

Decision-Oriented Information Systems for Farmers: A Study of Kisan Call Centres (KCC), Kisan Knowledge Management System (KKMS), Farmers Portal, and M-Kisan Portal in Gujarat

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Centre for Management in Agriculture (CMA)
Indian Institute of Management Ahmedabad (IIMA)

Supported by Ministry of Agriculture and Farmers Welfare
Government of India

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Final Report



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Preface

The Centre for Management in Agriculture (CMA), Indian Institute of Management, Ahmedabad (IIMA) is actively engaged in applied research and education on important current topics and challenges in the management of the food, agriculture, agribusiness and rural sectors of the Indian economy and the world. The Centre is supported by the Ministry of Agriculture & Farmers Welfare, Government of India, and advises the government on its important policies and schemes through its research. The topics of research covered include delivery of agricultural inputs & technologies, agro-processing, agri-food marketing, rural infrastructure, rural institutions, new technologies and services for agriculture, international trade, WTO, commodity markets, food supermarkets and value chains, food safety, organic food, and farmer producer companies.

The Kisan Call Centres (KCC) (Farmer Call Centres) were launched in 2004 as an innovative and modern national scheme by the Government of India for expeditiously delivering extension information and support to the farmers, using the vast telecommunication network which has developed rapidly. It helps overcome the handicaps of the traditional personal extension system which was often proved inadequate in meeting the urgent demands and queries for the latest information by the farmers. This study has examined the design, implementation and performance of the KCCs in the context of providing a decision oriented information system for farmers, and also observing the related portals of Kisan Knowledge Management System (KKMS), Farmers Portal, and M-Kisan Portal. The study was implemented by the Centre for Management in Agriculture (CMA), IIM Ahmedabad, along with a coordinated study at the All-India level.

The authors wish to thank the Ministry of Agriculture and Farmers Welfare, the Head and Staff of the Kisan Call Centre in Ahmedabad, Gujarat, and all the survey staff and respondents. We hope the study will be found useful by policymakers, administrators, service providers, researchers, and those seeking to bring innovation and change for enhancing the performance of the agriculture sector, the rural economy and the welfare of farmers.

March 2018

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List of Abbreviations

AERC	Agro Economic Research Centres
AO	Avaaj Otalo
CMA	Centre for Management in Agriculture
CSC	Common Service Centres
DAC&FW	Department of Agriculture Cooperation & Farmers Welfare
DLDO	District Level Designated Officers
FTA	Farm Tele Advisor
ICT	Information & Communication Technology
IT	Information Technology
IVRS	Interactive Voice Response System
KCC	Kisan Call Centre
KCC	Kisan Credit Card
KKMS	Kisan Knowledge Management System
KVK	Krishi Vigyan Kendra
NeGP-A	National e-Governance Plan- Agriculture
SAU	State Agriculture Universities
SLDO	State Level Designated Officers
USSD	Unstructured Supplementary Service Data



Executive Summary

Introduction

- The Kisan Call Centre (KCC) (Farmer Call Centre) scheme has been launched as an innovative and modern scheme of the government for expeditiously delivering extension information and support to the farmers, using the vast telecommunication network which has grown remarkably. It helps overcome the handicaps of the traditional personal extension system which is often inadequate in meeting the pressing queries and demands for the latest information by the farmers. The KCC scheme was launched by the Ministry of Agriculture & Farmers Welfare, Government of India in 2004. The study has examined the design, implementation and performance of the KCC scheme in Gujarat, and also observe the related systems of Kisan Knowledge Management System (KKMS), Farmers Portal, and M-Kisan Portal.
- To make correct decisions on various critical matters, farmers frequently need information and advice on many different technical and economic aspects. The information helps them to make correct decisions on matters such as the right crop & variety to plant, the correct inputs to apply to solve problems, and the right practices to follow so as to manage their farms successfully and achieve the best productivity and returns. Inadequate and imperfect information leads to poor decisions, poor farm performance, and in the worst cases even to crop failures and suicides. Systems to provide good & up to date information and knowledge to the farmers are therefore extremely crucial for their productivity & livelihoods as well as the performance of the agriculture sector.
- The modern management approach to designing a good information system focuses on the main decision-making needs of the firm or managers. The approach first identifies the key decision-making needs for best achieving the objectives of the firm. Then, in order to make these key decisions well, it identifies what key information that will be required. This includes not only “what”, but also “when”, “where” and “who” of the information. Then, squarely based on this examination, a tailor-made information system is designed and implemented, which would most effectively and directly provide the information when and where it is needed. The result is an information system which directly leads to better decision-making and performance.

Method & Coverage

- The study was designed & implemented by the Centre for Management in Agriculture (CMA), IIM Ahmedabad. Based on relevant and multiple criteria including geographic and Agro-climatic diversity, KCC system use levels, the following 4 districts were covered in the study sample. For a comprehensive study, three different levels were investigated: the Gujarat Kisan Call Centres (KCC) - 1, the Farm Tele Advisors (FTAs) - 27 FTAs, and Farmers – 120 farmers, including 98 users and 22 non-users.

KCC National & Gujarat Call Data

- The Kisan Knowledge Management System (KKMS) database at the national level records the broad information on the calls received by all the KCCs in the country. Examination of this data indicates that over 61 lakh live calls were recorded in the country during 2016-17. In terms of total live calls Gujarat is at 2.3 lakh. Gujarat stands 11th rank in terms of total live calls during 2016-16. Among the crop subjects for calling, Groundnut and Cotton. Among the reasons for calling, the highest number of calls were for weather information, followed by plant protection, cultural practices government schemes, field preparation and market information. This indicates a diversity of topics, with weather, plant protection and government schemes as important ones.

KCC Centre & Supervisor Survey

- Centre Supervisors head the KCC and their responses indicate that Gujarat covers Daman & Diu. The KCCs can communicate in the local languages. Over the years after being launched in 2004, the KCCs have undergone significant improvement and change, particularly since 2012 when outsourcing was done to IFFCO. Comparing the past KCC to the present, all the KCC Supervisors agree or strongly agree that the changes have brought about better hardware, better software, better connectivity, better database and better ability to respond to farmers' calls. The KCC are now equipped with integrated hardware of personal computers, headphones, and printers/ scanners. Gujarat have all-in-one desktops of Windows i5 or i3 type. The call handling softwares are identified as Agent Openscape Contact Centre, Openscape Desktop and Real Time Viewer. The performance of the hardware and software is reported to be good by the KCC Supervisor but the internet connectivity is not satisfactory, and there is dissatisfaction regarding infrastructure, service support, and the systems and policies. The KCC Supervisor, report that daily a large number of calls are received and handled efficiently at

the KCC, and the communication between the FTAs and farmers is good. Some problems are reported regarding the availability of the necessary information on time, and with the farmers understanding and satisfaction with the information. But the usefulness of KCC is reported to be good to excellent and all KCC supervisors indicate that the KCC should continue.

Farm Tele Advisors (FTA) Survey

- The Farm Tele Advisors (FTAs) are the ones who actually receive and respond to the calls of the farmers and therefore, their responses are from direct experience and are important. A total 27 Farm Tele Advisors (FTAs) were surveyed. All the FTAs were graduates, with 66 percent from B.Sc. Agriculture background, indicating that they are appropriately qualified. Regarding the hardware, about 81 percent of the FTAs find the hardware adequate and working well, but many report problems of breakdown and the headsets not comfortable. Regarding the software, about 80 to 90 percent indicate that the software is up to date, fast and user-friendly, but over 44 percent report problems of call drop, lost or mishandled calls. Besides, 85 percent FTA's reported the inability to block of irrelevant calls. Regarding the knowledge sources used by FTAs to answer farmer's questions, the most frequently used is self-knowledge used by over 96 percent, followed by prepared excel sheets and materials by over 74 percent, jointly by internet search at 62 percent. A majority of FTAs indicate the inadequacy of extension booklets and government department sources and materials, and a very large number report the inadequacy in the response of university experts, and nodal officers.
- Regarding the websites, the KKMS website is used almost all the time by the FTAs, and is reported to be easy to use, clear and well organized. However, its response is often slow and the information often not up to date. With respect to the farmers' portal website, FTAs of Gujarat Kisan Call Centre do not use. Also, awareness among the FTA's was very less. The M-Kisan website is found to work well, but it is not convenient and very useful and it is not frequently used. The FTAs find the KCC office space largely adequate, but many don't find the work environment very satisfactory and see scope for improvement. Regarding the training programs, their main contributions reported by FTAs are in understanding farmers questions, how to handle them, and in obtaining some of the necessary information, but they are inadequate in covering hardware and software operation, and the knowledge of government schemes. The FTAs indicate a substantial need for more, better and regular training.

- FTAs indicate that it is not difficult to understand the farmers, and farmers don't have difficulty in understanding them, but farmers have difficulty in understanding scientific and technical terms. FTAs face considerable problem of irrelevant calls and abusive language. Regarding the call answering system, the FTAs report that they generally handle and answer most questions themselves, and else with help of colleagues and supervisors. Escalation to Level 2 is not working well and these calls are not speedily or well attended to by the state agriculture experts. The escalation to Level 3, fares even worse as nodal officers do not often attend even through SMS or other means. Regarding the information available, about few FTAs report that adequate information is available at KCC, but the rest see scope for improvement. For technical questions, over 60 percent think that the answers given are adequate, and so also for weather and general information. However, on government schemes and market-related queries, the information provided is considered inadequate by a large majority. Regarding the systems and policies under which the KCC is working, there is substantial dissatisfaction with nearly 85 percent putting it in the range of poor to satisfactory. However, over 74 percent indicate the usefulness of the KCC to the farmers as good to excellent, and all FTAs believe that the KCC scheme should continue for the benefit of the farmers.

Farmers' Survey Findings

- A sample of 120 farmers including 98 KCC user and 22 non-user were surveyed in the study. The users were found to be somewhat more educated and somewhat younger than non-users, though many illiterate and older farmers were also using the KCC. Comparing different sources of information used based on the user sample, the results indicate that, KCC have risen to be frequently or very frequently used by 60 percent of the farmer users and extension worker at 80 percent, which is the highest among all the sources. This is followed by input dealers which stand at 49.40 percent and cooperative societies at 41.18 percent. This shows that Kisan Call Centres have done well but still have scope for improvement. In terms of the quality/ usefulness of the information the highest average score is obtained by extension worker. 4.13 out of 5, and the Kisan Call Centre stands at 3.54. Though this is higher than all other sources such as input dealers, KVKs, universities, or other call centres, there is considerable scope for improvement.
- Results show that on an average a user made 30 calls per year to the KCC, which is about 2-3 calls per month. The results indicate that the the average waiting time is

2.2 minutes per call. The percentage of calls not answered was 10.2, calls dropped was 5.8 percent, and calls where no proper answer was given was 13.5 percent. On the whole the users reported that the calls that were effectively answered were only 45.7 percent. The data indicates that the call efficiency is not satisfactory and there is considerable scope for improvement. 92 percent of the user's find the KCC toll free number easy to reach and 73 percent find the waiting time not too long. Over 70 percent report that the FTAs understand the questions or problems easily and provide answers in a clear and understandable way. The usefulness of the answer and solving the problem, the percentage is 72.

- On technical information, 91 percent farmers indicate that this information is easily available from KCCs, but only 67 percent find it reliable and useful, 56 percent find it up to date, and only 54 percent report that it improves the profit or performance – overall satisfaction reported 69 percent. On weather, 76 percent indicate that the information is available easily, but only 50 percent find it reliable, helpful and up to date, and only 45 percent say it improves profit or performance - overall satisfaction 51 percent. With respect to prices and market information only 10.5 percent are satisfied, and only 15 percent indicates that it improves performance or profit. On government schemes, 43 percent are satisfied, and 40 percent indicate that it improves performance or profits. Thus, there is considerable scope for improvement in the content and quality of the information provided through KCCs.
- In the overall assessment, the majority of farmer users report the performance of KCC to be good. Nearly 52 percent find the call response efficiency to be good to excellent, and on quality of the information, 33 percent consider it to be good (Fig. 5). About 97 percent of the farmers – a huge majority, find the KCCs useful, and despite some weaknesses, they definitely want the Kisan Call Centres (KCCs) to continue.

Recommendations

- In a short span of years, the Gujarat KCC is becoming a very frequently used source of information by the farmers, exceeding input dealers, KVKs and universities. This is a significant achievement, though there is scope for improvement. The Gujarat KCC system is receiving a huge amount of call traffic from the farmers of about 2.3 lakhs per year. 97 percent of the farmer users want the KCC scheme to continue.
- There is great need to further enhancing the use of the KCC system, and for this strong publicity to the farming community should be done to increase awareness

about KCCs, how they can help, and how to reach them, so that the user base and the call frequency can be greatly increased.

- There is great need to regularly monitor the call efficiency statistics of the KCC and seek to reduce the waiting time, the calls not answered, the call drops, and to increase the percentage of calls effectively answered.
- The latest hardware and software for call handling & filtering and excellent internet connectivity is a must for the FTAs and should enable the use of photographs, useful Apps and other means of communication between the farmers and FTAs. There is also a significant need to improve the functioning of the supporting websites including the KKMS, Farmers Portal and the m-Kisan Portal.
- There are substantial inadequacies in the quality of information provided by the KCC. The information base available with the KCCs/ FTAs to answer farmers' questions needs to be hugely improved – without this, the system will not be very useful and will not have much impact. The information needs to be made comprehensive, extensive and up to date and put into a quick access digital database system. A special Unit should be setup to build and maintain such a database.
- Escalation of questions to higher levels is not working in Gujarat KCC. A special in-house Unit of experts should be setup in KCC to continuously access, compile, and update the required knowledge base and provide it to the FTAs. The unit could consist of qualified experts or even of qualified or experienced FTAs who are dedicated to this task. They should create, build and maintain the quick access digital database for the FTAs mentioned above.
- Weather information is a major reason for calling and this information should be substantially strengthened and kept up to date. The information on government schemes is another major reason for calling and needs considerable strengthening. Technical information needs improvement and there is strong need to strengthen the price and market information database.
- Frequent and good training programmes for the FTAs are a must to regularly enhance their skills and knowledge include in system operation, and new/ better sources of information, and updating of information including on government schemes.
- Given the availability of good long-distance telecommunication technology and its

growing reach, having a Centre may not be necessary – a limited number of well manned, well equipped and high expertise Centre may be better than many thinly or poorly manned Centre. There may not be a need for highly local Centre – in fact, larger aggregate Centre would better be able to share knowledge & solutions across areas/ regions.

- The FTAs play the most important role in the KCC system and need to be well compensated and supported. There is need to provide good office infrastructure facilities and create a good working environment for them, and the terms and compensation of FTAs need to be enhanced to attract the best talent, motivate them, get the good performance, and retain them. They play the most important role in helping the farmers and delivering the KCC service.



CHAPTER 1

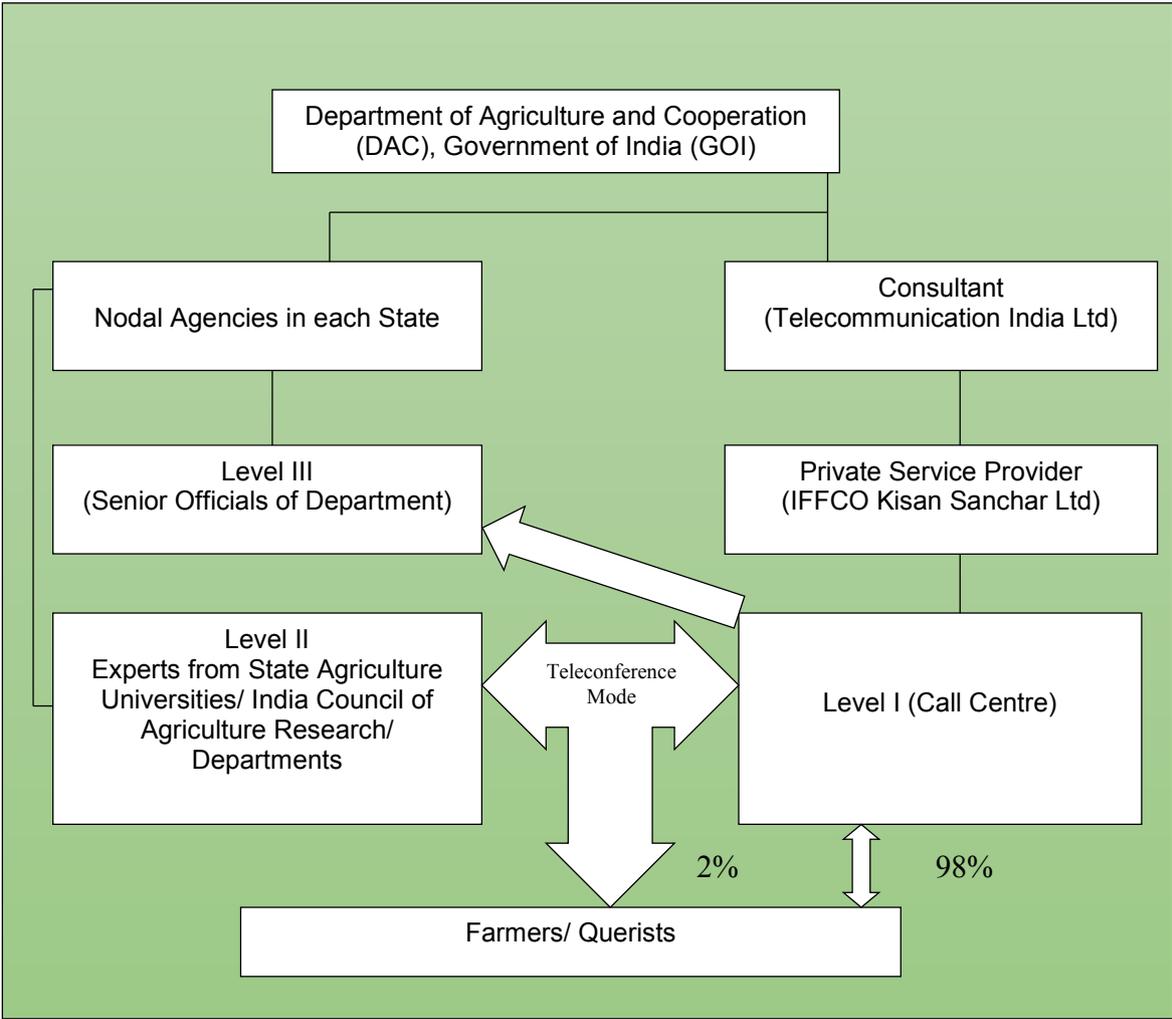
Introduction and Background

The Department of Agriculture & Cooperation, Ministry of Agriculture, Govt. of India launched *Kisan Call Centres* in 2004 with the objective of better delivering the extension information and services to the farming community by leveraging the extensive telecommunication infrastructure in the country. The role of these Kisan Call Centres (KCCs) is to respond on the spot to questions related to agriculture asked by farmers, in the local language and on a continuous basis. The aim was to serve the farmers in the entire country, in all the major languages through a network of Call Centres with information and advice related to agriculture. A toll-free number 1551 was designated for this.

In the planned structure, see Figure 1.1, the farmer reaches a farm tele advisor (FTA) in the KCC, typically an agriculture graduate or knowledgeable person, who would be able to respond to their queries and problems. In case the respondent at this Level-I is not able to satisfy the farmer, the call is taken on a conference to an expert at Level-II sitting in a specified place in the State in an institution for giving advice. It is envisaged that in the event where the farmer is not fully satisfied, his problems would be recorded, solved at Level-III at the highest level at the Nodal centre and he may get further advice through post or by the visit of extension worker. The services are to be made available round the clock. While during the working hours there would be an immediate response, but beyond working hours and on holidays, the call would be recorded and the queries answered later or by post. The network was launched and made available from 21st January 2004 throughout the country.

It has been reported that about 144 Call Farm Tele Advisors (FTA) are engaged in 25 KCCs for answering farmers' queries in 22 local dialects from 6 am to 10 pm on all 7 days a week. All KCC locations are accessible nationwide by dialling a single toll-free number 1551, and 1800-180-1551 (from 13th Feb. 2009). The numbers are accessible through landline and mobile phones of any service provider. The reply is given in the local language. The service is available from 6 am to 10 pm i.e. 16 hours a day. It is open 7 days a week 365 days a year. The purpose of this study is to provide an in-depth evaluation of this system and its experience, examining the structure, benefits, problems and identifying recommendations for the future.

Figure 1.1: Kisan Call Centre (KCC): Overall Flow Chart



Source: *Kisan Call Centre: Overall Flow Chart* [ONLINE]. Available at: www.mkisan.gov.in [Accessed 1 March 2016].

The Need for a Strong Information System for the Farmers

To manage their farms successfully in the world today, farmers frequently need information on a substantial number of technical, operational and economic matters. The information helps them to make correct decisions on various critical matters such as what crop to plant, the variety to use, the inputs to apply, and practices to follow, including how, how much and when, for the best productivity and returns. With rapid development and scientific progress, the number of choices available and the knowledge-base of agriculture has expanded tremendously, making decision-making more complex and difficult. Further, market liberalization, globalization and climate change are resulting in growing variability/ volatility including in the agro-climatic environment and the markets, thereby substantially increasing the risks and making the consequences of wrong decisions more severe.

