:

To assess impact of Kisan mobile advisory services on the respondents a device was developed considering the nine parameters i.e. understanding of the message, time based information, need based information, applicability of message, save time and money, increase in social contact, increase in knowledge, increase in productivity and adoption of message and the responses were recorded on three point continuum. The result obtained indicated that messages were partially to highly understandable for large majority i.e 46.67 to 33.33% of respondents.

Further, the data shows that messages were needful for 90.84 per cent of the respondents. KMA provided a wide bouquet of agricultural information's ranging from their land preparation to harvesting and storage and timeliness also about allied enterprises but needfulness of the messages was very important. The finding were nearby to the findings reported by Saxena et al (2011).

The finding regarding time based information revealed that majority of respondents (51.66%) were agree that the messages were timely. The results are in consonance with the results of Sandhu et al (2012).

As far as applicability of message is concerned, the result indicated that message was partially to fully applicable for about 65.84 per cent to 26.66 per cent of respondents.

It is evident from the data that 87.5 per cent farmers expressed their views regarding KMS that it saved the time and money. The finding were nearby to the findings reported by Saxena et al (2011).

The farming community resides at villages of our country. In villages farmers have a very close relationship with each other and hence are in regular touch and interact among themselves. In case of receiver i.e. the message reader, was regarded as a very important person among the villagers as he acts also as a communicator or interpreter of the KMA. The result indicated that the total 80.84 per cent of the respondents agree that this increased their credibility and technical reliability among the farming community and apparently respondents had clearly stated that the KMA has increased their social contact and importance as a resource with creditability and reliability. The findings supported by Kansana et al (2015).

As far as the findings related to increase in knowledge is concerned that 85.83 per cent respondents were agree that their knowledge regarding various agricultural operations was increased after availing KMA services.

Regarding 'increase in productivity' as a result of KMA services the findings revealed that 67.5 per cent of respondents were agree that there is increase in productivity after adopting information received through KMA.

Further, results revealed that majority of farmers (47.5%) fully adopted the information delivered through KMA services.

Regarding the impact of KMA services on the respondents the results indicates that KMA imposes medium impact on 72.5 per cent of respondents.

3) Opinion of KMA service users in making services more effective:

As far as opinion of KMA service users in making services more effective is concerned, the result revealed that majority of the respondents opined that messages should be served in local language followed by providing messages on latest technologies on agriculture and allied sector, providing voice messages, market related upto date information, simple language should be used, along with names of insecticides, pesticides etc. approximate market prices of the same should be provided, message appropriate to their farming situations and message on agricultural related enterprises should be provided.

4) Relationship between profile characteristics and impact indicators:

Out of the twelve variables, nine variables viz. gender, education, annual income, material possession, social participation, innovativeness, scientific orientation, mass-media exposure and extension contact were significantly related with impact of KMA services, whereas age, land holding and farming experience had no relationship with the impact of KMA services.

Chapter – VI

Summary, conclusion and suggestion for further work

SUMMARY, CONCLUSION AND SUGGESTIONS FOR FURTHER WORK

Agriculture provides rural livelihood to more than half of the population (55%) in India. Rural farmers are producers and consumers also in the food security equation. Their action, production, harvesting and marketing are critical determinants of global food security. Information plays a critical role at every stage of this action chain. The information and communication technologies like radio, T.V., newspapers, telephones and magazines are playing a major role in sustainable agricultural development since the early decade and now the modern information communication technologies (ICTs) as mobiles and computers have created a revolution. In the 21st century, cost effective and efficient communication technologies are required to take lead in the changing agricultural scenario.

Kisan mobile advisory services (KMA) is one such initiative of ICT which provide location specific and crop specific farm advisory services and facilities to the farming community in a given area. The KMA services through messages have been provided to the respondent with consultation of expert of different fields to improve farmer's agricultural technical knowledge with decision making ability, so that they may enable to increase their production and productivity to fulfill market demands with securing better quality life and income in present competitive agrarian economy. However, in agriculture despite the rapid spread and potential of ICTs to facilitate farmer's access to information, affordability, ease of use, accessibility, scalability and availability of relevant and logical content in an appropriate language (Keinston 2002, Dossani, Misra, and Jhaveri 2005, Saravanan, 2010).

Keeping these facts in mind, the present study entitled "Impact of Kisan mobile advisory services in Tikamgarh district of Madhya Pradesh" was conducted with the following objectives :

1. To study the socio-personal, economic, communication and psychological profile of respondents.
2. To assess the impact of Kisan mobile advisory services on the respondents.
3. To seek opinion of KMA service users in making services more effective.
4. To find out the relationship between profile characteristics and impact indicators.

The study was conducted in Tikamgarh district of Madhya Pradesh. The district was purposively selected for the study as one of the Krishi Vigyan Kendra under the jurisdiction of JNKVV, Jabalpur is functioning here and is responsible for providing KMA services to the farmers. Further in Tikamgarh district, Tikamgarh block was selected purposively as maximum number of registered farmers availed the KMA services provided by the KVK. From the selected block six villages viz. Kanti, Heeranagar, Madumar, Bawri, Anantpura and Lar were selected. From the six villages, 120 respondents were selected randomly. Thus, the total sample size consist of 120 respondents.