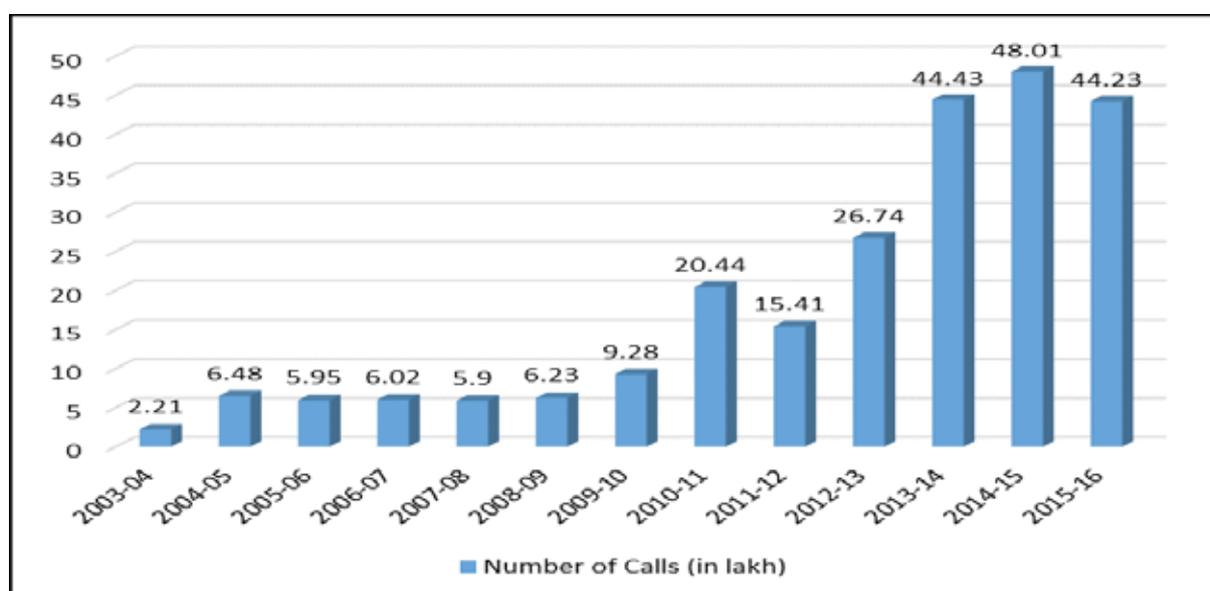
Farmers' livelihoods depend substantially on the decisions they make and therefore on the information available to them. The extension system which was supposed to play a leading role in informing and advising the farmers is under severe stress due to inadequacies of funds, personnel and design, and are frequently unable to perform. Thus, farmers are often poorly uninformed and the latest information and advice is not available to them. Deciding on hearsay information and input dealer advice often leads to imperfect decisions, poor crop performance, and even crop failure and suicides. Systems to provide best information and knowledge are therefore extremely crucial for the farmers as well as the agriculture sector and the economy as a whole. In this context, the recent developments in information and communication technology offer a great new way and opportunity and have been harnessed by the Government of India into the initiative of Kisan Call Centres (KCC), and related systems of Kisan Knowledge Management System (KKMS), Farmers Portal, and M-Kisan Portal. These have gradually grown into action since 2004. The present study seeks to examine the structure, implementation and performance of these systems.

Kisan Call Centres – Operation and Features

The Kisan Call Centres (KCC) started functioning from Jan 2004, with a common toll-free number 1551, and later 1800-180-1551 from Feb 2009. Recent reports indicate that 144 call centre agents were engaged in 25 KCCs answering queries in 22 different dialects from 6 A.M. to 10 A.M on all 7 days a week. The objective has been to provide the desired information free of cost to the farmers. Figure 1.2 shows trend in year wise number of calls handled since inception. Table 1.1 provides information on the number

of KCC calls recorded across the states in 2014-15, as well as the rural population, and number calls per lakh of rural population. They show that there was not much change in the number of calls between 2004/05 and 2008/09 but then there have been substantial increases in 2009/10 and 2010/11, and again a substantial jump in 2013/14. A major restructuring has been done in KCC after 2012-13. Contract was given to IFFCO-IKSL to manage KCC. The highest numbers of calls are seen among states such as UP, Maharashtra and Madhya Pradesh, and the lowest in the states such as Assam, Meghalaya, and Kerala. The highest number of calls per lakh of rural population in the larger states is seen among states such as Punjab, Haryana and Maharashtra, and among the lowest in states such as Assam, Bihar and many north-eastern states. Gujarat and Karnataka fall in the medium range both in the number of calls as well as the calls per lakh rural population.

Figure 1.2: Year wise Number of Calls received by KCC since Inception (January 2004 to March 2016)



Source: Based on www.mkisan.gov.in

Table 1.1: State-wise Number of Calls Registered under Kisan Call Centres (KCCs) and Kisan Knowledge Management System (KKMS) in India in 2014-15

Sr. No.	States/UTs	KCC Calls Registered	Rural Population	Calls per Lakh Rural Population
		2014-15	'000	2014-15
	Andaman and Nicobar Islands	40	244	16
	Andhra Pradesh	223929	56312	398
	Arunachal Pradesh	459	1069	43
	Assam	43204	26781	161
	Bihar	138198	92075	150

Sr. No.	States/UTs	KCC Calls Registered	Rural Population	Calls per Lakh Rural Population
		2014-15	'000	2014-15
	Chhattisgarh	61378	19604	313
	Dadra and Nagar Haveli	9	183	5
	Delhi	33139	419	7903
	Goa, Daman and Diu	109	612	18
	Gujarat	245713	34671	709
	Haryana	240654	16531	1456
	Himachal Pradesh	75298	6168	1221
	Jammu and Kashmir	108654	9135	1189
	Jharkhand	41571	25037	166
	Karnataka	249976	37553	666
	Kerala	28181	17456	161
	Lakshadweep	11	14	78
	Madhya Pradesh	417643	52538	795
	Maharashtra	598443	61545	972
	Manipur	1762	1900	93
	Meghalaya	791	2369	33
	Mizoram	364	529	69
	Nagaland	345	1407	25
	Odisha	252649	34951	723
	Punjab	287731	17317	1662
	Rajasthan	408322	51540	792
	Sikkim	2667	456	585
	Tamil Nadu and Puducherry	222972	37584	593
	Tripura	4418	2710	163
	Uttar Pradesh	753842	155111	486
	Uttarakhand	46132	7026	657
	West Bengal	306992	62214	493
	India	4795596	833088	576

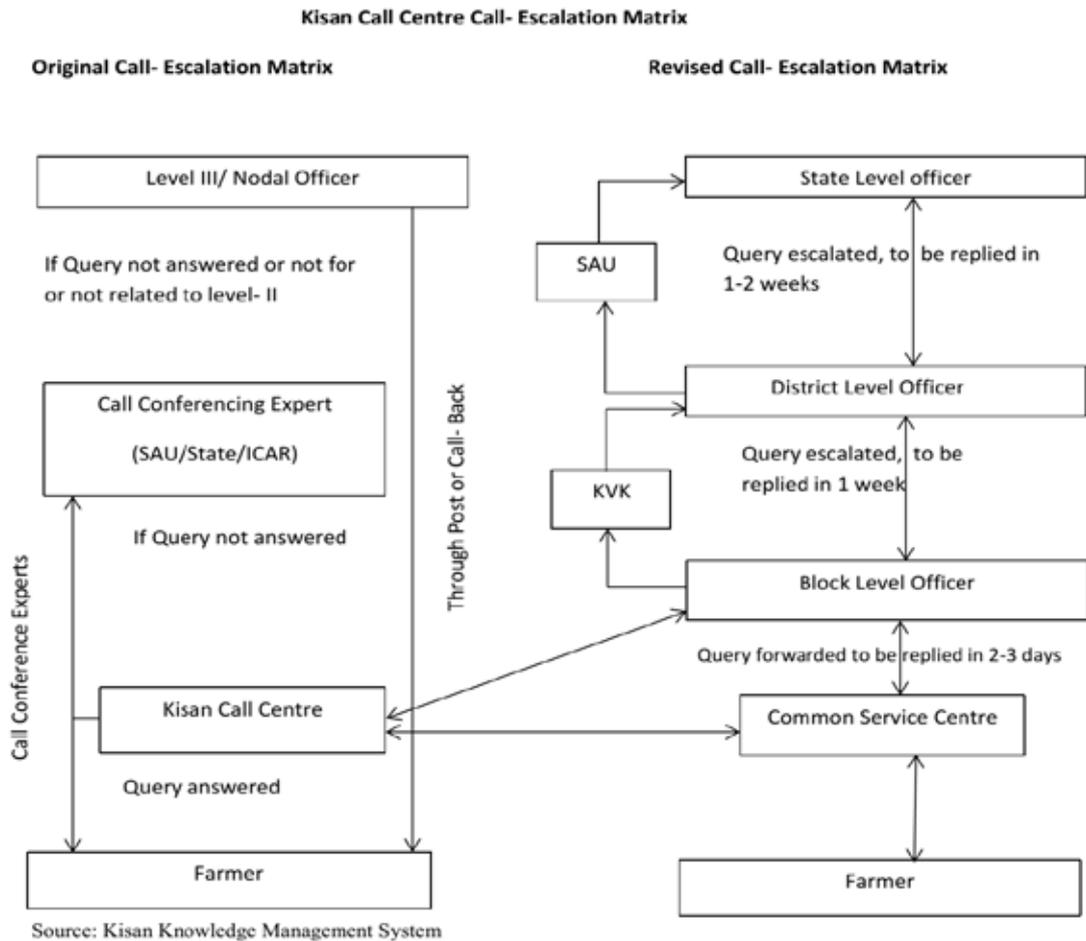
Source: Based on www.mkisan.gov.in, and Ministry of Agriculture 2014

The original design and the restructured design for processing of calls is described in the flow chart in Figure 3 below. In the original design, as described above, the farmer reached a call centre person (usually an agriculture graduate or expert) who responds to his/her queries and problems. If the respondent at this Level-I is not able to satisfactorily answer, the call may be taken on a conference call with an expert at Level-II in an institution in the state for handling and giving advice. Even then if the

farmer is not fully satisfied, the problems is recorded and then addressed at Level-III, the highest level called the Nodal Centre and further advice is given through post or by visit of an extension worker. The service is available round the clock. During the working hours there is immediate response, but after working hours and on holidays, the call is recorded and the queries answered later or by post. (Presently, KCC runs even on holidays).

However, the call escalation process has been restructured from April 2011, and it now said to involve (i) the State Agriculture Department from the block level to the state level, (ii) State Agriculture Universities (SAU), and (iii) Krishi Vigyan Kendras (KVK). When the KCC agent is not able to answer farmer's question, then experts from these organizations are connected through conference call. Involvement of Common Service Centres (CSCs) and other stakeholders is also envisaged. In the revised plan, since Level II of the escalation after KCC is at the block Level, it is necessary to have at least one expert on each speciality/sector in every block. Decentralization to the block and district level is required through identifying one officer in each sector at the district and block levels. The District Level Designated Officers (DLDOs) in every district needs to be enabled by State Level Designated Officers (SLDOs). The farmers can also visit the Common Service Centre (CSC) to get the answer to their queries. The CSCs may either answer the query by accessing relevant websites or escalate the query to higher levels as in case of KCC. The CSCs can also upload photographs along with description of the problem if the farmer comes with specimens of affected crops. A login interface is provided under the KCC Portal (www.dackkms.gov.in). Queries registered at the CSCs go through the same escalation matrix. The database of farmers' queries made at CSCs are also be available at KCCs and vice versa. Thus, a KCC agent can convey solutions to a CSC query by making an outbound call to the farmer. Figure 1.3 provides an outline of the original and revised KCC-KKMS system.

Figure 1.3: Original and Revised KCC matrix



Source: *Original and Revised KCC matrix* [ONLINE]. Available at: www.mkisan.gov.in [Accessed 1 March 2016].

Kisan Knowledge Management System (KKMS)

Kisan Knowledge Management Systems (KKMS) is the web portal system- application software which records detail of the registered farmer, the queries of farmer, and answers provided to them. The KCC agents or Customer Care Agents (CCA) can access KKMS over the internet, to find answers to queries from farmers. Available data in KKMS can help to identify and respond to the problems with solutions. Analysis of the KKMS data can help see the patterns and trends in the queries and responses. The data recorded in the KKMS has details available by states, districts, sectors, crops and topics.

Farmer's Portal - One Stop Shop for Farmers

A centralised knowledge base was first created purely from the farmers' perspective and was termed Farmers' Portal (www.farmer.gov.in) (in Beta version). Though over 800 websites of various central and state governments departments and organisations and 80 applications/portals existed, there was no one portal for the farmers. That was the genesis of the Farmers' Portal. The Farmers' Portal is an endeavour in this direction to create one stop shop for meeting all informational needs relating to agriculture, animal husbandry and fisheries sectors of an Indian farmer. With this the Indian farmer will not have to sift through maze of websites. Once in the Farmers' Portal, a farmer will be able to get all relevant information on specific subjects around his village/block /district or state enabled through a map of India placed on the home page. This information can also be delivered in the form of text, SMS, email and audio/video in the language he or she understands. Farmers can also ask specific queries as well as give valuable feedback through the feedback module. Considering popularity of the Farmers' Portal (of which SMS Portal is an integral part), as reflected in the tens of thousands of hits being received by SMS Portal everyday by the user department / organisations as well as farmers & other stakeholders, a new third level domain has now been created for all mobile based services for farmers on a unified portal which is www.mkisan.gov.in.

M-Kisan Portal - Mobile based Service for Farmers

As part of agricultural extension under the National e-Governance Plan - Agriculture (NeGP-A), various modes of delivery of services have been envisaged. These include internet, touch screen kiosks, agri-clinics, private kiosks, mass media, Common Service Centres, Kisan Call Centres, and integrated platforms in the departmental offices coupled with physical outreach of extension personnel equipped with pico-projectors and hand held devices. However, mobile telephony (with or without internet) can be the most potent tool of agricultural extension. As per TRAI data (May 2014), though there are about 38 crore mobile telephone connections in rural areas, internet penetration in the countryside is still extremely low - in single digit percentage. This makes mobile messaging a more effective tool to reach the 8.93 crore farm families. The m-Kisan SMS Portal was inaugurated on July 16, 2013, and since its inception nearly 92 billion SMSs have been sent by scientists, experts and officers to farmers by 2015. The mKisan SMS Portal enables all central and state government organizations in agriculture and allied sectors to give information and advisories to farmers.

Almost every government department, office and organisation from the ministry headquarters to the block level has been authorised to use this portal to provide information to farmers on a vast gamut of issues. Further, USSD (Unstructured Supplementary Service Data), IVRS (Interactive Voice Response System) and Pull SMS are included as value-added services which enable farmers to receive messages and also get web based services on their mobile without having internet. Semi-literate and illiterate farmers can be reached by voice messages. The messages can be specific to farmers' needs and often generate heavy inflow of calls in the Kisan Call Centres where people can get supplementary information. A key objective is to make SMS and other mobile based services a tool of 2-way communication in which information/advisory services are provided as per needs in a broadcast mode and farmer can also raise specific queries through KCC, Pull SMS or USSD.

Review of the Literature on IT Based Information Systems for Farmers

Cole and Fernando (2012) conducted a study on the impact of phone based agriculture extension services on productivity. This included a mobile based agriculture consulting service, Avaaj Otalo (AO), for cotton farmers in Gujarat, and the influence on decisions related to pesticide usage, investment, crop choice, and agricultural knowledge were examined. The study found substantial information inefficiencies and great demand for agricultural information. It found that AO resulted in farmers purchasing and applying more effective pesticides such as imidacloprid to treat sucking pests. However, some farmers continued to rely on local information from fellow farmers. Sharma, Singh and Sharma (2011) conducted a study on the role of Kisan Call Centres (KCC), examining the coverage and effectiveness of KCC in solving the problems of farmers in Himachal Pradesh covering the crops apple and tomato in high-hills and mid-hills. The farmers who used KCC grew their crops more scientifically and were found to have higher yields than those not availing the facility of KCC. Kant and Pandey (2015), in a study of KCC calls in Madhya Pradesh finds that according to the data, farmers face huge pest problems with kharif crops in the month of September and least in January. Most studies are state based and do not take into account the differences across states.

Kaushal (2015) reported that Kisan Call Centre (KCC) system is facing some problems due to lack of coordination between the government departments and KCC. Due to this, the latest market and other required information is sometimes not available from KCC resulting in lack of trust among the farmers. Bera (2014) reported that calls to KCC increase when there is a drought in the country and that due to shortage of staff many calls at KCC are unanswered. It also indicates that a large number of households are still

not very accustomed to the technology and may thus be left out. Chouhan, Kumar and Sharma (2011) conducted a study on calls received per month at the KCC of the Indian Society of Agribusiness Professionals Bhopal. The study revealed that most calls were for agriculture, followed by horticulture and the livestock. The calls for agriculture were on plant protection, production techniques, high yield variety seeds, marketing, and weather forecast. The study found that farmers sometimes have problems following recommendations due to complex scientific language used and the non-availability of recommended inputs in the local market. The study suggested that information should be provided appropriate to local farming system and on inputs available in the market. Rediff-News (2007) and Khanal (2015) also reported that farmers face problems in understanding the complex terminology in solutions conveyed by call centres.

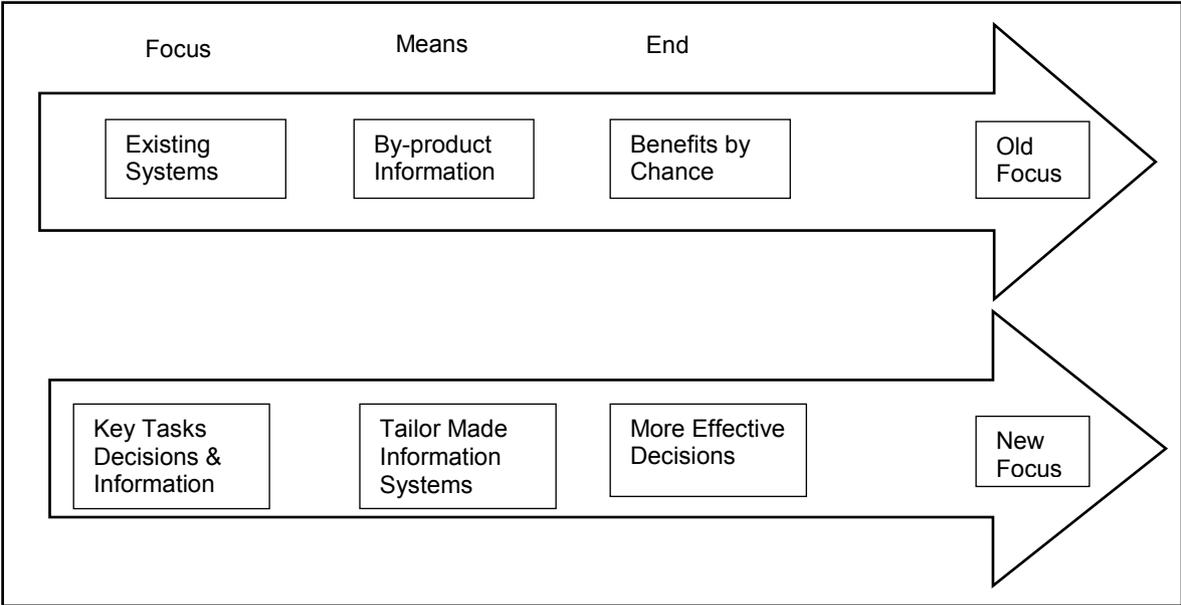
Aker and Mbiti (2010) studied that mobile phones are extending the reach of agricultural extension services in Kenya, Uganda and India, farmers can often call or send text to hotlines to ask for technical agricultural advice. McGuire, Bell and Crump, (2015) conducted a study to understand the effectiveness of agriculture call centres focusing on farmers' need for information, through farmer surveys in Ghana and Bangladesh, an audit of Esoko – a call centre based in Ghana, as well as inputs from call centres in other parts of Africa and Asia. Mobile company/ call centre software, platform management, databases, customer relationship management software, technical capacities, knowledge systems, product packages and experience of call centre operators were studied. Inconsistencies were found between the call centre's current activity and its capacity resulting in large differences in costs per call.

The Approach for Designing a Strong Information System

The approach for designing a strong information system for farmers can draw upon the conceptual framework for designing a good management information system for organizations derived from management theory. In the old/traditional approach, information was just a by-product of the operations, and was generated and passed along in a routinely, randomly or bureaucratically across the organization. Thus, it produced benefits only by chance (Fig 1.4). Decision-making generally remained ad hoc since the required information was not available where needed. In the modern approach for designing a good information system, the focus is on decision-making. The process begins by identifying the main objectives of the organization/ manager (such as profits or return-on-investment) and the strategy deployed to achieve these. This leads to the identification of key activities and tasks that need to be performed to achieve these objectives. Given this, the key decisions that need to be made are

identified followed by the key information needs for best making these decisions. This include not only the what, but also when, where and who of the key decisions. Finally, squarely based on the identified information needs, a tailor-made information system is designed, that can most effectively and directly provide the key information to the particular decision-makers. The result is an information system which is squarely focused on the key decision-making needs and would directly lead to better decision-making and performance (Laudon and Laudon 2002, Zani 1970, Gandhi 2004).

Figure 1.4: Design of Information Systems: Old and New Focus

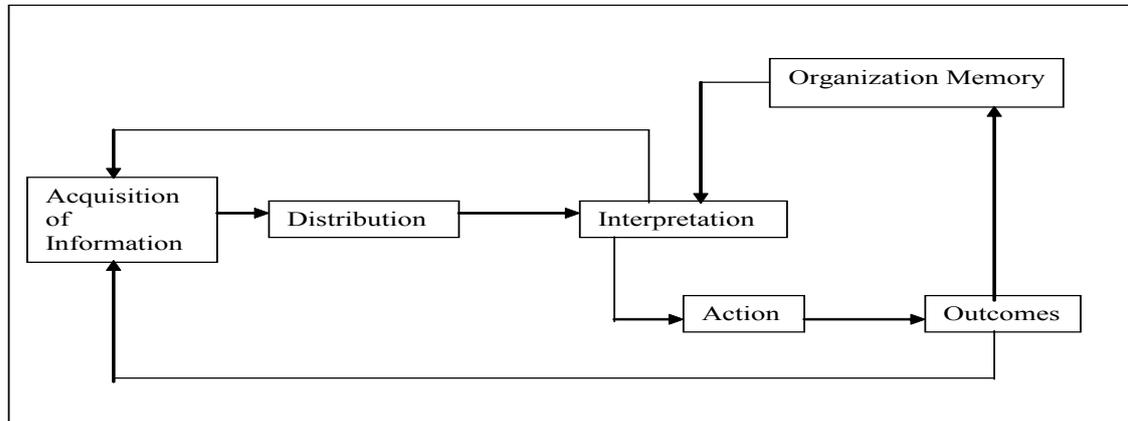


Source: Zani 1970, Gandhi 2004

It is also important to understand that the revolution in information technology is creating enormous stress in traditional organizations and systems. As information volume grows exponentially, and as its useful life shortens, organizations are being challenged to transmit information faster and learn more quickly. This means absorbing more information, making sense of it quickly, and sharing new insights so that decision-makers can act well and in time. For this, information has to be acquired, given meaning through interpretation, and then either acted upon immediately or properly stored in memory for later use (Figure 1.5) (Day and Glazer 1994). The process may be initiated by the acquisition of information through field sourcing, scanning, internet, experimentation, and field inquiries. The extent of learning also depends on how well the information is pieced together and how widely it is distributed. Before the information can be acted upon, it may have to be interpreted to reveal meaningful

patterns and relationships, so as to be able to facilitate the decision-making. These concepts set the agenda for a strong information system.

Figure 1.5: Information and the Organizational Learning Process



Source: Day and Glazer 1994

Objectives of the Research

The objectives of the research are to study the structure, design, implementation and performance principally of the government scheme of Kisan Call Centres (KCC), as well as examine the experience of related systems of Kisan Knowledge Management System (KKMS), Farmers Portal, and M-Kisan Portal. It seeks to examine their effectiveness in providing information and guidance to the farmers so as to help them with their important decisions and problems of agriculture, which would lead to better performance of their farms and the agriculture sector as a whole. More specifically, it will seek to examine:

1. The organizational setup, infrastructure, information & communication technology (ICT) and systems used, information content management, methods & information flows, types and abilities of the manpower involved, and the governance of the systems.
2. The record of the use of the systems – the profile and patterns of the users, the use made of the system including the number and nature of the calls and other means of communication, and the responses given.
3. The performance of the systems from the point of view of the farmers/users including the ease and usefulness of the systems, the decision-making and information needs of the farmers and the extent to which these are served - what they want and what they get.

4. How the systems can be improved to make them more effective in serving the farmers thereby enhancing farm performance, livelihoods and boosting the agriculture sector.

Coverage and Methodology

The study is conducted in coordination and cooperation with Agro Economic Research Centres (AERCs) in the different sample states. It is coordinated by Centre for Management in Agriculture (CMA), Indian Institute of Management Ahmedabad (IIMA).

Based on multiple relevant criteria such as geographic & agro-climatic diversity, known KCC system use level diversity, and the time and support availability across AERC/Us, the following five states/ Kisan Call Centres were included in the study sample: Punjab – Chandigarh, Gujarat – Ahmedabad, Maharashtra – Pune, Karnataka – Bangalore, and Assam – Guwahati..

The different states/ KCCs are covered by the respective AERCs, and Gujarat is covered directly by CMA. CMA has provided the overall coordination and consolidation work for the study.

The methodology provides for:

- Study of the structure and implementation of the systems in each state/centre.
- Examination of the service provider operation and profiling of the available user data, and calls/ use.
- Collection of user experience response through a sample survey of farmers, including examining their decision and information needs and satisfaction level.
- Obtaining user and service provider suggestions on areas and scope of improvement.
- Analyze the data through tabulation, distribution analysis, and other methods.
- Identify suitable operational and policy suggestions.

Special and separate survey instruments or questionnaires were designed for the survey of the Centres, the Farmer Tele Advisors (FTAs), and the farmers, based on the objectives and concepts of the study.



Chapter 2

Data and Sample Profile

Data: Gujarat Kisan Call Centre & Farmer Tele Advisor Survey & Profile

Based on relevant and multiple criteria including geographic and agro-climatic diversity, KCC system use levels, the following 4 districts were sampled and covered in the study sample (See Fig. 2.1)

- Banaskantha (North-east)
- Junagadh (South-west)
- Rajkot (South-west)
- Surat (South)

Figure 2.1: Survey Districts in Gujarat



The Table 2.1 below provides a basic profile of the Kisan Call Centre (KCC) in Gujarat that was covered in this study. The KCC surveyed covered 4 different districts with operations in 2 different languages in the state. The number of Farm Tele Advisors FTAs (Call Agents who respond to the calls) were 27 and 1 supervisor.

Table 2.1: Basic Profile of Kisan Call Centres Sampled in Gujarat

Sr. No.	Kisan Call Centre Location	States Covered	Local Language	FTA's	Center Super-visors	Total FTA's	Total FTA Surveyed in Study
1	Gujarat-Ahmedabad	Gujarat	Gujarati	27	1	27	27
		Daman & Diu	Gujarati/ Konkani				
		Dadra & Nagar Haveli	Gujarati				

In collecting responses from the FTAs, the plan was to cover about 30 FTAs in each Centre or all FTAs, whichever was greater. In the case of Ahmedabad all 27 FTAs were covered.

The Tables below provide a basic profile of the 27 FTAs sampled & surveyed. In Table 2.2 on the profile by gender, it is found that about 70 percent of the FTAs were male and 30 percent were female (Table 2.2). In terms of the education, Table 2.3 shows all FTAs were graduates with the maximum of 66.67 percent being of B.Sc. Agriculture background. This was followed by 18.52 percent having B.Sc. in Horticulture. 04 of the FTAs have Masters level qualifications constituting about 14.81 percent of the FTAs. Thus, it appears that almost all the FTAs are professional and well qualified for their jobs at the Kisan Call Centres.

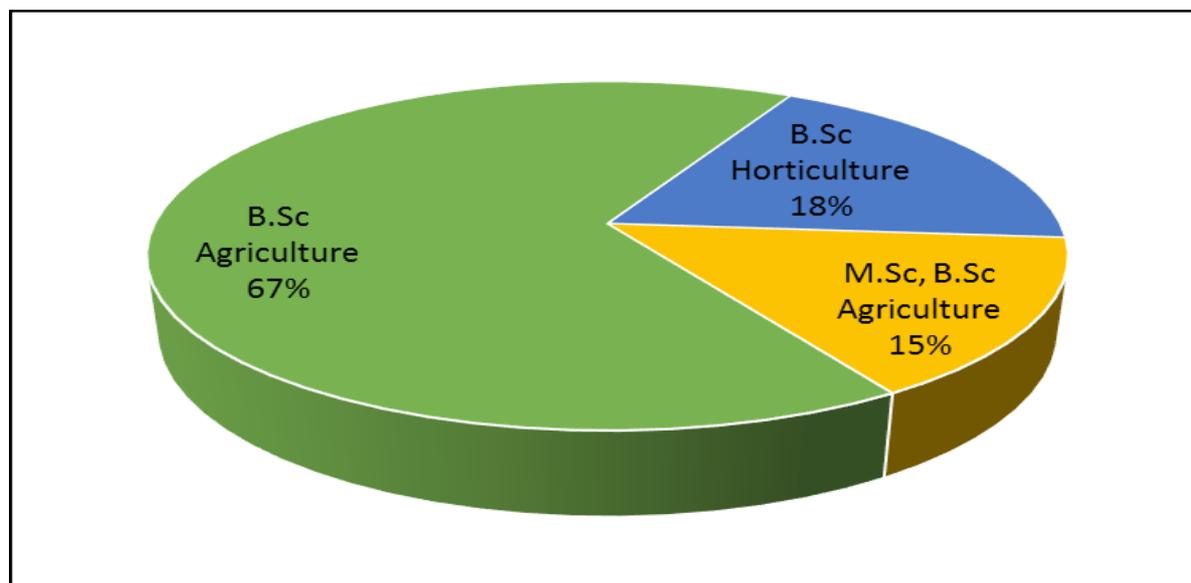
During the survey it was found that the FTAs having background in Horticulture and Animal Husbandry were very less, and queries related to these topics are quite frequent. FTAs have to transfer the calls to higher level which sometimes are unanswered.

Table 2.2: Gender Profile of FTA's surveyed

Gender	Number	Percent (%)
Male	19	70.37
Female	8	29.63
Total	27	100

Table 2.3: Education Profile of FTAs surveyed

Degree	Number	Percent (%)
B.Sc Agriculture	18	66.67
B.Sc Horticulture	5	18.52
M.Sc, B.Sc Agriculture	4	14.81
Total	27	100

Figure 2.2: Education Profile of FTAs surveyed

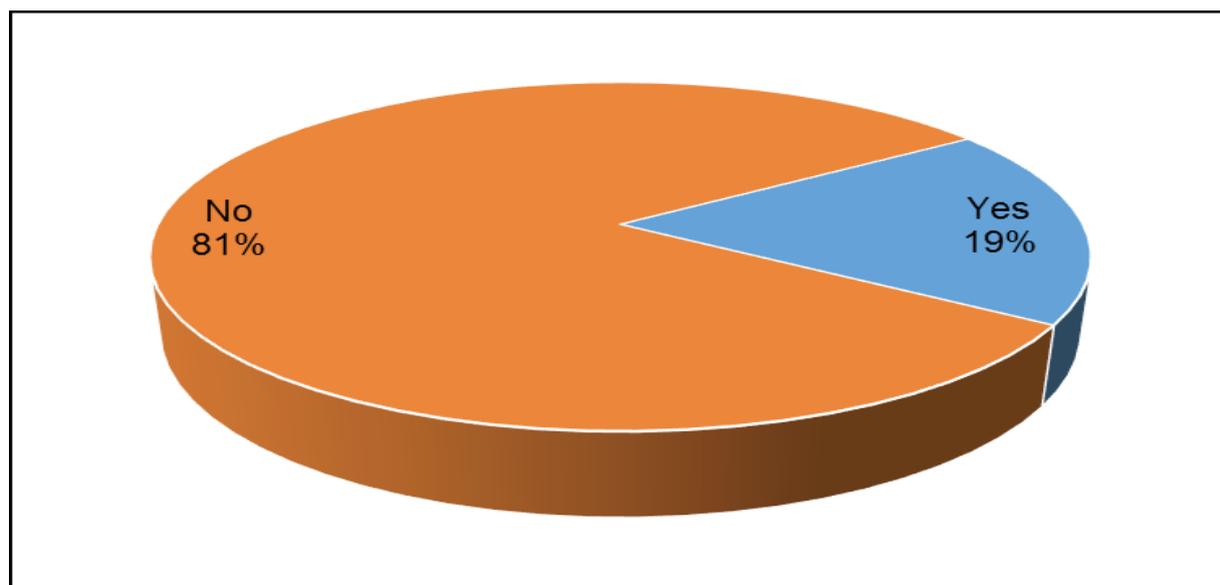
In terms of the subject of specialization, only 5 FTAs had specialization out of which 2 FTAs has Entomology as their specialization subject. Rest of the 3 FTAs had Agriculture Extension, Agriculture Economics and Agronomy as their specialization subject. In terms of work experience, 18.52 percent of the FTAs have work experience whereas 81.48 percent do not have any work experience and are fresh recruits from the universities. The kind of work experience is not known.

Table 2.4: Stated Subjects of Specialization of FTAs Surveyed

Subjects	Number	Percent (%)
Agriculture Extension	1	20
Agriculture Economics	1	20
Agronomy	1	20
Entomology	2	40
Total	5	100

Table 2.5 FTAs with Work Experience

	Number	Per cent (%)
Yes	5	18.52
No	22	81.48
Total	27	100.00

Figure 2.3: FTA's with Work Experience

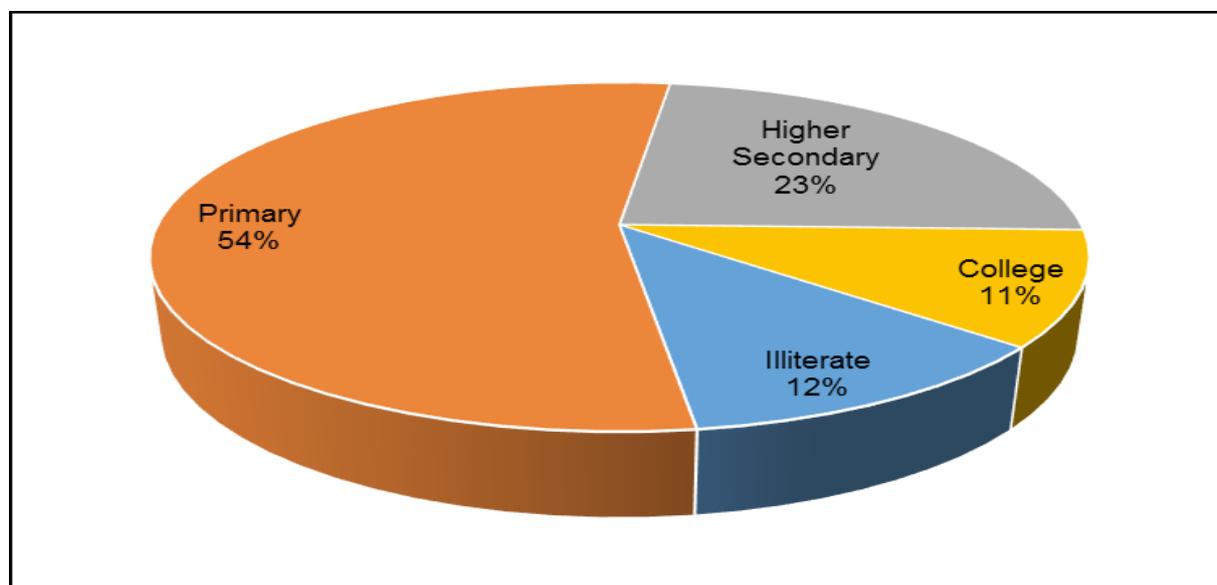
Data: Farmer Sample Survey & Profile

The sampling plan proposed the coverage of a farmer sample size of about 100 farmers per state including at least 80 users and about 20 non-users. The data was proposed to be collected from at least 2 diversely located districts per state and any number of villages (at least 2 or more) per district so that the necessary number of users and non-users can be identified and covered. Thus, from the Gujarat state, a total sample size of 100 farmers was planned to be covered, consisting approximately of 98 KCC users and 22 non-users.

The Table 2.6 below provides the education profile of the farmers. The Table indicates that 23 percent of the users had a higher secondary education, 54 percent had primary education, with 10 percent having been to college. The sample included 11.07 percent of illiterate farmers. Thus, many users appear to be educated, though even illiterate farmers are making use of the KCC service.

Table 2.6: Education Profile of Farmers (KCC user) sample

	Per cent (%)
College	10.06
Higher Secondary	23.04
Primary	54.03
Illiterate	11.07
Total	100.0

Figure 2.4: Education Profile of Farmers (KCC users)

The Table 2.7 below provides the caste profile of the sample. It shows that 7.22 percent belong to Schedule Tribes (ST), 30.93 percent belong to Schedule Castes (SC), 52.58 percent belong to Other Backward Castes (OBC), and 9.28 percent belong to other castes. The sample data indicates that the KCC users show a fairly wide and diverse social coverage and may be not too different from the proportions in the population. The age profile of the sample also shows a wide coverage with about 80 percent belonging to ages below 49 and the rest of 50 & above. (Table 2.8)

Table 2.7: Caste Profile of Farmer (KCC users) Sample

Caste	Per cent (%)
Others/General	9.28
OBC	52.58
ST	7.22
SC	30.93
Total	100

Table 2.8: Age Profile Sample Farmers (KCC users)

Age Group	Number	Per cent (%)
18-29	26	26.53
30-39	28	28.57
40-49	25	25.51
50-59	10	10.20
60 and Above	9	9.18
Total	98	100.00

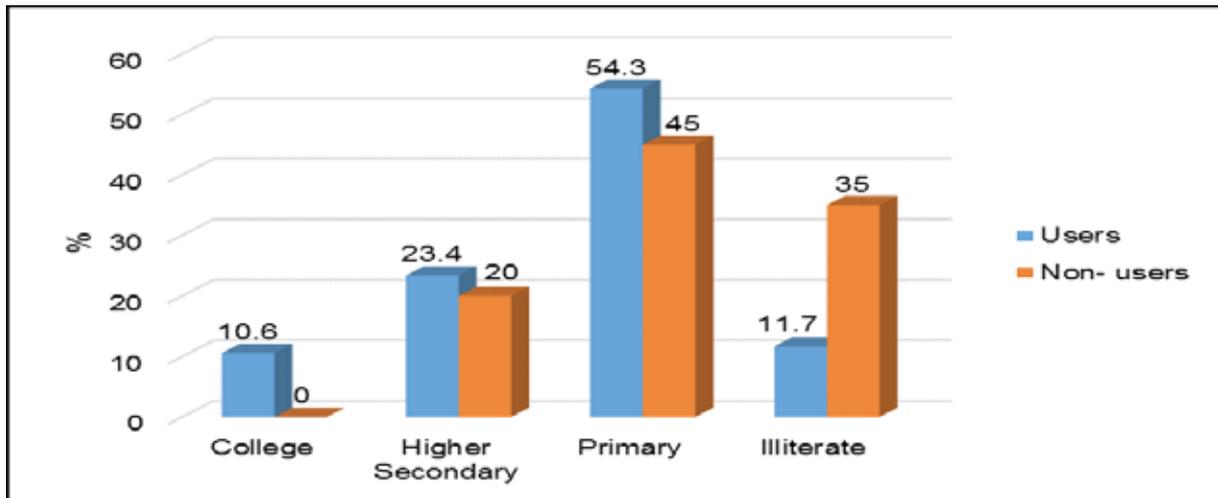
Non-users Sample

In the survey 22 non-users were covered in Gujarat. The non-users could not be asked the specific questions related to the experience with the KCCs but the responses were collected on the other questions.

The Tables 2.9, 2.10 and 2.11 below give the education, caste and age profiles of the non-users. About 45 percent of the non-users have education of primary or above and 35 percent are illiterate. By caste 31.82 percent belong to ST, 4.55 percent belong to SC, 59.09 percent belong to OBC, and 4.55 percent belong to other castes. By age profile, the sample shows a wide coverage with about 46 percent belonging to ages below 40 and the rest to 40 & above. The results very broadly show that the non-user sample is somewhat less educated. Thus, users are likely to be more educated. There is no clear pattern by age.

Table 2.9: Education Profile (Non-users)

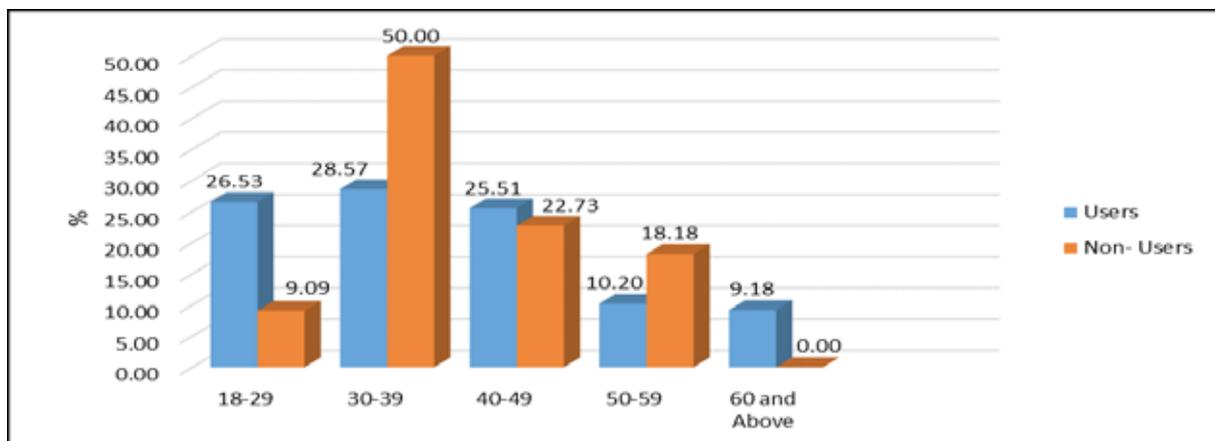
Education	Per cent (%)
Higher Secondary	20
Primary	45
Illiterate	35
Total	100.00

Figure 2.5: Education profile of Farmers**Table 2.10: Caste Profile (Non-users)**

Caste	Per cent (%)
Others/General	4.55
OBC	59.09
ST	31.82
SC	4.55
Total	22

Table 2.11: Age Profile Farmers (Non-users)

Age Group	Frequency	Per cent (%)
18-29	2	9.09
30-39	11	50.00
40-49	5	22.73
50-59	4	18.18
Total	22	100

Figure 2.6: Age Profile of Farmers (Users and Non-users)

Chapter 3

Study of the Call Information Recorded in the KCC-KKMS System

The calls received by the Kisan Call Centres (KCCs) are recorded in the KKMS system database by the Centres. Examination of the data indicates that in 2016-17, over 61 lakh live calls were received and recorded at the KCCs in the country, which is a huge number. In terms of total live calls Gujarat is at 2.3 lakh or 3.8 percent. Normalization was also done by the rural population and cropped area. With the normalization by rural population, Gujarat was at 13th rank with 672 live calls per lakh of rural population. In normalization by cropped area, the number of live calls per lakh hectares cropped area is 1903 calls in Gujarat with 20th rank. It indicates that there is scope and need to spread the use. The call densities indicate that there is also considerable scope for increasing overall call levels. (See Table 3.1)

Table 3.1: Calls Landed in the KCCs as Recorded in KKMS Database (FY 2016-17)

Sr. No	State	Live Calls	Live Calls%	Total Calls incl. IVRS	Total Calls %	Live Calls per Lakh Rural Population	Live Calls per lakh hectares Cropped Area	Total Calls per Lakh Rural Population	Total Calls per lakh hectare of Cropped Area
1	Uttar Pradesh	1273762	20.71	1274157	15.91	821	5018	821	5020
2	Maharashtra	770757	12.53	776389	9.69	1252	3202	1261	3226
3	Rajasthan	685490	11.15	685790	8.56	1330	2636	1331	2637
4	Madhya Pradesh	578275	9.4	1210440	15.11	1101	2623	2304	5491
5	Odisha	351098	5.71	351290	4.39	1005	6467	1005	6471
6	Haryana	317924	5.17	918208	11.46	1923	4887	5554	14115
7	Karnataka	288608	4.69	288735	3.6	769	2210	769	2210

Sr. No	State	Live Calls	Live Calls%	Total Calls incl. IVRS	Total Calls %	Live Calls per Lakh Rural Population	Live Calls per lakh hectares Cropped Area	Total Calls per Lakh Rural Population	Total Calls per lakh hectare of Cropped Area
8	Tamil Nadu	273947	4.45	274020	3.42	737	4762	737	4763
9	Punjab	273523	4.45	873765	10.91	1580	3470	5046	11084
10	Bihar	241698	3.93	241781	3.02	263	3360	263	3361
11	Gujarat	233097	3.79	233224	2.91	672	1903	673	1904
12	Andhra Pradesh*	349908	5.69	349964	4.37	621	2411	621	2412
13	West Bengal	131472	2.14	152630	1.91	211	1375	245	1596
14	Jammu and Kashmir	84468	1.37	84537	1.06	925	7409	925	7416
15	Himachal Pradesh	64003	1.04	64019	0.8	1038	6744	1038	6746
16	Chhattisgarh	59182	0.96	59234	0.74	302	1044	302	1045
17	Uttarakhand	38938	0.63	38962	0.49	554	3328	555	3330
18	Assam	37017	0.6	37036	0.46	138	890	138	890
19	Delhi	32044	0.52	32058	0.4	7642	72827	7645	72859
20	Jharkhand	28958	0.47	28964	0.36	116	2318	116	2319
21	Kerala	22011	0.36	22026	0.27	126	832	126	832
22	Tripura	5297	0.09	5297	0.07	195	1513	195	1513
23	Manipur	1883	0.03	1883	0.02	99	541	99	541
24	Puducherry	1407	0.02	1407	0.02	357	4539	357	4539
25	Meghalaya	1329	0.02	1331	0.02	56	393	56	394
26	Sikkim	1058	0.02	1058	0.01	232	696	232	696
27	Arunachal Pradesh	987	0.02	989	0.01	92	355	93	356
28	Andaman And Nicobar Islands	424	0.01	474	0.01	173	2232	194	2495
29	Nagaland	309	0.01	309	0	22	68	22	68
30	Goa	286	0	286	0	52	179	52	179
31	Mizoram	105	0	105	0	20	79	20	79
32	Chandigarh	88	0	88	0	303	4400	303	4400
33	Dadra and Nagar Haveli	8	0	8	0	4	36	4	36
34	Lakshadweep	4	0	4	0	28	133	28	133
35	Daman and Diu	2	0	2	0	3	67	3	67
	Total	6149367	100	8010470	100	738	3091	962	4026

Source: Kisan Knowledge Management System and Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi

The Table 3.2 below gives the calls recorded data for the five sample states. It indicates that 16 lakh calls or 26 percent of the live calls, and 22 lakh or 28 percent of the total calls are recorded in these states, indicating that it is a significant sample. Of the calls

in the sample states, the largest share in the live calls is that of Maharashtra at 48 percent share, followed by Karnataka at 18 percent. If total calls including IVR are considered, the largest share is of Punjab at 39.5 percent followed by Maharashtra at 35.1 percent. Assam in each case has the lowest share at about 2 percent.