The study was focused to know the Impact of KMA services in relation to socio-personal, economic, communication and psychological variables of the respondents i.e. age, gender, education, land holding , annual income, farming experience, material possession, social participation, innovativeness, scientific orientation, mass media exposure and extension contact were selected as independent variables, while impact of KMA services was the dependent variable.

The primary data were collected personally by interviewing the selected respondents with the help of structured and pre-tested interview schedule. The secondary data were collected from Krishi Vigyan Kendra, Tikamgarh. The data were analyzed using mean, standard deviation, frequency, percentage, correlation, t-test, and mean scale value.

6 Conclusions:

After collection of data and its statistical processing the major findings of the present study can be summarized as follows:

6.1 Profile of respondents:

1. A vast majority of the respondents were in medium age group.
2. About 70.00 per cent of the respondents were male.
3. Most of the respondents were illiterate.
4. Majority of the respondents were having small size of land holding.
5. An overwhelming majority of the respondents were having medium annual income.
6. Most of the respondents were having medium farming experience.
7. Maximum number of respondents were having medium level of material possession.
8. As far as social participation is concerned, majority of the respondents were neither member nor office bearer in any social organization.
9. Maximum number of respondents were having medium level of innovativeness.
10. Major proportion of the respondent were having medium level of scientific orientation.
11. Half of the respondents were having medium level of mass media exposure.
12. More than half of the respondents had low extension contact.

Thus, it can be concluded that majority of the Kisan Mobile Advisory service users belonged to middle age group, male, illiterate, small size of land holding, medium annual income, had medium farming experience, medium material possession, neither member nor

office bearer in any social organization. In case of communication attributes higher percentages of respondents were having low extension contact and medium level of mass-media exposure. In case of psychological attributes, innovativeness and scientific orientation were found to be of medium level among most of the respondents.

6.2 Impact of Kisan Mobile Advisory services:

The study indicate that KMA is one of the most useful tool for dissemination of agriculture information to farmer and also can play a greater role in enhancing efficiency of extension service by reaching large number of peoples. Result of study shows that messages was partially understandable, needful, timely, partially applicable, save time and money, increase social contact, increase knowledge, increase productivity and the information provided via KMA services was fully adoptable.

On the basis of results can be concluded that the overall impact of KMA Services on the respondents is of medium level.

6.3 Opinion of KMA service users in making services more effective:

As far as opinion of KMA service users in making services more effective is concerned, the results revealed that majority of the respondents opined that messages should be served in local language followed by providing messages on latest technologies on agriculture and allied sector, providing voice messages, market related upto date information, simple language should be used, along with names of insecticides, pesticides etc. approximate market prices of the same should be provided, message appropriate to their farming situations and messages on agricultural related enterprises should be provided.

6.4 Relationship between profile characteristics and impact indicators:

It is clear from the results that out of the twelve variables, nine variables viz. gender, education, annual income, material possession, social participation, innovativeness, scientific orientation, mass-media exposure and extension contact were significantly related with impact of KMA services, whereas age, land holding and farming experience had no relationship with the impact of KMA services on the respondents.

6.5 Suggestions for further work:

- 1) The study was confined to Tikamgarh block of Tikamgarh district of Madhya Pradesh, on sample of 120 respondents therefore, generalization based on this alone may not be meaningful. Therefore, it is very important that the study has to be extended to other part of the district as well as other districts in order to generalize the findings to a greater utility.
- 2) In the present study, limited parameters were considered. Therefore, it is required to study other parameters to assess the impact of KMA services.
- 3) More intensive statistical techniques should be used for improving contribution of different variables which might be given more strength to the study.

Chapter – V

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Appendix

Interview schedule

Jawaharlal Nehru Krishi Vishwa Vidhyalaya, Jabalpur (M.P.)

College of Agriculture, Tikamgarh (M.P.)

Major Advisor	Researcher
Dr. Kamini Bisht	Shraddha Bhatnagar
Head of Section	M.Sc.(Ag)final year
Dr. S.P. Singh	
Deptt. of Extension Education	

Title: Impact of Kisan Mobile Advisory Services in Tikamgarh district of Madhya Pradesh.

Name of the respondent.....

Village..... Block..... District.....

1.Age

2. Education: 1. Illiterate: (), 2. Only read and write: (), 3. Primary (), 4. Middle: (), 5. High school: (), 6. Higher secondary (), 7. Graduation or more ()

3. Gender: Male/Female

4. Annual income.....(in rupees)

5. Land holding:

S.N.	Land holding	Dry (hac.)	Irrigated (hac.)	Total
1.	Owned			
2.	Leased in			
3.	Leased out			
	Total			

6. Social participation: Indicate your participation in various social organizations as member or office bearer.

S.N.	Institution	Member	Office bearer	Extent of participation		
				Regular	Occasional	Never
1.	Gram Panchayat					
2.	Youth club					
3.	SHG					
4.	Cooperatives					
5.	Other(Specify)					
	1.....					
	2.....					