Table 3.2: Calls Landed in the Sample State KCCs as Recorded in the KKMS Database (FY 2016-17)

Sr. No.	State	Live Calls	Live Call%	Total Calls Incl. IVR	Total Calls%
1	Maharashtra	770757	48.08	776389	35.14
2	Karnataka	288608	18.00	288735	13.07
3	Punjab	273523	17.06	873765	39.55
4	Gujarat	233097	14.54	233224	10.56
5	Assam	37017	2.31	37036	1.68
	Total	1603002	100.00	2209149	100.00

The crop or activity for which the calls were received in Gujarat KCC are also recorded in the data base. Data was obtained for the top 10 crops and then compiled and analyzed. The Table 3.3 below indicates that among these, Cotton (Kapas) has the largest share among crops with a share of 25 percent of the calls. This is followed by Groundnut (pea nut/mung phalli) with a share of 23.38 percent.

Table 3.3: Calls by Crop

Crop/Activity	Calls	
	Calls	%
Cotton (Kapas)	11282	25.00
Groundnut (pea nut/mung phalli)	10549	23.38
Cumin	6669	14.78
Coriander	2923	6.48
Wheat	2697	5.98
Chillies	2304	5.11
Bengal Gram (Gram/Chick Pea/Kabuli/Chana)	2243	4.97
Pigeon pea (red gram/arhar/tur)	2235	4.95
Black Gram (urd bean)	2132	4.72
Sesame (Gingelly/Til)/Sesamum	2095	4.64
Total (Top Ten Crops)	45129	100.00

The Table 3.4 below provides an analysis of the broad reasons for calling recorded for Gujarat state. It shows surprisingly that the highest number of calls recorded are for weather information, amounting to as much as 21.95 percent of the calls. This is followed by plant protection with the share of 20.41 percent. It indicates that weather

and plant protection are major concern of the farmer and KCCs are looked upon as an important source of information. The results indicate that there is great need to strengthen weather related information and plant related to information availability at the KCCs.

Table 3.4: Calls by Topic-Wise - Agriculture Related Topics

Sectors and Topics	Total Calls	% of calls from Total Calls
Agriculture Related Topics		
Weather	26656	21.95
Plant protection	24791	20.41
Cultural practices	19151	15.77
Government schemes	18176	14.97
Field preparation	7176	5.91
Fertilizer use and availability	5081	4.18
Market information	4522	3.72
Varieties	4231	3.48
Weed management	2616	2.15
Sowing time and weather	1933	1.59
Seeds	1592	1.31
Water management	1320	1.09
Agriculture mechanization	907	0.75
Nutrient management	822	0.68
Training and exposure visits	626	0.52
Soil testing	559	0.46
Crop insurance	399	0.33
Organic farming	286	0.24
Bio pesticides and bio fertilizers	222	0.18
Credit	185	0.15
Powers, road etc.	71	0.06
Storage	67	0.06
Post-harvest preservation	51	0.04
Total Calls	121440	100.00

Chapter 4

Results: Kisan Call Centres – Centre Survey

The Kisan Call Centres that were covered in this study sample includes those located at Gujarat-Ahmedabad. The information provided in this section is based on the responses of the Supervisor of the Kisan Call Centre.

The Ahmedabad-Gujarat Centre covers Gujarat and Daman & Diu. It works in single languages that is Gujarati. Total FTAs working in Gujarat KCC are 27 at the time of survey. (See Table 4.1)

The Gujarat Centre started in 2004 and relocated in 2012. The number of FTAs increased from 6 to 27. The KCC have undergone a process of development, with major changes especially in 2012. (See Table 4.2)

Responses on comparing the past call centre to the present call centre, the call centre strongly agree or agree that the change brought about better hardware, better connectivity, better software, and better ability to respond to farmers' calls. Thus, there substantial improvements seem to have taken place after the changes were undertaken over time and especially in 2012. (See Table 4.3)

Table 4.1: Profile of Kisan Call Centre

	Gujarat
States Covered	Gujarat and Daman & Diu
Languages Used	Gujarati
Number of FTA's	27

Table 4.2: History of Development of Kisan Call Centre

	Gujarat	
	Location	
	1st	2nd (Present Location)
Year of Start/ relocation	2004	2012
Number of FTA's/ KCC Agents	6	27
Information & comments on equipment's & software used	Old systems were used. Calling and computers had different connections.	Latest technology and equipment are used with up to date hardware and software.

Table 4.3: Comparison of Present and Past KCC.

	Ratings
Better Hardware/equipment	5
Better Software	5
Better Connectivity	4
Better farmer database	4
Better ability to respond farmers calls	5

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

The call centre is equipped with personal computers, headphones, and printer/scanner. The Gujarat Kisan Call Centre have 12 personal computers each, which have all-in-one desktops of i3 or i5 type. The performance is found to be good in Gujarat. The headphones are Jabra headphones in the Centre and the performance of this has some problems since it is rated only satisfactory. The printer/scanner is HP LaserJet and the performance is found to be good. (See Table 4.4)

Table 4.4: Present Hardware Profile

	Type	No.	Rating
PC's	All in one Windows Processor-i3, i5	12	Good
Headphones	Jabra Headphones	10	Satisfactory
Printers and scanners	HP Laser Jet M1216	1	Good

The call handling softwares used are identified as Agent Openscape Contact Centre, Openscape Desktop and Real Time Viewer. Each of these softwares is found in all the call centres. The performance of the Agent Openscape Contract Centre software is found to be excellent. The performance of the Openscape Desktop and Real Time Viewer is found to be good and excellent. (See Table 4.5)

Table 4.5: Present Software Profile

Call Handling Softwares	Available	Rating
Agent Openscape Contact Centre	Yes	Excellent
Openscape Desktop	Yes	Good
Real Time Viewer	Yes	Excellent

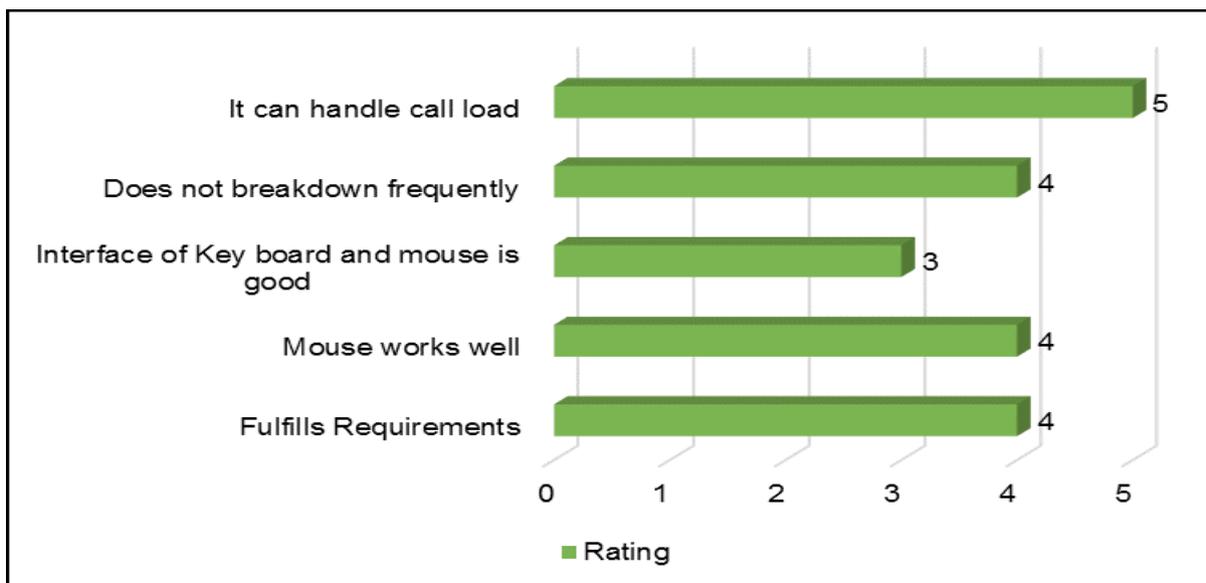
With respect to the performance of the hardware, the Centre strongly agree that it can handle the call load. In terms of breakdown, they do not find the breakdowns to be frequent. Gujarat report some problems in Keyboard and mouse interface. In general, however, the Centre agrees that the hardware fulfills the requirements. (See Table 4.6)

Table 4.6: Hardware Overall Ratings

	Rating
It can handle call load	5
Does not breakdown frequently	4
Interface of Key board and mouse is good	3
Mouse works well	4
Fulfills Requirements	4

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Figure 4.1: Hardware Overall Rating



Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

In terms of the performance of the software, the Gujarat Centre report that it can easily handle the call load including under heavy call traffic. Call drop and mishandling is not a problem. The data-base for answering question is reported to be adequate by

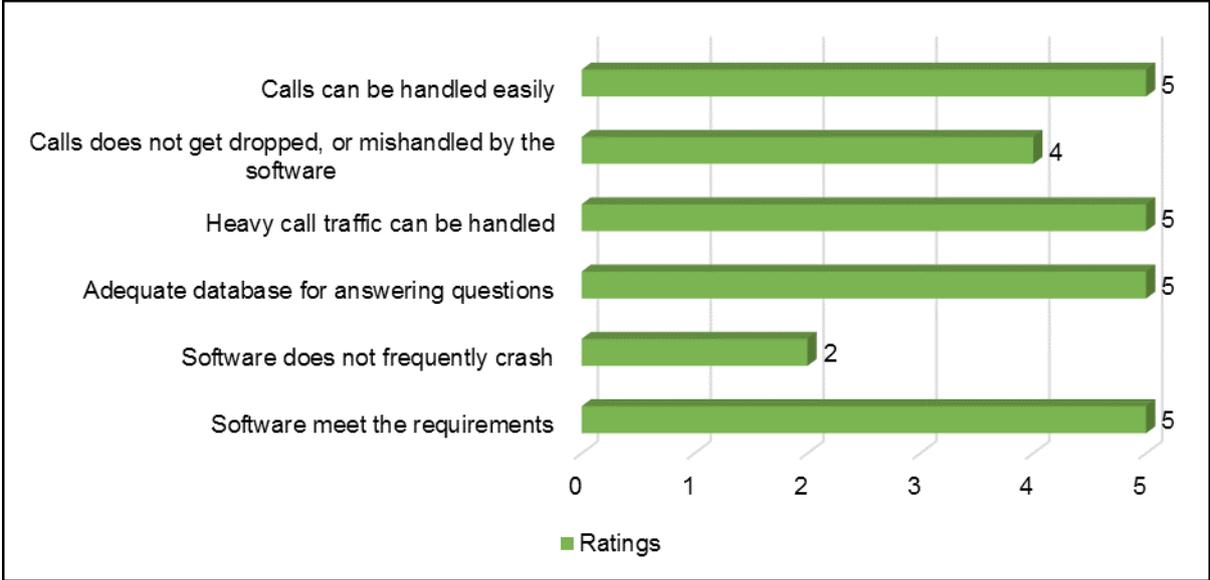
Gujarat Centre. The problem of software crashing is significant in Gujarat. Overall, all the centre find that the software generally meets the requirements. (See Table 4.7)

Table 4.7: Software Overall Ratings

	Ratings
Calls can be handled easily	5
Calls does not get dropped, or mishandled by the software	4
Heavy call traffic can be handled	5
Adequate database for answering questions	5
Software does not frequently crash	2
Software meet the requirements	5

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Figure 4.2: Software Overall Rating



Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

The Tables 4.8 and 4.9 below indicate that when hardware or software problems are faced, the Centre solve them either by themselves or through IT experts.

Table 4.8: How do you Resolve Hardware Problem?

Gujarat
Self or IT Expert

Table 4.9: How do you Resolve Software Problem?

Gujarat
IT Expert

Regarding internet connectivity, it is reported that it slows down during heavy call load and is not fast enough to respond to calls and retrieve and record information. It also

breaks down frequently and this not found to be adequate for work. (See Table 4.10). This is not reported to be satisfactory and there is substantial scope for improvement.

Table 4.10: Internet Connectivity

	Ratings
During heavy call loads, internet does not slowdown	2
Fast enough to respond calls	2
Fast enough for retrieving & recording information	2
Does not frequently breakdown	2
Adequate for work	3

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Gujarat Call Centre have 2 air conditioners and CCTV cameras installed. Drinking water and washroom facility are also reported by all the Centre. However, the centre has no food catering facility. In terms of adequate ventilation, the centre is reported to be satisfactory Overall, the work environment is reported to be satisfactory, and there is scope for improvement. (See Table 4.11 and 4.12)

Table 4.11: Infrastructure/ Office Equipment

Facilities	No.
No. of AC's Installed	2
No. of CCTV Cameras	2
Drinking Water Facility	1
Washroom Facility	1
Lunch/Dinner Facility	0

Table 4.12: Infrastructure Rating

	Rating
Sufficient Activity Area	5
No disturbance while other FTA are attending call	5
Adequate Ventilation	3
Sufficient Video Surveillance	5
No Disturbance from other departments	5
Overall good working environment	3

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

The FTAs play a most important role in the performance of the Gujarat Kisan Call Centre. The Table 4.13 below presents the responses of the Centre supervisor regarding the abilities and activities of the FTAs. The responses indicate that, the FTAs are reported to be quick in responding to calls, manage the calls efficiently, and seem

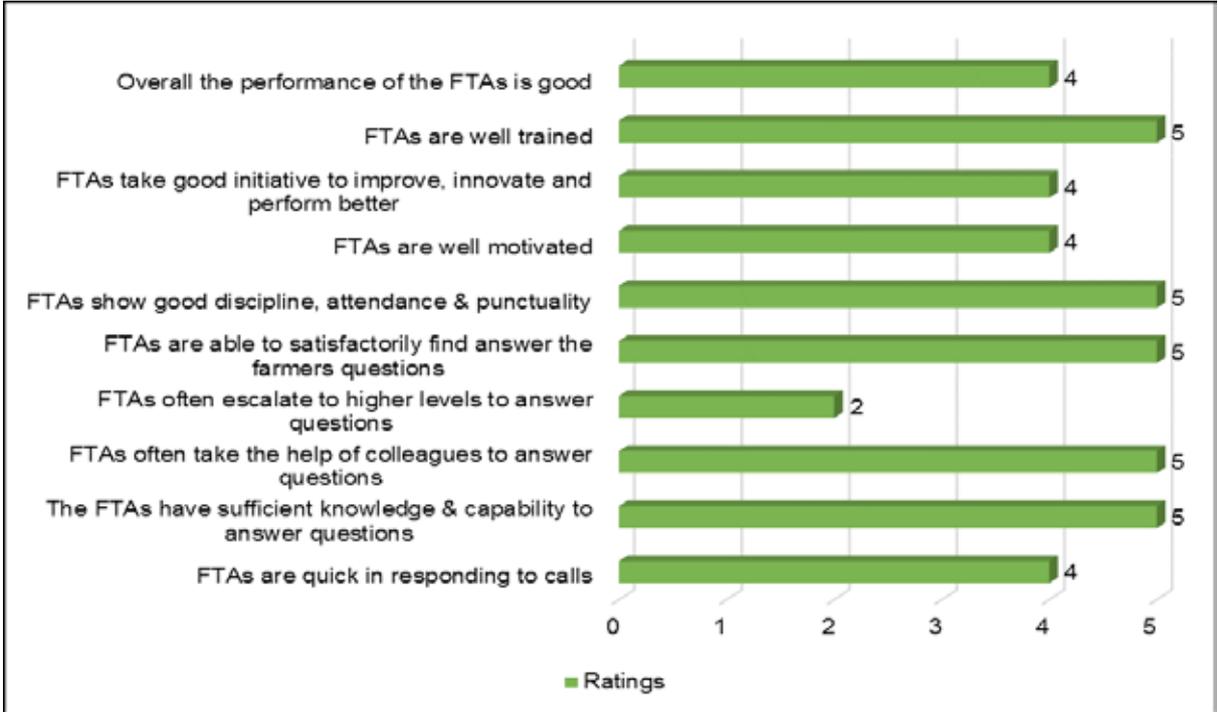
to have sufficient knowledge and capability to answer the questions. With respect to accessing the data-base to answer questions, their abilities are also reported to be good. In terms of escalating calls to higher level, most of the calls are attended and solved by FTAs or supervisors, so the escalation is quite less in higher level. Overall performance of FTA is reported to be good.

Table 4.13: Assessment of FTA Efficiency

	Rating
FTAs are quick in responding to calls	4
FTA’s are able to manage the calls efficiently.	5
The FTAs have sufficient knowledge & capability to answer questions	5
FTAs are able to quickly access the database/information to answer questions	4
FTAs often take the help of colleagues to answer questions	5
FTAs often escalate to higher levels to answer questions	2
FTAs are able to satisfactorily find answer the farmers questions	5
FTAs show good discipline, attendance & punctuality	5
FTAs are well motivated	4
FTAs take good initiative to improve, innovate and perform better	4
FTAs are well trained	5
Overall the performance of the FTAs is good	4

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Figure 4.3: Assessment of the FTA Efficiency



Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

To answer the questions of farmers, the FTAs use information and knowledge from self-knowledge, colleagues and supervisors prepared excel sheets, internet search and extension booklets and books. The most frequently used method is self-knowledge. The FTAs very frequently take the help of colleagues and supervisors. Prepared Excel sheets & materials, internet search, extension booklets, books, papers and government material are frequently used. The knowledge acquired in training is used less and the use of university experts and nodal officers is rarely or never used. Thus, the external sources are not working well.

Table 4.14: Assessment of Information & Knowledge Sources and Databases uses

(Frequency of Use)

	Ratings
Self-Knowledge	5
Colleagues & Supervisor	5
Prepared Excel sheets & material	5
Internet search	5
Extension Booklets, books, papers	5
Government department sources/material	5
Knowledge acquired in Training	3
University experts/Nodal officer knowledge	2
Information from other farmers	2

Scale: 5-Very Frequently, 4-Frequently, 3-Occasionally, 2-Rarely, 1-Never

In general, self-knowledge, colleagues and supervisors, prepared excel sheet, government material and internet search are considered good sources of information. Extension booklets, knowledge acquired in training and information from other farmers are considered satisfactory (Table 4.15), with scope for improvement.

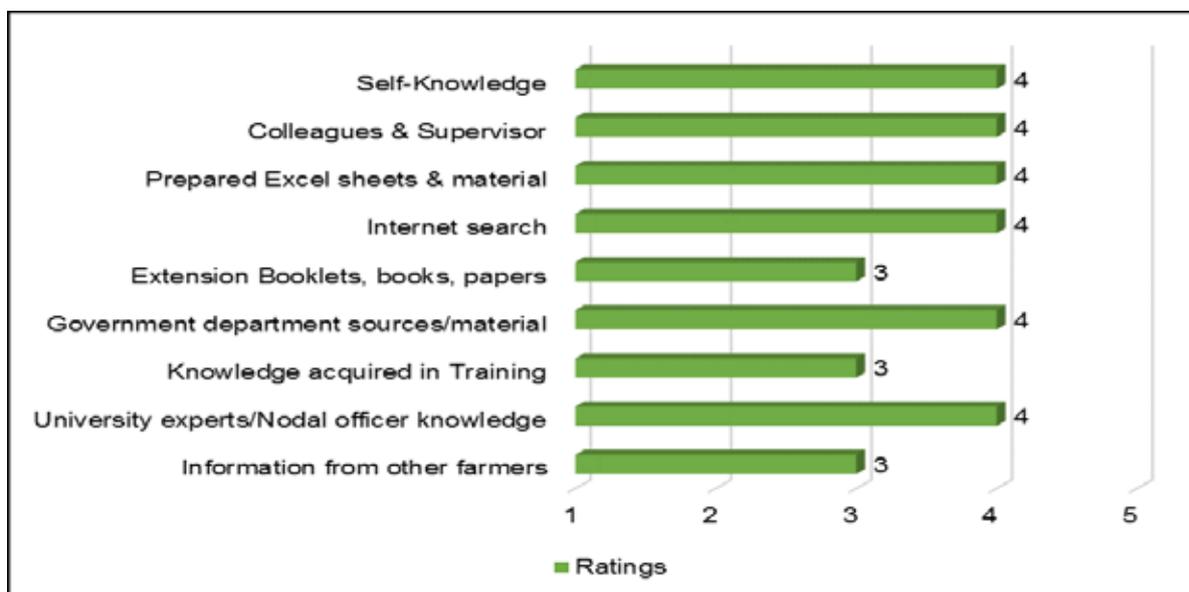
Table 4.15: Assessment of Information & Knowledge Sources and Databases uses

(Rating)

	Ratings
Self-Knowledge	4
Colleagues & Supervisor	4
Prepared Excel sheets & material	4
Internet search	4
Extension Booklets, books, papers	3
Government department sources/material	4
Knowledge acquired in Training	3
University experts/Nodal officer knowledge	4
Information from other farmers	3

Rating Scale: 5-Excellent, 4-Good, 3-Satisfactory, 2-Somewhat poor, 1-Very Poor

Figure 4.4: Assessment of Information & Knowledge Sources and Databases uses
(Rating)



Rating Scale: 5-Excellent, 4-Good, 3-Satisfactory, 2-Somewhat poor, 1-Very Poor

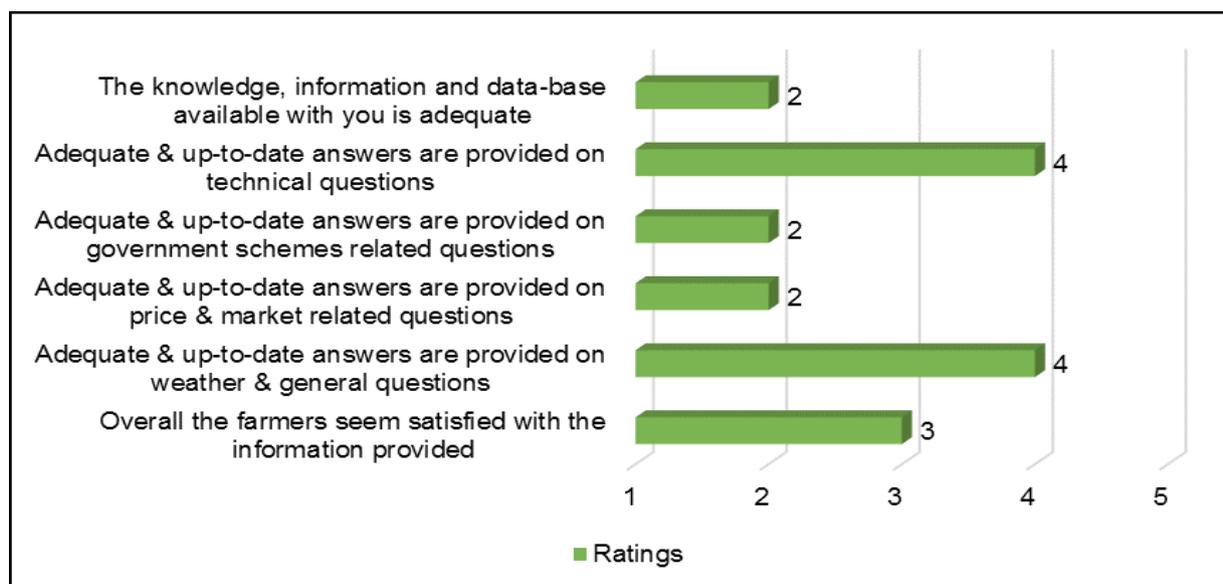
The knowledge data base available is reported not satisfactory in Gujarat see Table 4.16 below. The technical questions are being adequately answered, the question related to government scheme and price and markets are generally not adequately answered. The weather related are answered well by the centre. Overall the farmers are reported to be less satisfied with the information provided.

Table 4.16: Overall Assessment of Information Provided

	Ratings
The knowledge, information and data-base available with you is adequate	2
Adequate & up-to-date answers are provided on technical questions	4
Adequate & up-to-date answers are provided on government schemes related questions	2
Adequate & up-to-date answers are provided on price & market related questions	2
Adequate & up-to-date answers are provided on weather & general questions	4
Overall the farmers seem satisfied with the information provided	3

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Figure 4.5: Assessment of Information Provided



Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

The Table 4.17 below provides information regarding usage of different relevant websites by the Gujarat Kisan Call Centre. The Call centre are using the Kisan Knowledge Management System (KKMS), I-Kedut portal and State Seeds Corporation Ltd all the time. Whereas the farmers' portal is not being used by the FTAs.

Table 4.17: Websites used for Information Source (%) usage in Percentage of Time (%)

Websites	Ratings
Kisan Knowledge Management System	100
I-Kedut Portal	100
State Seeds Corporation Ltd	100
Farmer's Portal	0
Agricultural University Portal	0

With respect to the KKMS portal, the performance appears to be less than satisfactory as experienced by the call centre, see Table 4.18 below. It appears to be slow in response and frequently crashes or fails to respond. Overall the study finds difficulty with the KKMS portal. Regarding the farmers' portal, the Gujarat Kisan Call Centre is not using it. (See Table 4.19)

Table 4.18: Assessment of KKMS Portal

	Ratings
KKMS portal response is fast enough	3
KKMS portal does not fail to respond or crash during use	2
Overall KKMS portal works well	3

Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Table 4.19: Assessment of Farmer Portal Website

	Ratings
Website response is fast enough	Not Using
Website does not fail to respond or crash during the use	Not Using
Overall the website works well	Not Using

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Queries that cannot be solved by the FTAs are taken to colleagues and supervisors and if not solved then escalated to higher levels. The results in the Tables 4.20 and 4.21 below show that the answering by colleagues and escalation to supervisors is quite common. The escalation to level 2 is quite frequent. However, the response to queries raised to higher levels is not satisfactory. The escalation to level 3 is never or rarely done, in almost all the cases of escalation of queries, the response of the higher-level experts is not found to be satisfactory. This indicates that this part of the system is not working and the responsibility and action on answering farmers queries largely rest with the FTAs.

Table 4.20: Call Escalation System Frequency

	Ratings
1. Frequency of Level 1 calls	
Queries not solved by FTA's are answered by colleagues	5
Queries not solved by colleagues are answered by Supervisors	5
Queries not solved by supervisors are escalated to level 2	4
2. Frequency of Level 2 calls	
Frequency of calls escalated to level 2	4
Queries not solved in level 2 are escalated to level 3	1
3. Frequency of Level 3 calls	
Frequency of calls escalated to Level 3	1
Queries are solved at level 3	1

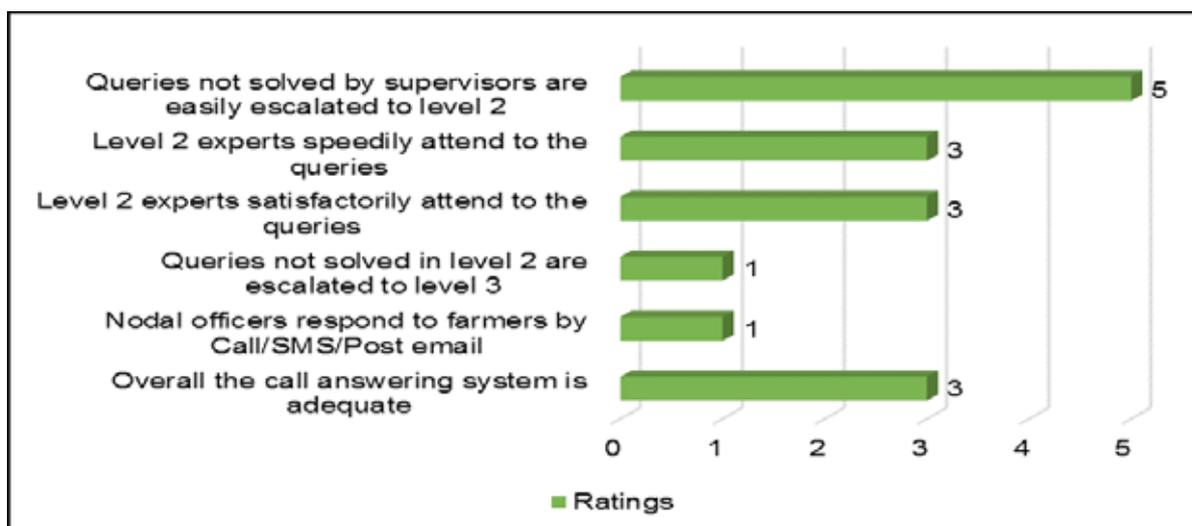
Frequency Scale: 5-Very Frequently, 4-Frequently, 3-Occasionally, 2-Rarely, 1-Never

Table 4.21: Assessing the Call Answering System Efficiency & Effectiveness

	Ratings
Queries not solved by supervisors are easily escalated to level 2	5
Level 2 experts speedily attend to the queries	3
Level 2 experts satisfactorily attend to the queries	3
Queries not solved in level 2 are escalated to level 3	1
Nodal officers respond to farmers by Call/SMS/Post email	1
Overall the call answering system is adequate	3

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Figure 4.6: Answering System Assessment



Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

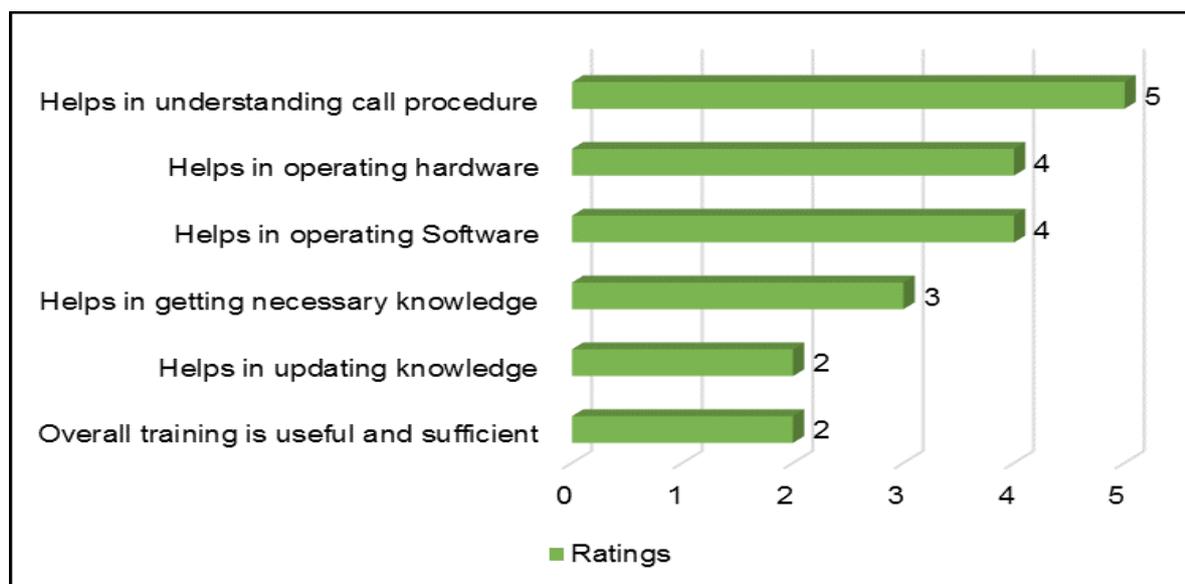
A number of training programmes are being conducted to train the FTAs in handling the calls. The Table 4.22 below indicates that experience regarding usefulness of the training is highly mixed and not very satisfactory in general. Training is helpful for learning the call procedure and the operation of the hardware and the software. It is not helpful in imparting the necessary or up to date knowledge. Overall the training is found to be insufficient.

Table 4.22: Overall Assessment of Usefulness of Training Programmes

	Ratings
Helps in understanding call procedure	5
Helps in operating hardware	4
Helps in operating Software	4
Helps in getting necessary knowledge	3
Helps in updating knowledge	2
Overall training is useful and sufficient	2

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Figure 4.7: Assessment of Training



Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

In overall assessment, the centre reports that a good number of calls are received every day. The call frequency is high before the Kharif season. The handling of the calls is intermediate in efficiency but the call system is good and the farmers and FTA have good communication. Overall farmers are reported to be satisfied with the call handling. (See Table 4.23)

Table 4.23: Overall Assessment of Call Handling

	Ratings
Large number of calls are received everyday	3
All calls are handled efficiently	2
Call handling system are good	4
Farmer & FTA have good communication	4
Overall the farmers are satisfied with call handling	4

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

The performance of the hardware is reported to be good and helpful. The performance of the software is less than satisfactory. The internet connectivity is found to be good. There is dissatisfaction with respect to infrastructure and service support. (See Table 4.24)

Table 4.24: Overall Assessment of Hardware, Software & Infrastructure

	Ratings
The performance of the hardware used is good & it is helpful	4
The performance of the software used is good & it is helpful	3
The performance of the internet connectivity is good	4
The infrastructure & service support is good	2

Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

In overall evaluation, the Table 4.25 below indicates that the required information is available on time. Even though the information provided is reported to be easy to understand, there are problems reported in terms of farmer understanding and processing of the information and farmer satisfaction with the information in general.

Table 4.25: Overall Assessment of the information & knowledge available

	Ratings
Information is available on time	4
Information available is easy to understand	5
Farmers can understand and process it easily	3
Farmers seems to be satisfied with the information provided	3

Opinion Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

The overall assessment as reported by the Centre supervisors, the performance of the KCC is reported to be good to excellent by all Centres, and own performance is reported to be excellent by all the centres. However, there is considerable dissatisfaction with respect to the systems and policies of the call centres and the ratings range from poor to satisfactory in this. The usefulness of KCC is reported to be good to excellent by all the centres, and all of them agree or strongly agree that the KCC should continue. (See Table 4.26)

Table 4.26: Overall Assessment

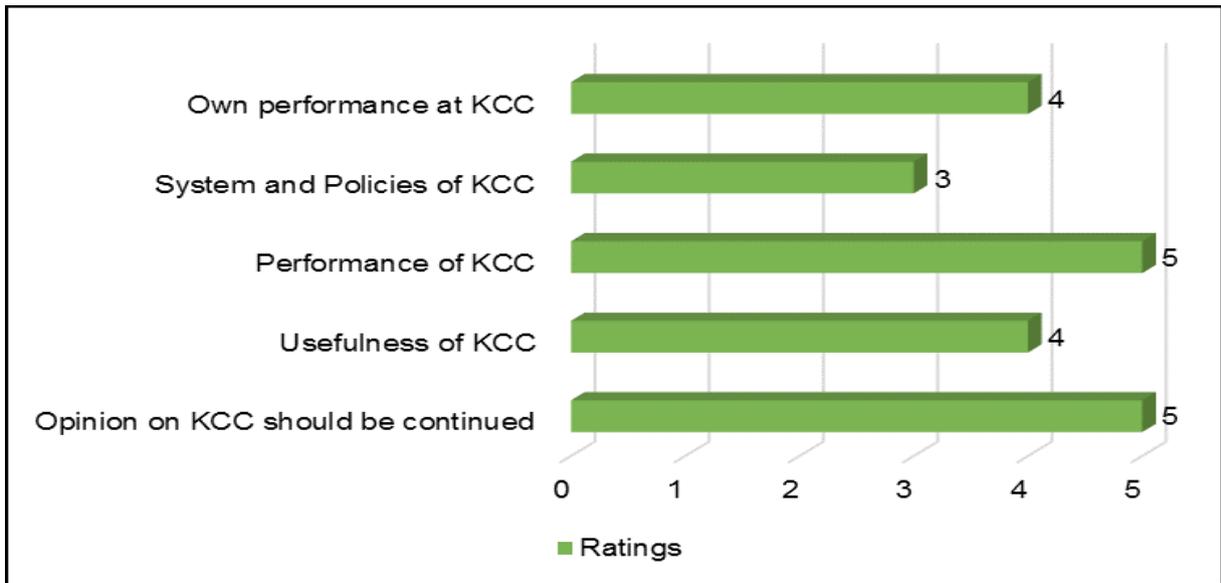
	Ratings
Own performance at KCC	4
System and Policies of KCC	3
Performance of KCC	5
Usefulness of KCC	4

Rating Scale: 5-Excellent, 4-Good, 3-Satisfactory, 2-Somewhat poor, 1-Very Poor

Opinion on KCC should be continued	5
------------------------------------	---

Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Figure 4.8: Overall Assessment



Rating Scale: 5-Excellent, 4-Good, 3-Satisfactory, 2-Somewhat poor, 1-Very Poor

*: Scale: 5-Strongly Agree, 4-Agree, 3-Partially Agree/Disagree, 2-Disagree, 1-Strongly Disagree

Chapter 5

Results: Farm Tele Advisors (FTA) Survey

As described above, the study surveyed all 27 FTAs. These FTAs actually receive and respond to the calls on a daily basis and their responses are from direct experience and are very important.

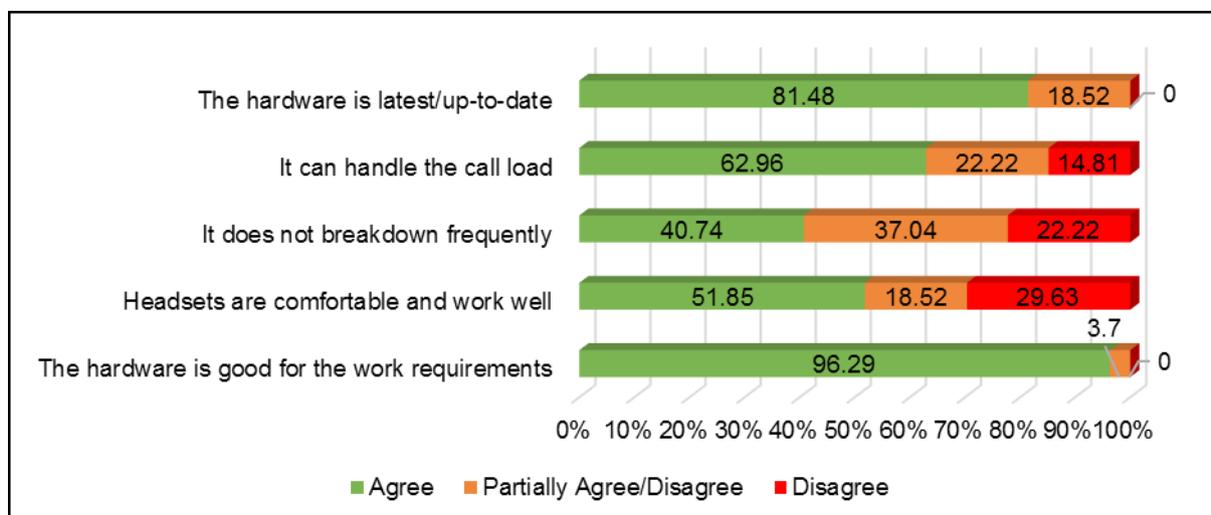
FTAs have rated the hardware they use for receiving the calls and providing answers to the farmers. By and large about 81 percent of the respondents indicate that the hardware is adequate and works well. They find the display to be good and the hardware can handle the call load that is there on a daily basis. Most of them find that the hardware is able to work even in power outages. Most of them find the interface of keyboard and the mouse to be good and the hardware to be fast and reliable. However, there is variation and a large number of them find that the hardware breaks down frequently and that the headsets are not comfortable. Overall, 96 percent of the FTAs find the hardware to be good for the work requirement. (See Table 5.1)

Table 5.1: Rating of Hardware

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average
The hardware is latest/ up-to-date	18.52	62.96	18.52	0.00	0.00	4.0
It is reliable	14.81	62.96	14.81	7.41	0.00	3.9
It is convenient to use for responding to farmer calls	29.63	59.26	11.11	0.00	0.00	4.2
It can handle the call load	11.11	51.85	22.22	14.81	0.00	3.6

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average
It does not breakdown frequently	0.00	40.74	37.04	18.52	3.70	3.2
The computer display is good	37.04	59.26	3.70	0.00	0.00	4.3
The interface of keyboard & mouse is good	14.81	51.85	25.93	7.41	0.00	3.7
Headsets are comfortable and work well	11.11	40.74	18.52	29.63	0.00	3.3
The hardware is good for the work requirements	14.81	81.48	3.70	0.00	0.00	4.1

Figure 5.1: Hardware Rating (Percent)

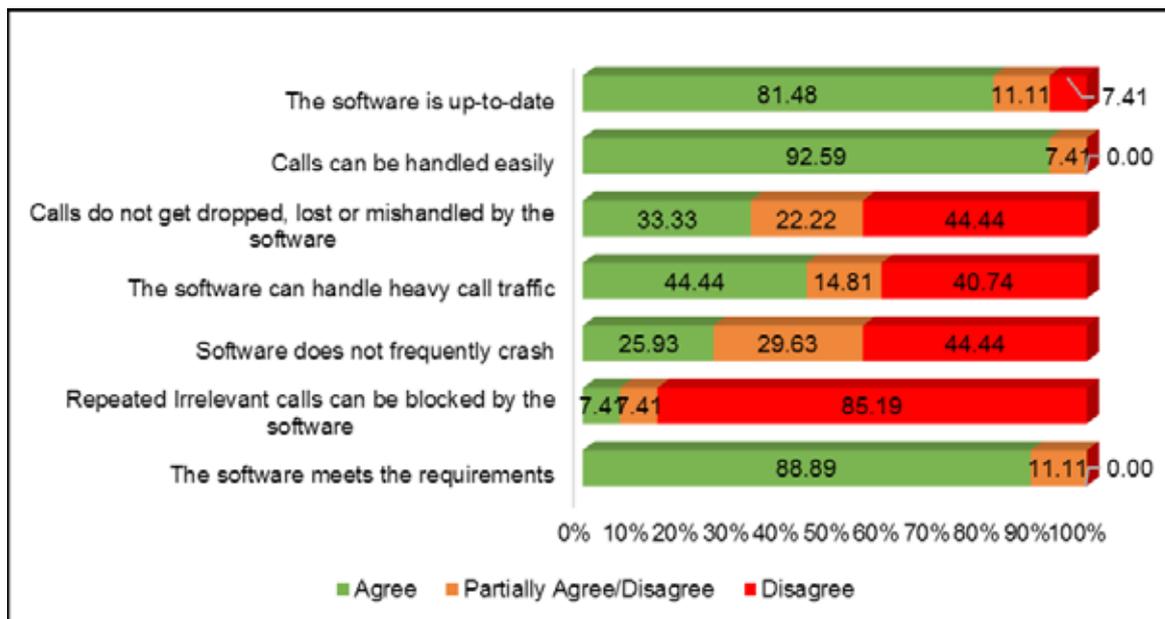


The Table 5.2 below provide the ratings for the software in the KCC used by the FTAs. About 80 to 90 percent of the FTAs feel that the software is up to date, fast and user friendly. Nearly 96 percent indicate that the screen interface is good and the calls can be handled easily. However, more than 40 percent indicate that the calls often get dropped, lost or mishandled by the software. More than 40 percent indicate the dissatisfaction in software handling the heavy call traffic. Frequency of software crashes is also seen quite frequent. The software does not help much with blocking of irrelevant calls. On the whole, whereas about 89 percent feel that the software meets the requirement.