7. Farming experience.....(in years)

8. Material possession:-

1. Table..., Chair....., Fan....., Sofa.....TV....., Radio....., Refrigerator..., Cooler....., Jeep/Car....., Motor cycle....., Tractor....., Mobile phone....., Computer.....

2. Other.....

9.. Scientific orientation: Please indicate your response to the following statement.

S.N.	Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1.	New scientific methods of farming give better results to farmer than the old methods.					
2.	Even a farmer with lots of experience should use new methods of farming.					
3.	Traditional methods of farming have to be changed in order to raise the living of farming.					
4.	A good farmer experiments with new idea in farming.					
5.	Though it takes time for a farmer to learn new methods in agriculture it is worth the efforts.					
6.	The way of managing farming by our for- fathers is still the best way to manage it today.					

10. Mass media exposure: Please indicate which of the following source you have used for information on agriculture and allied sectors and how often.

S. N.	Mass media sources	Subscriber/ Owner	Programme				Frequency of use	
			Ag. programme	News	Entertainment	Regular	Occasional	Never
1	Radio							
2	TV							
3	Newspaper							
4	Magazines							
5	Internet							
6	Others specify							

11. Innovativeness: Please indicate your response to the following statements.

S. N.	Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1.	I try to keep myself up to date with information on new farm practices but that does not mean that I try out all the new method on my farm.					
2.	(a) From time to time I have heard of several new farm practices and I have tried out most of them in the last few years.					
	(b) I usually wait to see that what result my neighbors obtain before I try out new farm practices.					
	(c) Somehow I believe that traditional ways of farming are the best.					
3.	(a) I am cautious about trying a new practice.					
	(b) After all our fore-fathers were wise in their farming practices and I do not see any reason for changing these old methods.					
	(c) Often new farm practices are not successful, however if they promising, I would surely like to adopt them.					

12. Extension contact: How often do you contact the extension personnel?

S.NO.	Extension personnel	Frequency of contact			
		Once in a week	Once fortnight	When needed	Never
1.	ADO				
2.	RAEO				
3.	University scientist				
4.	Private company field staff				
5.	Other (specify)				

13. Impact of KMA services:

1. When you have registered for KMA services?
2. How do you registered yourself?
3. From where you received information regarding KMA services?
4. Can you read the KMA messages by yourself? If not, who assist you in reading the messages?

I. Area wise distribution of KMA:

No.	Areas of KMA	No. of KMA delivered		Total
		2013-14	2014-15	
1.	Agronomy			
2.	Horticulture			
3.	Plant protection			
4.	Livestock production & management			
5.	Home science			
6.	Others			

II. Please indicate your response to the following points

Particular	Response
1.Understanding of the message	
A. Highly understandable	
B. Partially understandable	
C. Not understandable	
2.Need based information	
A. Needful	
B. Somewhat Needful	
C. Not Needful	
3.Time based information	
A. Timely	
B. Undecided	
C. Not timely	
4.Applicability of message	
A. Fully applicable	
B. Partially applicable	
C. Not applicable	
5.Save time & money	
A. Agree	
B. Disagree	
C. Undecided	

6. Increase in social contact	
A. Agree	
B. Disagree	
C. Undecided	
7. Increase in knowledge	
A. Agree	
B. Disagree	
C. Undecided	
8. Increase in productivity	
A. Agree	
B. Disagree	
C. Undecided	
9. Adoption of KMA Services	
A. Fully adopted	
B. Partially adopted	
C. Not adopted	

III. Area wise distribution of problems discussed by KMA service users with SMS of KVK

S.NO.	Area of problem discussed	Frequency of discussion/(%)			
		Once in a month	Fortnightly	Never	Occasionally
1.	Crop production				
2.	Insect and pest problems				
3.	Horticulture				
4.	Livestock production & management				
5.	Soil science				
6.	Weather forecasting				
7.	Post harvest management				
8.	Others				

IV. Constraints faced by respondents while availing KMA information during 2013-15.

V. Suggestion for improvement of KMA services.

ABBREVIATIONS

ICT = Information and Communication Technology

ICTs = Information and Communication Technologies

KMAS = Kisan Mobile Advisory Services

KMS = Kisan Mobile Sandesh

KVK = Krishi Vigyan Kendra

SMS = Short Message Services

SMS = Subject Matter Specialist

Vitae

Curriculum Vitae

The author of this thesis **Ms. Shraddha Bhatnagar D/o Shri Prakash Bhatnagar** was born on June 2, 1992 at Tikamarh (M.P.). She passed her Higher Secondary Examination from M.P. Board of Secondary Education, Bhopal.

In 2010 she joined JNKVV, College of Agriculture, Tikamgarh and successfully completed her B.Sc. (Ag.) degree in the year 2014 with 7.83 OGPA out of 10.00 scale. After graduation she joined M.Sc. (Ag.) in Extension Education at college of Agriculture, JNKVV, Tikamgarh where she successfully completed the entire course requirement for master's degree

For the partial fulfillment of the master's degree programme she was allotted a research problem on "**Madhya Pradesh**" which was successfully conducted by her and presented in the form of this thesis