Table 5.2: Rating of Software

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average
The software is up-to-date	14.81	66.67	11.11	7.41	0.00	3.9
It is user friendly	18.52	77.78	3.70	0.00	0.00	4.2
The screen interface it shows is good & useful	29.63	66.67	3.70	0.00	0.00	4.3
Calls can be handled easily	37.04	55.56	7.41	0.00	0.00	4.3
The voice quality is good & clear	14.81	55.56	22.22	7.41	0.00	3.8
Calls do not get dropped, lost or mishandled by the software	3.70	29.63	22.22	40.74	3.70	2.9
The software can handle heavy call traffic	7.41	37.04	14.81	37.04	3.70	3.1
Software does not frequently crash	3.70	22.22	29.63	29.63	14.81	2.7
Caller details can be easily recorded and registered	22.22	48.15	18.52	11.11	0.00	3.8
Question details can be easily & quickly recorded	22.22	37.04	29.63	11.11	0.00	3.7
Repeated Irrelevant calls can be blocked by the software		7.41	7.41	7.41	77.78	1.4
The software meets the requirements	14.81	74.07	11.11	0.00	0.00	4.0

Figure 5.2: Software Rating (Percent)

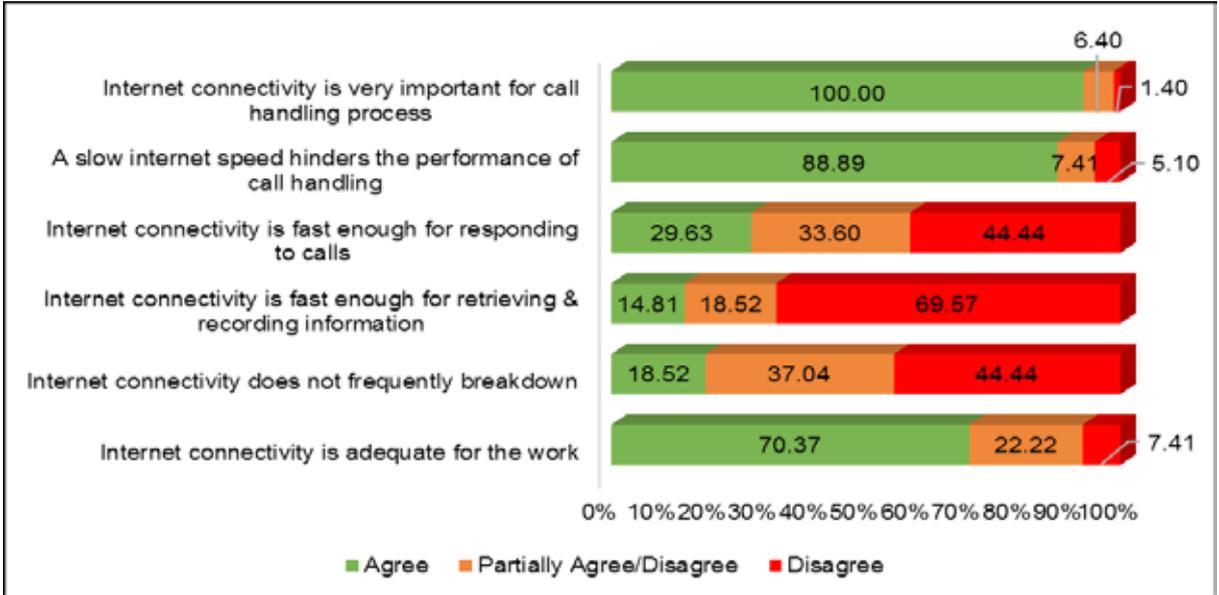


The Table 5.3 below provides response on internet connectivity. The results indicate that the internet connectivity is very important, but the connectivity is not fast enough and breaks down frequently. It is not very satisfactory and there is great need for improvement.

Table 5.3: Internet Connectivity

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
Internet connectivity is very important for call handling process	59.26	40.74	6.40	0.70	0.70	4.8
A slow internet speed hinders the performance of call handling	48.15	40.74	7.41	3.70	1.40	4.4
Internet connectivity is fast enough for responding to calls	11.11	18.52	33.60	37.04	7.41	3.1
Internet connectivity is fast enough for retrieving & recording information	0.00	14.81	18.52	66.67	2.90	2.5
Internet connectivity does not frequently breakdown	0.00	18.52	37.04	40.74	3.70	2.7
Internet connectivity is adequate for the work	7.41	62.96	22.22	7.41	0.00	3.7

Figure 5.3: Internet Connectivity

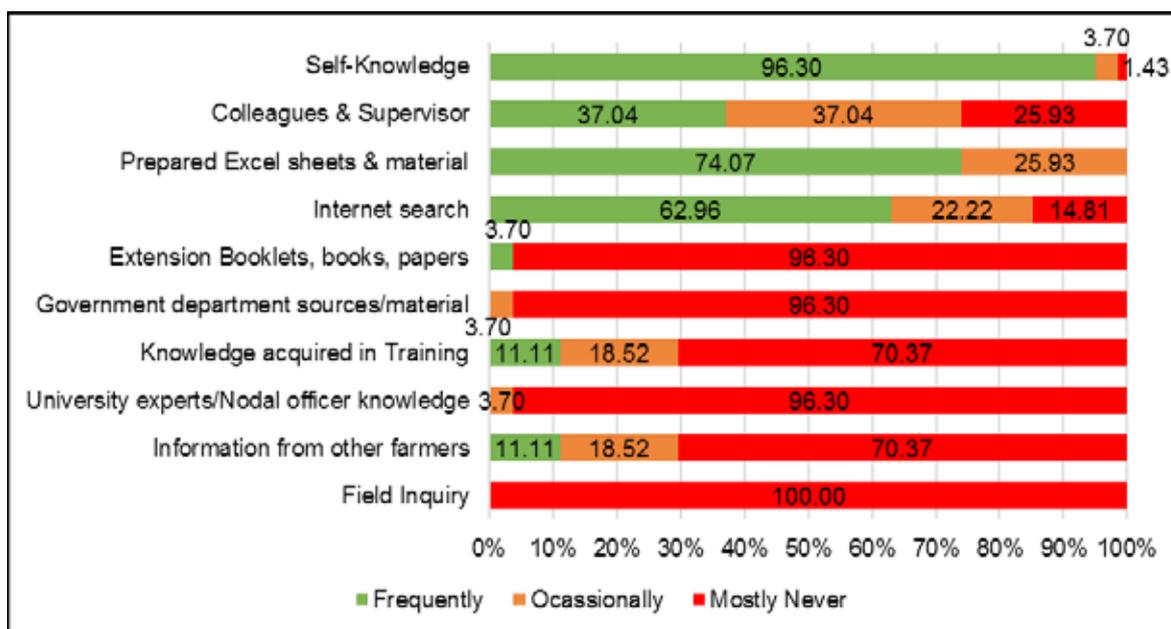


The FTAs depend on many information sources for answering questions. The Table 5.4 below gives the frequency of use of different sources of information used by the FTAs to answer farmers' questions. Clearly, the most frequently used sources is self-knowledge, which is reported to be frequently or very frequently used by over 90 percent of the FTAs. The next most frequently used source is prepared excel sheet and materials which is reported to be frequently or very frequently used by 74 percent of the FTAs. The next in frequency of use is internet search which are frequently or very frequently referred by 62 percent of the FTAs followed by colleagues and supervisors at nearly 37 percent. Extension material and knowledge acquired in training are also used but with a lesser frequency. Government department material, University experts or nodal officers are very rarely or never used. Thus, self-knowledge, self-prepared excel sheets and material and internet search are the most frequently used.

Table 5.4: Frequency of Knowledge Sources used for Answering

	Very Frequently	Frequently	Occasionally	Rarely	Never	Average Rating
Self-Knowledge	70.37	25.93	3.70		1.43	4.7
Colleagues & Supervisor	0.00	37.04	37.04	25.93	0.00	3.1
Prepared Excel sheets & material	33.33	40.74	25.93	0.00	0.00	4.1
Internet search	37.04	25.93	22.22	11.11	3.70	3.8
Extension Booklets, books, papers	0.00	3.70	0.00	33.33	62.96	1.4
Government department sources/material	0.00	0.00	3.70	11.11	85.19	1.2
Knowledge acquired in Training	7.41	3.70	18.52	51.85	18.52	2.3
University experts/Nodal officer knowledge	0.00	0.00	3.70	11.11	85.19	1.2
Information from other farmers	3.70	7.41	18.52	40.74	29.63	2.2
Field Inquiry	0.00	0.00	0.00	3.70	96.30	1.0

Figure 5.4: Frequency of Knowledge Sources used for Answering



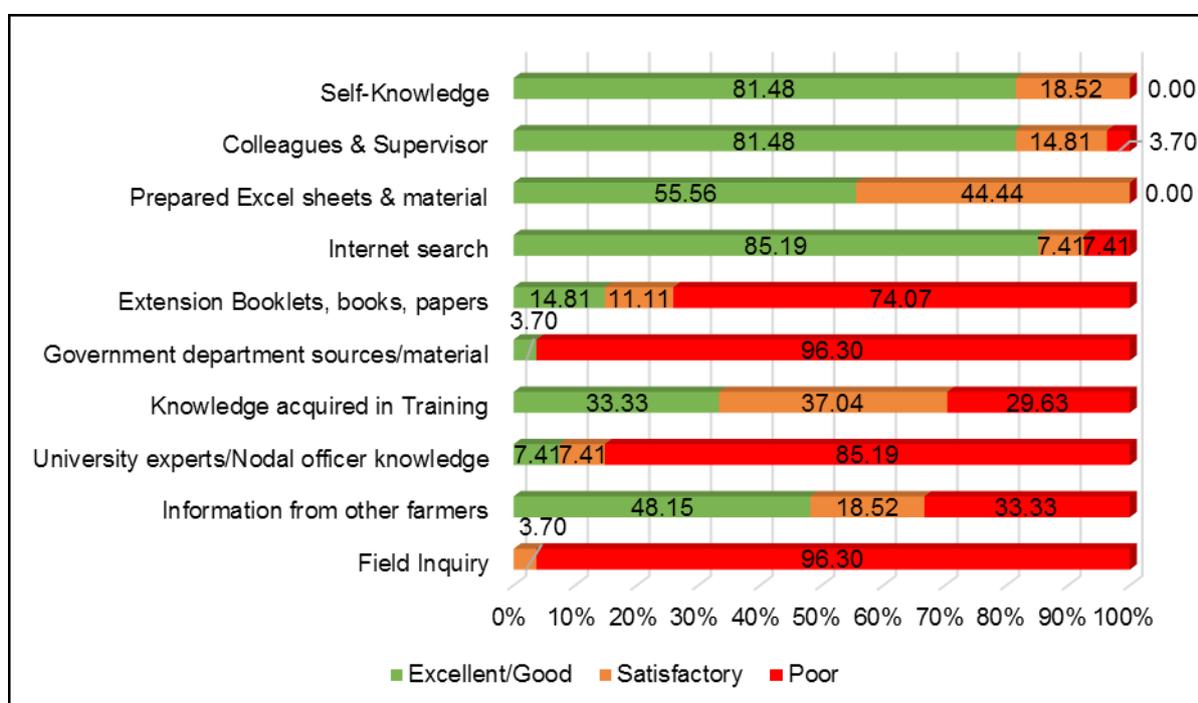
How good are the different sources of information as considered by the FTAs? Over 90 percent indicate that their self-knowledge is excellent to good, see Table 5.5 below. Over 80 percent indicate that the knowledge of their colleagues and supervisor is also good or excellent. The FTAs also depend on excel sheets and materials they have prepared to answer questions, and over 55 percent indicate that these are good to excellent. Internet search is also considered good to excellent by nearly 85 percent of the FTAs for answering questions. However, a large number of more than 74 percent indicate the inadequacy of extension booklets. 96 percent of the FTAs find Government department sources and materials to be somewhat poor to very poor. Whereas the knowledge acquired in training is reported to be satisfactory. A very large number indicate the inadequacy of university experts, and nodal officers.

Table 5.5: Rating Information & Knowledge Sources used

	Excellent	Good	Satisfactory	Somewhat Poor	Very Poor	Average Rating
Self-Knowledge	7.41	74.07	18.52	0.00	0.00	3.9
Colleagues & Supervisor	22.22	59.26	14.81	3.70		4.0
Prepared Excel sheets & material	25.93	29.63	44.44			3.8
Internet search	40.74	44.44	7.41	7.41	0.00	4.2
Extension Booklets, books, papers	0.00	14.81	11.11	11.11	62.96	1.8
Government department sources/material	3.70	0.00	0.00	14.81	81.48	1.3

	Excellent	Good	Satisfactory	Somewhat Poor	Very Poor	Average Rating
Knowledge acquired in Training	11.11	22.22	37.04	25.93	3.70	3.1
University experts/Nodal officer knowledge	3.70	3.70	7.41	11.11	74.07	1.5
Information from other farmers	3.70	44.44	18.52	3.70	29.63	2.9
Field Inquiry	0.00	0.00	3.70	3.70	92.59	1.1

Figure 5.5: Rating Information & Knowledge Sources used

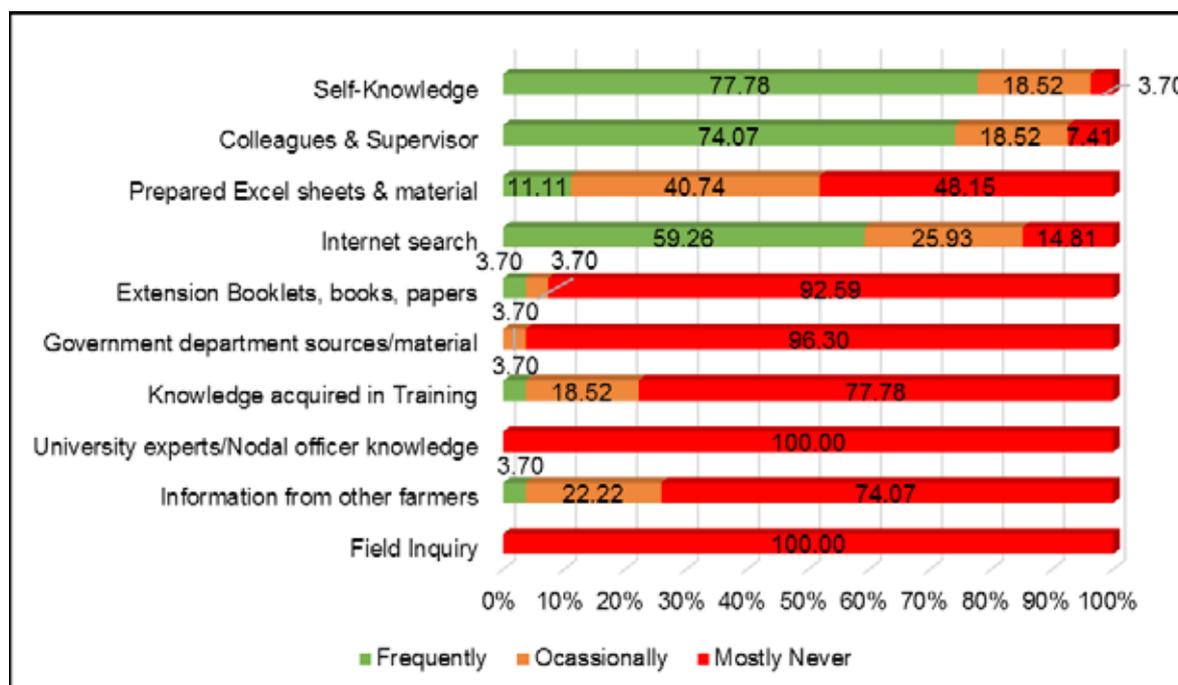


How up to date is the knowledge? The FTAs report that their self-knowledge is frequently updated and they believed that the knowledge of colleagues and supervisors is also frequently updated, see Table 5.6 below. They also consider even the internet sources to be frequently updated. However, it is reported that the extension material and government source materials are not frequently updated, and information from other sources including knowledge through training and even knowledge university experts and Nodal Officers is also not frequently updated. Thus, information from many outside and higher-level sources is reported to be frequently not up to date.

Table 5.6: Frequency of Updating the Information in the Sources

	Very Frequently	Frequently	Occasionally	Rarely	Never	Average Rating
Self-Knowledge	22.22	55.56	18.52	3.70	0.00	4.0
Colleagues & Supervisor	3.70	70.37	18.52	7.41		3.7
Prepared Excel sheets & material	0.00	11.11	40.74	37.04	11.11	2.5
Internet search	14.81	44.44	25.93	11.11	3.70	3.6
Extension Booklets, books, papers	0.00	3.70	3.70	14.81	77.78	1.3
Government department sources/material	0.00	0.00	3.70	7.41	88.89	1.2
Knowledge acquired in Training	0.00	3.70	18.52	70.37	7.41	2.2
University experts/Nodal officer knowledge	0.00	0.00	0.00	11.11	88.89	1.1
Information from other farmers	0.00	3.70	22.22	37.04	37.04	1.9
Field Inquiry	0.00	0.00	0.00	0.00	100.00	1.0

Figure 5.6: Frequency of Updating the Information in the Sources



With respect to technical information, the FTAs report that the information is easily available and that they as well as the farmers are able to easily understand and process the information, see Table 5.7 below. However, often critical information is not available

and it is often not up to date and reliable. With respect to making sufficient and quality technical information to the farmers, there is reported to be provided by a majority of the sample but there is deficiency in a large number of cases.

Table 5.7: Overall Assessment of the Information Sources used for Providing Technical Information

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
Information is easily available	14.81	77.78	7.41	0.00		4.1
Important and critical information required is easily available	7.41	33.33	22.22	37.04	0.00	3.1
The information is reliable	18.52	55.56	22.22	3.70	0.00	3.9
The information is up-to-date	11.11	37.04	18.52	33.33	0.00	3.3
Farmers can understand the information and process it easily	25.93	70.37	3.70	0.00		4.2
Farmers seem to be satisfied with the information provided	25.93	40.74	25.93	7.41	0.00	3.9
Overall there is sufficient & quality information available to answer farmer's questions	3.70	55.56	33.33	7.41	0.00	3.6

With respect to information on government schemes, it is indicated that information is frequently not available especially when it comes to critical information, see Table 5.8 below. The information is frequently not up to date and the satisfaction level with this information is very low. Thus, there is difficulty in providing satisfactory information on government schemes.

Table 5.8: Overall Assessment of the Information Sources used for Providing Government Schemes Related Information

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
Information is easily available	22.22	51.85	14.81	11.11	0.00	3.9
Important and critical information required is easily available	3.70	18.52	14.81	59.26	3.70	2.6
The information is reliable	7.41	81.48	3.70	7.41	0.00	3.9

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
The information is up-to-date	3.70	25.93	0.00	44.44	25.93	2.4
Farmers can understand the information and process it easily	7.41	81.48	7.41	3.70	0.00	3.9
Farmers seem to be satisfied with the information provided	0.00	18.52	48.15	33.33	0.00	2.9
Overall there is sufficient & quality information available to answer farmer's questions	0.00	18.52	33.33	29.63	18.52	2.5

With respect to price and market information, the FTAs report that it is easily available and easy to understand, see Table 5.9 below. However, there is often a lack of critical information lack of critical information and there are problems in terms of the information being available on time and being up to date. Overall, 48 percent say that there is lack in sufficient & quality information. There is a scope of improvement.

Table 5.9: Overall Assessment of the Information Sources used for Providing Price and Market Related Information

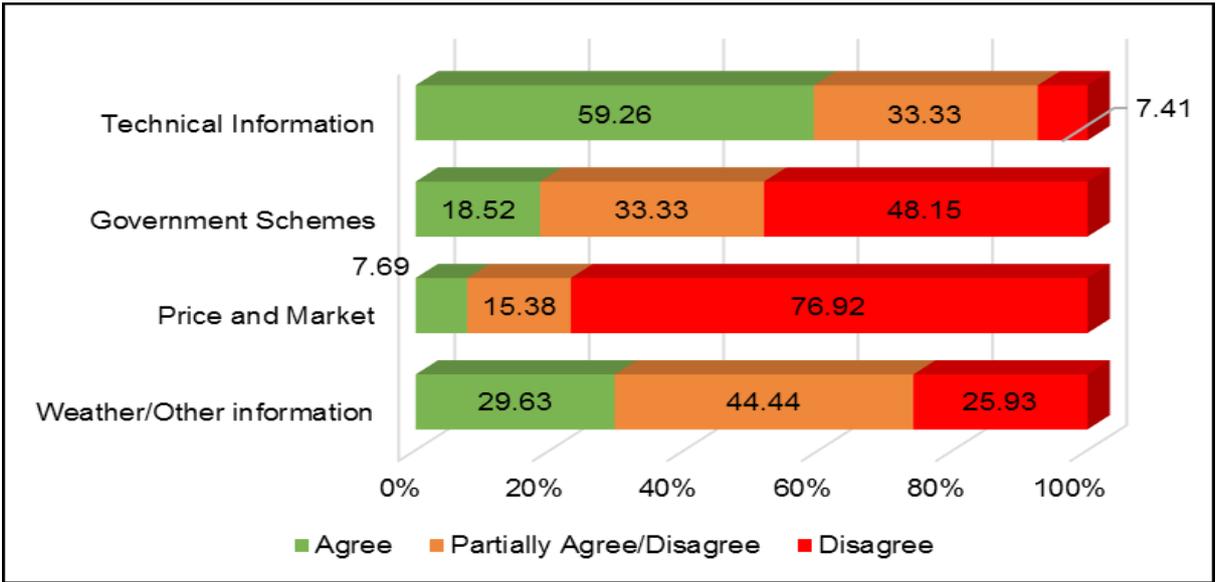
	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
Information is easily available	7.69	46.15	38.46		7.69	3.5
Important and critical information required is easily available	7.69	7.69	46.15	23.08	15.38	2.7
The information is reliable	0.00	76.92	7.69	7.69	7.69	3.5
The information is up-to-date	30.77	15.38	0.00	23.08	30.77	2.9
Farmers can understand the information and process it easily	23.08	69.23	0.00	0.00	7.69	4.0
Farmers seem to be satisfied with the information provided	0.00	30.77	38.46	23.08	7.69	2.9
Overall there is sufficient & quality information available to answer farmer's questions	0.00	7.69	15.38	61.54	15.38	2.2

With respect to other information including weather and general information, the information is easily available and is easy to understand and process, see Table 5.10 below. However, there are problems with respect to the reliability and timeliness of the information. Farmers seem to be less satisfied with the information provided and overall there is lack in sufficient and quality information.

Table 5.10 Overall Assessment of the Information Sources used for other Information used

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average Rating
Information is easily available	18.52	77.78	3.70	0.00	0.00	4.2
Important and critical information required is easily available	11.11	70.37	3.70	11.11	3.70	3.7
The information is reliable	0.00	7.41	22.22	66.67	3.70	2.3
The information is up-to-date	0.00	70.37	11.11	14.81	3.70	3.5
Farmers can understand the information and process it easily	11.11	74.07	7.41	7.41	0.00	3.9
Farmers seem to be satisfied with the information provided	0.00	14.81	25.93	55.56	3.70	2.5
Overall there is sufficient & quality information available to answer farmer's questions	3.70	25.93	44.44	25.93	0.00	3.1

Figure 5.7: Overall Information Availability to Answer Farmers Questions



The KKMS website is used almost all the time by the FTAs during their work of responding to calls and recording information. The FTAs indicate that the website is easy to use and it is clear and well organized, see Table 5.11 below. However, the response of the website is sometimes found to be slow and the information on it is often not up to date. The website also has the problem of often crashing or responding slowly during use. In terms of retrieving information and making changes in recorded information, the website has difficulties. Overall the performance of the website indicates that there is scope for improvement.

Table 5.11: Assessment of Kisan Knowledge Management System (KKMS) Website

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
KKMS website is easy to use	40.74	55.56	3.70	0.00	0.00	4.4
The organization of information on the system screens is clear	40.74	55.56	3.70	0.00	0.00	4.4
KKMS website response is fast enough	0.00	11.11	11.11	70.37	7.41	2.3
Information on the website is regularly updated	0.00	3.70	3.70	11.11	81.48	1.3
KKMS website does not fail to respond or crash during use	0.00	3.70	14.81	74.07	7.41	2.2
You can make changes in the information after the information is recorded	7.41	11.11	0.00	7.41	74.07	1.7
Retrieving information from KKMS is easy	0.00	0.00	11.11	14.81	74.07	1.4
Overall the KKMS website works well	0.00	25.93	51.85	18.52	3.70	3.0

Assessment of Farmers Portal Website

The Farmer portal website is not used by the FTAs of Gujarat Kisan Call Centre. Very few of the FTAs were aware of the website but they never used it to answer any query of farmers.

Assessment of M-Kisan Website

With respect to the M-Kisan website, there appears to be quite wide dissatisfaction and it is not very frequently used, see Table 5.12 below. The website is also not found

to be very useful and it is not very convenient to use. Overall, even though many agree that it works well, a large number are not finding it useful.

Table 5.12: Assessment of m-Kisan Website

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
The website is frequently used	0.00	0.00	0.00	33.33	66.67	1.3
The website is easy to use	0.00	66.67	0.00	0.00	33.33	3.0
The organization of information on the system screens is clear	0.00	66.67	33.33	0.00	0.00	3.7
Registration of SMS is easy	0.00	0.00	33.33	0.00	66.67	1.7
List of services available are useful	0.00	0.00	50.00	50.00	0.00	2.5
The website response is fast enough	0.00	33.33	0.00	33.33	33.33	2.3
Information on the website is regularly updated	0.00	0.00	66.67	33.33	0.00	2.7
The website does not fail to respond or crash during use	0.00	0.00	100.00	0.00	0.00	3.0
Overall the website works well	0.0	0.0	33.3	33.3	33.3	2.0

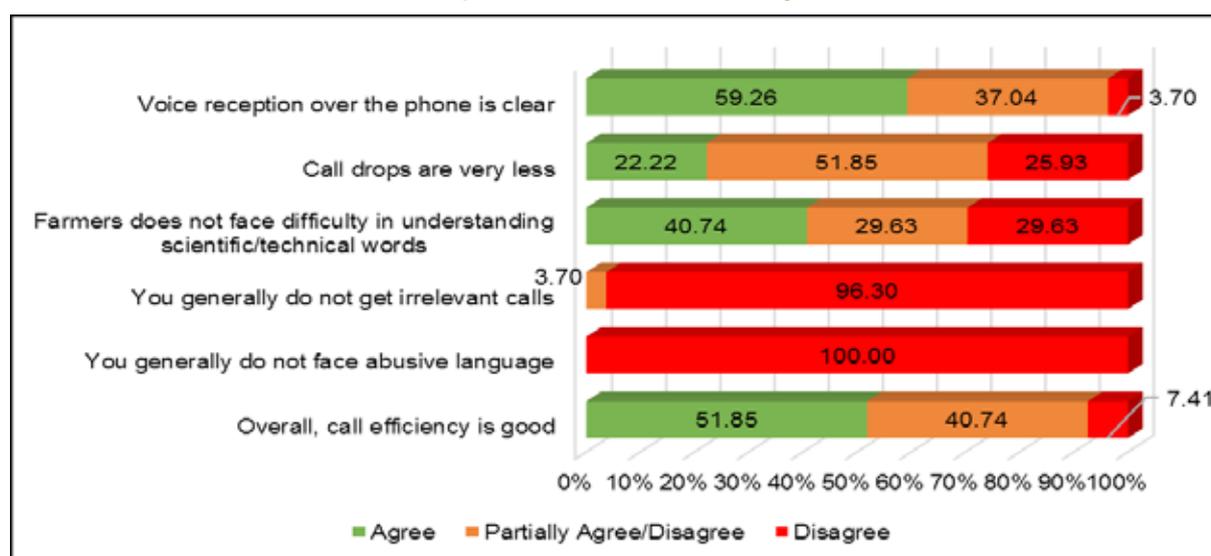
The Table 5.13 below provides as assessment of the call handling efficiency given by the FTAs. The FTAs find that the voice reception over the phone is clear. But call drops are somewhat of a problem. The FTAs indicate that they don't find much difficulty in understanding the farmers and the farmers do not face much difficulty in understanding the FTA. However, there is some difficulty in understanding scientific and technical words that are used. There exists substantial problem of irrelevant calls and all the FTAs have faced the problems in use of abusive language. However, overall, 51 per cent of the FTAs consider the call efficiency to be good.

Table 5.13: Assessing Call Efficiency

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
Voice reception over the phone is clear	11.11	48.15	37.04	3.70	0.00	3.7
Call drops are very less	0.00	22.22	51.85	25.93	0.00	3.0
It is easy to understand the queries from farmers	11.11	81.48	7.41	0.00	0.00	4.0

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
Farmers does not face difficulty in understanding your dialect	11.11	51.85	33.33	3.70	0.00	3.7
Farmers does not face difficulty in understanding scientific/technical words	0.00	40.74	29.63	18.52	11.11	3.0
You generally do not get irrelevant calls	0.00	0.00	3.70	22.22	74.07	1.3
You generally do not face abusive language	0.00	0.00	0.00	25.93	74.07	1.3
Overall, call efficiency is good	3.70	48.15	40.74	3.70	3.70	3.4

Figure 5.8: Call Efficiency

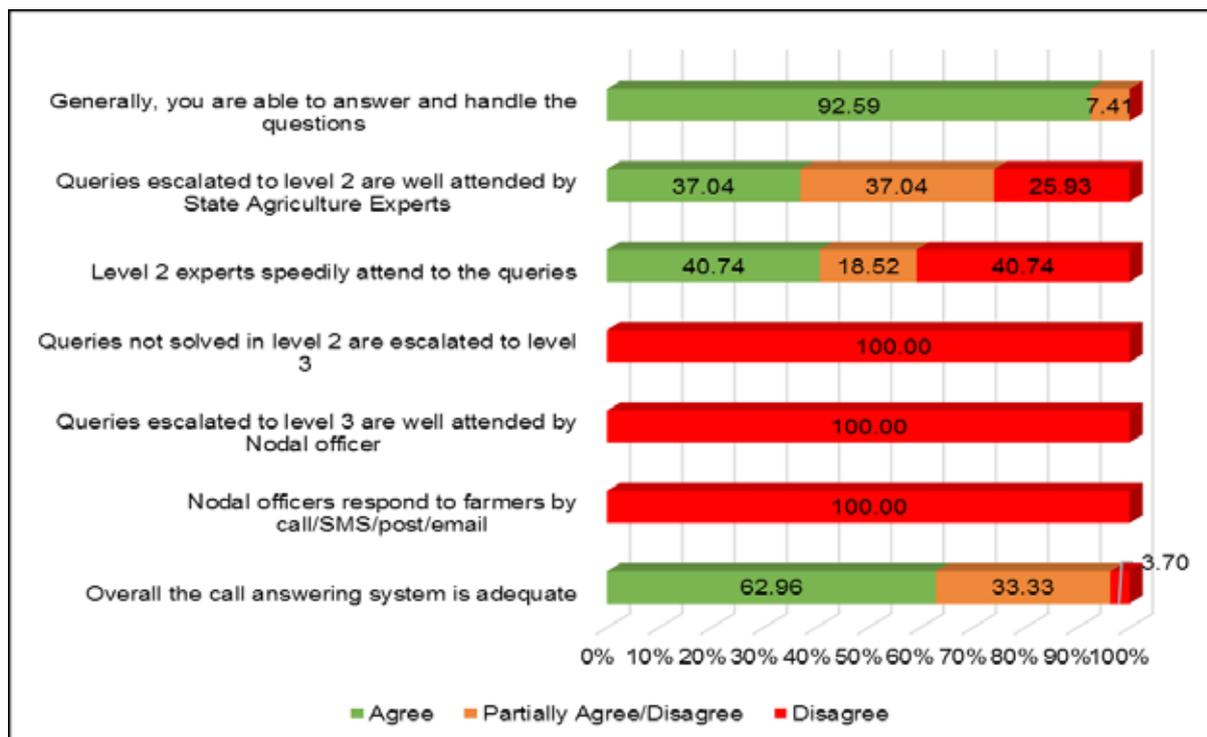


The Table 5.14 below provides an assessment of call answering systems of the KCC and its functioning. The results indicate that, to a large extent, the calls are well handled by the FTAs and they are able to answer and handle the questions themselves. Those questions which they are not able to handle appear to be answered by colleagues and supervisors substantially. The escalation to level 2 is not working very well in many cases and these calls are frequently not well attended to and not speedily attended to by the state agriculture experts. The escalation to level 3, fares even worse and the nodal officers do not often attend to the questions even through SMS or other means. Overall 60 per cent of the FTAs consider the answering systems to be adequate, and there is a substantial scope for improvement.

Table 5.14: Assessing the Call Answering Efficiency & Effectiveness

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
Generally, you are able to answer and handle the questions	22.22	70.37	7.41	0.00	0.00	4.2
Queries not solved by you are well answered by colleagues	3.70	92.59	3.70	0.00	0.00	4.0
Queries not solved by colleagues are well answered by Supervisors	7.41	92.59	0.00	0.00	0.00	4.1
Queries not solved by supervisors are easily escalated to level 2	29.63	62.96	7.41	0.00	0.00	4.2
Queries escalated to level 2 are well attended by State Agriculture Experts	7.41	29.63	37.04	25.93	0.00	3.2
Level 2 experts speedily attend to the queries	7.41	33.33	18.52	40.74	0.00	3.1
Queries not solved in level 2 are escalated to level 3	0.00	0.00	0.00	0.00	100.00	1.0
Queries escalated to level 3 are well attended by Nodal officer	0.00	0.00	0.00	100.00	0.00	2.0
Nodal officers respond to farmers by call/SMS/post/email	0.00	0.00	0.00	100.00	0.00	2.0
Overall the call answering system is adequate	3.70	59.26	33.33	3.70	0.00	3.6

Figure 5.9: Call Answering System Effectiveness



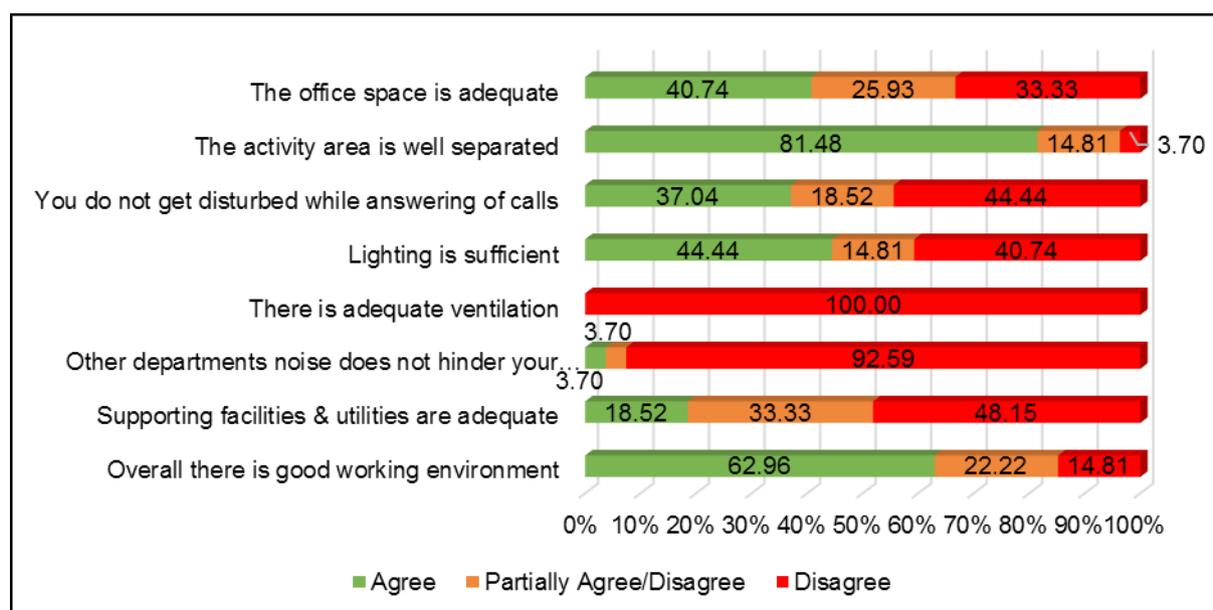
The Table 5.15 below gives the ratings of the infrastructure facility of the call centre. Overall 40 percent FTAs find the office space and the activity area are to be adequate but there still some scope for the improvement. However, the separation of the activity area between FTAs has some problems as a result of which there is disturbance while answering the calls. The lighting is sufficient but the ventilation is reported to be highly inadequate by FTAs. The video surveillance is adequate but could be better and frequent power cuts do not seem to be a common problem. The noise from other departments is reported to be a problem by about 92 per cent of the FTAs and there is a scope for improving the supportive facilities and utilities. Overall, the work environment is considered to be reasonable by about 62 per cent of the FTAs and the rest disagree and see scope for improvement.

Table 5.15 Infrastructure Rating

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average Rating
The office space is adequate	0.00	40.74	25.93	25.93	7.41	3.0
The activity area for calling is sufficient	11.11	62.96	11.11	11.11	3.70	3.7
The activity area is well separated	7.41	74.07	14.81	3.70	0.00	3.9
You do not get disturbed while answering of calls	0.00	37.04	18.52	37.04	7.41	2.9

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average Rating
Lighting is sufficient	11.11	33.33	14.81	40.74	0.00	3.2
There is adequate ventilation	0.00	0.00	0.00	62.96	37.04	1.6
Video surveillance is sufficient for monitoring	3.70	48.15	25.93	18.52	3.70	3.3
Power cuts are not frequent	14.81	77.78	3.70	3.70	0.00	4.0
Other departments noise does not hinder your answering efficiency	0.00	3.70	3.70	51.85	40.74	1.7
Supporting facilities & utilities are adequate	0.00	18.52	33.33	44.44	3.70	2.7
Overall there is good working environment	0.00	62.96	22.22	14.81	0.00	3.5

Figure 5.10: Office & Infrastructure

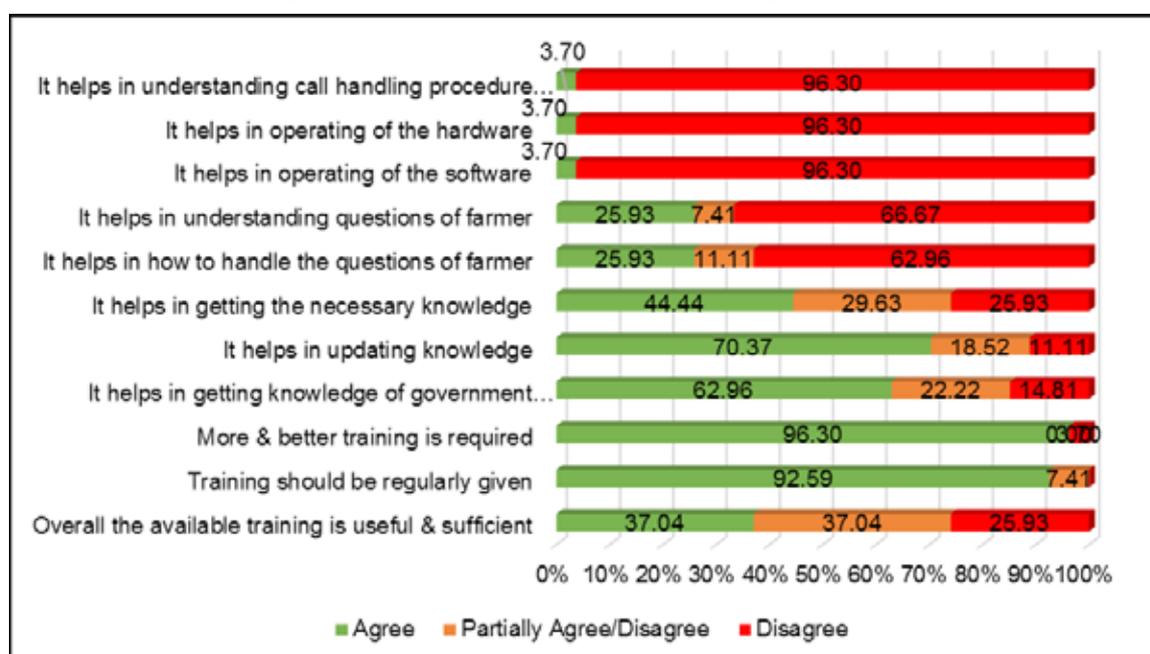


The Table 5.16 below provides as assessment of the training programmes that are conducted for the FTAs. According to the responses, the few benefits of the programme appeared to be understanding farmers questions and how to handle them as well as obtaining the necessary and up to date knowledge required. However, the training does not appear to be adequately cover the operation of the hardware and the software. Overall 92 percent of the FTAs indicate the substantial need for better and regular training. Overall only about 37 per cent of the FTAs are satisfied with the training programmes.

Table 5.16: Overall Assessment of Usefulness of Training Programmes

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average Rating
It helps in understanding call handling procedure of the KCC	0.00	3.70	0.00	0.00	96.30	1.1
It helps in operating of the hardware	0.00	3.70	0.00	0.00	96.30	1.1
It helps in operating of the software	0.00	3.70	0.00	0.00	96.30	1.1
It helps in understanding questions of farmer	0.00	25.93	7.41	7.41	59.26	2.0
It helps in how to handle the questions of farmer	0.00	25.93	11.11	11.11	51.85	2.1
It helps in getting the necessary knowledge	0.00	44.44	29.63	18.52	7.41	3.1
It helps in updating knowledge	0.00	70.37	18.52	11.11	0.00	3.6
It helps in getting knowledge of government schemes	11.11	51.85	22.22	14.81	0.00	3.6
More & better training is required	33.33	62.96	0.00	3.70	0.00	4.3
Training should be regularly given	25.93	66.67	7.41	0.00	0.00	4.2
Overall the available training is useful & sufficient	0.00	37.04	37.04	22.22	3.70	3.1

Figure 5.11: Assessment of Training Programmes



The Table 5.17 below provides the results of self-assessment reported by the FTAs. By and large the results indicate that the FTAs considers themselves to be capable of managing the calls well and provide good answers to the farmers either themselves or taking the help of colleagues. But the escalation of calls does not seem to be working well. The FTAs considered themselves to be well motivated and showing good discipline, and take in taking initiative to improve, innovate and perform better. They indicate that they are well trained and overall, they seem to be happy with their performance.

Table 5.17: Self-Assessment of the FTA

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
You are quick in responding to calls	48.15	51.85	0.00	0.00	0.00	4.5
You are able to manage the calls efficiently.	33.33	62.96	3.70	0.00	0.00	4.3
You have sufficient knowledge & capability to answer questions	3.70	48.15	37.04	11.11	0.00	3.4
You are generally able to answer the questions by yourself	18.52	70.37	11.11	0.00	0.00	4.1
You are able to quickly access the database/information to answer questions	25.93	70.37	3.70	0.00	0.00	4.2
You can take the help of colleagues to answer questions	7.41	88.89	3.70	0.00	0.00	4.0
You can escalate calls to higher levels to answer questions	11.11	85.19	3.70	0.00	0.00	4.1
You are able to satisfactorily find answers for the farmer's questions	22.22	55.56	22.22	0.00	0.00	4.0
You show good discipline, attendance & punctuality	29.63	62.96	7.41	0.00	0.00	4.2
You are well motivated	33.33	48.15	18.52	0.00	0.00	4.2
You take good initiative to improve, innovate and perform better	11.11	40.74	40.74	7.41	0.00	3.6
You are well trained	0.00	55.56	40.74	3.70	0.00	3.5
Overall you are satisfied with your performance	11.11	70.37	14.81	0.00	3.70	3.9

The Table 5.18 below provides a brief overall assessment of the call handling effectiveness as reported by the FTAs. It shows that a large number of calls are received by the KCC every day and the FTAs are able to handle them efficiently. The call handling systems and procedures are considered to be good and they feel that they are able to understand the farmers and communicate with them well. Overall the FTAs think that the farmers are satisfied with the handling and the speed of response from the KCC.

Table 5.18: Overall Assessment of Call Handling

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
A large number of calls are received every day at the KCC	7.41	33.33	22.22	37.04	0.00	3.1
All calls can be handled efficiently at the KCC	14.81	51.85	3.70	29.63	0.00	3.5
Call handling systems/ procedures are good	7.41	77.78	7.41	7.41	0.00	3.9
The farmer & FTA can understand each other & communicate easily	11.11	77.78	7.41	3.70	0.00	4.0
Overall the farmers seem satisfied with the handling & speed of response	0.00	74.07	14.81	11.11	0.00	3.6

The Table 5.19 below provides the overall assessment of the FTAs for the hardware, software and infrastructure of the KCC. The performance of the hardware and software is not generally considered excellent but is considered to be good or better by 70 to 74 percent of the FTAs. However, over 59 percent of the FTAs are not happy with the internet connectivity. Also, over 65 percent of the FTAs are not happy with the infrastructure and service support that is provided. Thus, there is scope for improvement in these.

Table 5.19: Overall Assessment of Hardware, Software & Infrastructure

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
The performance of the hardware used is good & it is helpful	3.70	74.07	14.81	7.41	0.00	3.7
The performance of the software used is good & it is helpful	3.70	70.37	22.22	3.70	0.00	3.7

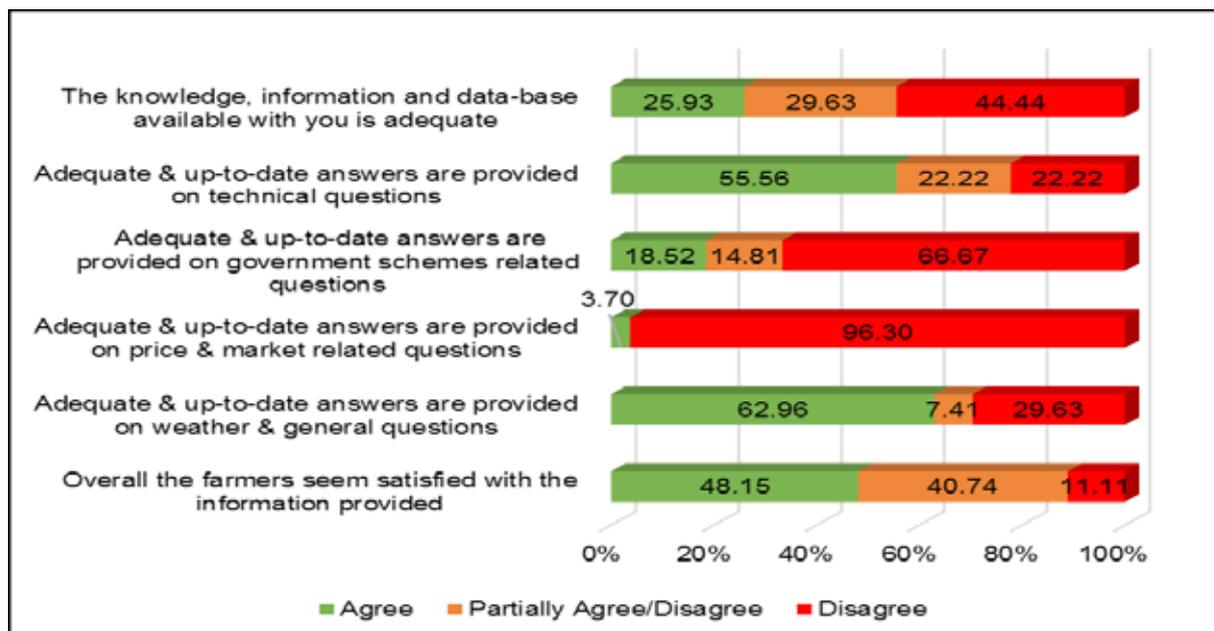
	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
The performance of the internet connectivity is good	0.00	25.93	14.81	59.26	0.00	2.7
The infrastructure & service support is good	0.00	25.93	18.52	55.56	0.00	2.7

The Table 5.20 below provides an assessment of the knowledge and information delivered by the KCC to the farmers. Only 55 percent of the FTAs think that the knowledge and information available at the KCC is adequate but the rest 45 percent scope for improvement. In terms of technical questions, 55 percent think that adequate and up to date answers are provided. However, this is not the case with respect to government schemes and market related information, where a large number consider the information provided as inadequate. In the matter of weather and general information, a large majority consider the information provided to be adequate. Overall, over 48 percent of the FTAs consider the information provided to the farmers as satisfactory.

Table 5.20: Overall Assessment of Information Provided

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average Rating
The knowledge, information and data-base available with you is adequate	3.70	22.22	29.63	44.44	0.00	2.9
Adequate & up-to-date answers are provided on technical questions	3.70	51.85	22.22	22.22	0.00	3.4
Adequate & up-to-date answers are provided on government schemes related questions	0.00	18.52	14.81	66.67	0.00	2.5
Adequate & up-to-date answers are provided on price & market related questions	0.00	3.70	0.00	74.07	22.22	1.9
Adequate & up-to-date answers are provided on weather & general questions	7.41	55.56	7.41	29.63	0.00	3.4
Overall the farmers seem satisfied with the information provided	0.00	48.15	40.74	11.11	0.00	3.4

Figure 5.12: Assessment of Information Provided



The Table 5.21 below provides responses of the FTAs on the overall performance of KCC. It indicates that nearly 62 percent consider the KCC performance to be good to excellent but over 33 percent see scope for improvement. In terms of their own contribution at the KCC, over 70 percent considered to be good to excellent. Regarding the systems and policies under which the KCC is working, there is considerable dissatisfaction with nearly 37 percent considering the situation to be in the range of poor to satisfactory. Regarding the usefulness of the KCC to the farmers and the state agriculture, over 74 per cent consider this to be good to excellent. All the FTAs are of the opinion that the Kisan Call Centre scheme should be continued (Fig 5.12).

Table 5.21: Overall Assessment of Kisan Call Centre

	Excellent	Good	Satisfactory	Somewhat Poor	Very Poor	Average Rating
Please give your overall assessment of the performance of the Kisan Call Centre	14.81	48.15	33.33	3.70		3.8
Please give an overall assessment of your own performance/contribution at the Kisan Call Centre	18.52	51.85	29.63			4
Please give your overall assessment of the systems & policies under which the Kisan Call Centre is working	3.70	11.11	48.15	29.63	7.41	2.9

	Excellent	Good	Satisfactory	Somewhat Poor	Very Poor	Average Rating
Please give your overall assessment about the usefulness of the Kisan Call Centre to the farmers & the state's agriculture	18.52	55.56	22.22	3.70		4.1

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average Rating
Please give your overall opinion whether the Kisan Call Centre Scheme should be continued	66.2	30.9	2.9			4.6

Figure 5.13: Overall Assessment of KCC

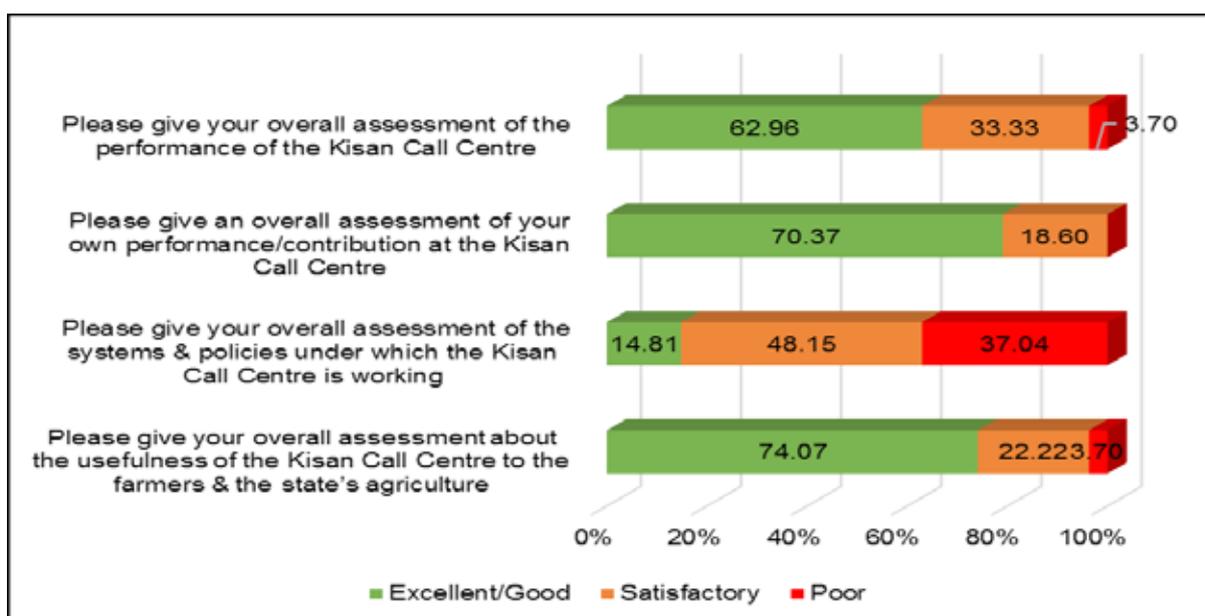
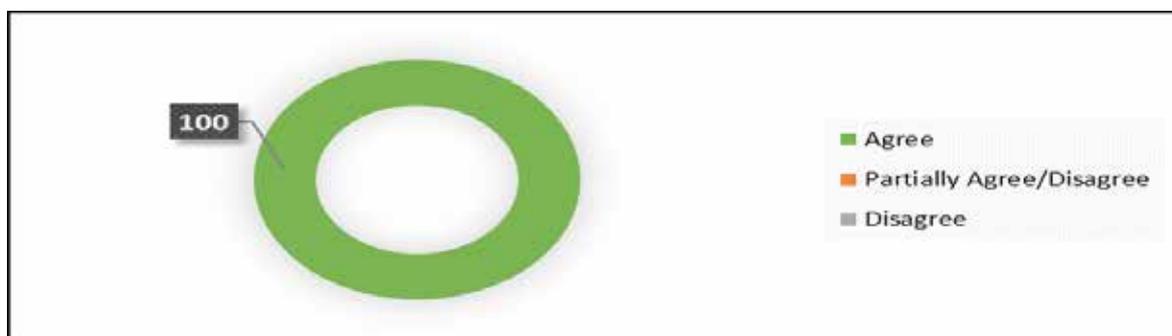


Figure 5.14: Overall Opinion whether the Kisan Call Centre Scheme should be Continued



Chapter 6

Results: Farmers' Survey

As described above, 128 farmer KCC users were covered in the study survey. This includes 98 farmer KCC users and 22 non users from Gujarat. The analysis below is confined to the user farmer data (unless specifically mentioned), given that only they could respond to all the questions.

The Table 6.1 below provides an analysis of the sources of information and advice on farming used by the KCC user farmers. It shows that the farmers are aware of a large number of sources of information and since this sample covers only the users of KCC, all of them are aware of and use of the Kisan Call Centres.

In terms of use, after the Kisan Call Centre (100), the next most important source used by the farmers is fellow farmer (90.82), which is followed by input dealers (90.22), and Agricultural Universities & their materials (88.37). The next in use comes input companies and krishi melas/summit at (78.26) each and other call centre (79.17). In terms of frequency of use of the different sources, extension workers are found to be frequently or very frequently used by 80 percent of the farmer followed by fellow farmers which stands at 75.28 percent of the farmers and Kisan Call Centre at 60.20 percent. After a large margin follow input dealers and shop which stand at 49.40 percent and meetings & demonstrations at 45.45 percent. Thus, KCCs have done well but are not the most used source of information by the user farmers. This shows that Kisan Call Centres still have scope for improvement.

In the survey it was observed that farmers prefer to use that information source which they find the most reliable and trustworthy, and from where the information

most relevant and easily available. In Gujarat, due to the strong presence of extension workers in the rural areas, farmers frequently used extension services. If nearby, institutions such as State Agriculture Universities also played an important role, and some farmers often visit these state Agriculture Universities for getting information on latest practices.

In terms of the media or devices used for gathering information the most frequently mentioned is mobile phones (86.81) followed by radio (71.43) and mobile apps (66.67). The above results indicate that mobile phones have become the most frequently used device for communication/ sourcing of information, followed by radio. (See Table 6.2)

Table 6.1: Sources of Information/ Advice on Farming – Awareness, Use and Frequency of Use

	Aware (%)	Use (%)	Very Frequently	Frequently	Occasionally	Rarely	Never	Average
Kisan Call Centre (KCC)	100.00	100.00	5.10	55.10	35.71	4.08	0.00	3.6
Fellow Farmers	93.88	90.82	8.99	66.29	20.22	4.49	0.00	3.8
Extension Worker	21.43	71.43	26.67	53.33	20.00	0.00	0.00	4.1
Input Dealers/ Shops	95.88	90.22	1.20	48.19	40.96	9.64	0.00	3.4
Cooperative societies	61.19	36.96	5.88	35.29	29.41	29.41	0.00	3.2
Input Companies	85.88	78.26	2.78	36.11	22.22	38.89	0.00	3.0
Local Markets	74.63	76.47	11.54	23.08	46.15	19.23	0.00	3.3
Krishi Vigyan Kendra's (KVK's)	78.57	67.65	4.17	25.00	29.17	41.67	0.00	2.9
Agricultural Universities & their materials	79.52	88.37	2.63	28.95	36.84	31.58	0.00	3.0
Kisan melas/ summits	91.86	78.26	2.78	16.67	38.89	41.67	0.00	2.8
Meetings & demonstrations	66.67	75.00	18.18	27.27	54.55	0.00	0.00	3.6
Agriculture experts	47.06	64.29	0.00	22.22	33.33	44.44	0.00	2.8
Other Call Centres (Specify)	51.11	79.17	0.00	38.10	42.86	19.05	0.00	3.2

Figure 6.1: Sources of Information Used-Frequency

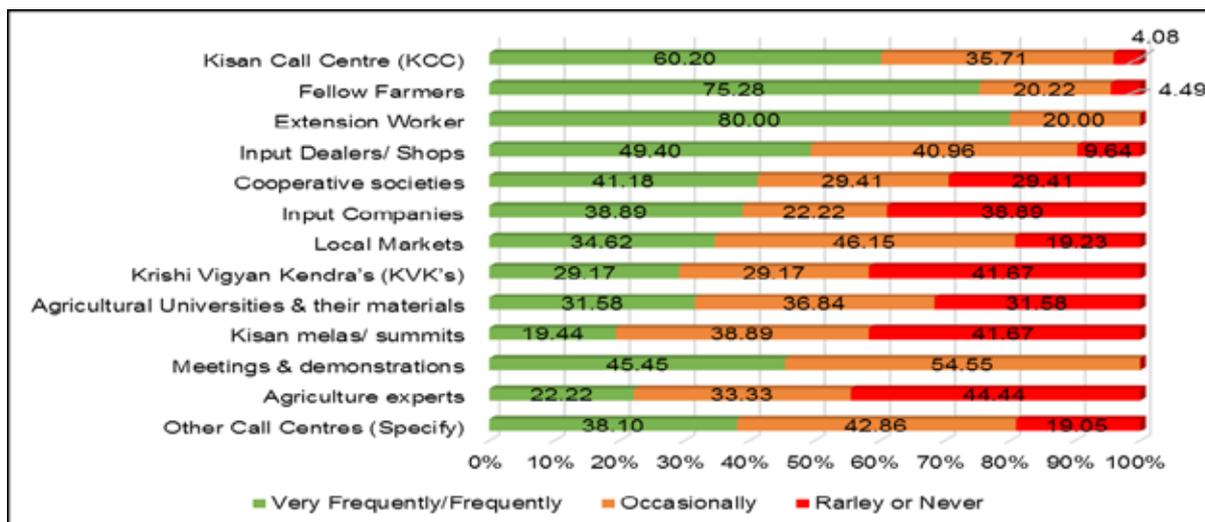
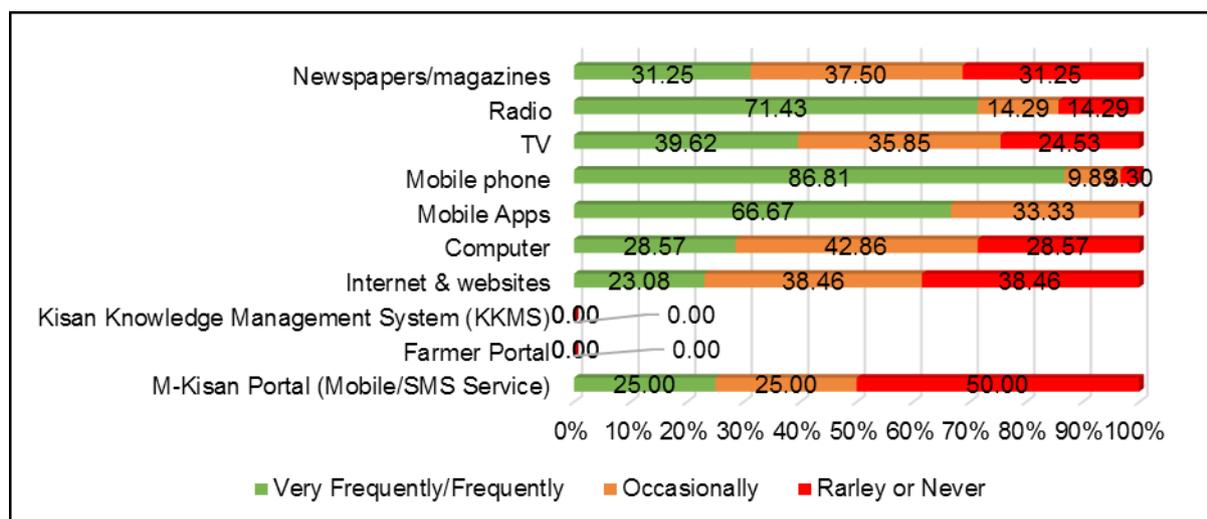


Table 6.2: Communication Media and Devices Used to Source Information Awareness and Use Frequency

	Aware (Valid %)	Use (Valid %)	Very Frequently	Frequently	Occasionally	Rarely	Never	Average
Newspapers/ magazines	82.14	88.68	4.17	27.08	37.50	31.25	0.00	3.0
Radio	62.50	11.11	42.86	28.57	14.29	14.29	0.00	4.0
TV	89.66	60.92	11.32	28.30	35.85	24.53	0.00	3.3
Mobile phone	100.00	98.91	25.27	61.54	9.89	3.30	0.00	4.1
Mobile Apps	41.84	15.31	20.00	46.67	33.33	0.00	0.00	3.9
Computer	52.04	7.14		28.57	42.86	28.57	0.00	3.0
Internet & websites	51.02	13.27	7.69	15.38	38.46	38.46	0.00	2.9
Kisan Knowledge Management System (KKMS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Farmer Portal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
M-Kisan Portal (Mobile/SMS Service)	17.35	8.16	0.00	25.00	25.00	37.50	12.50	2.6

Figure 6.2: Media/ Device used



The Table 6.3 below provides an analysis of the quality or usefulness of information available from different sources. Here the highest score is obtained by extension workers (4.13) followed by cooperative societies (4.12), fellow farmers (3.80), input companies (3.69), KVK (3.63) and Kisan Call Centres (3.54). 86.67 percent of the users rate extension workers as good to excellent source of information, followed by 76.47 percent for cooperative societies, with Kisan Call Centres at 59.18 percent. This indicates that even though the Kisan Call Centres have done well, there is considerable scope of improvement. Examining media and other devices used to communicate the highest rate is obtained by TV (3.95) followed by mobile phones and apps (3.65/3.67) and then internet (3.46). Thus, TV is rated the highest but mobile phones and internet have come to be rated very highly as information sources. (See Table 6.4)

Table 6.3: Sources of Information/ Advice on Farming - Awareness/ Usefulness and Quality

	Aware (Valid %)	Use (Valid %)	Excellent	Good	Satisfactory	Somewhat poor	Very Poor	Average
Kisan Call Centre (KCC)	100.00	100.00	4.08	55.10	32.65	7.14	1.02	3.5
Fellow Farmers	93.88	90.82	8.99	64.04	24.72	2.25		3.8
Extension Worker	21.43	71.43	33.33	53.33	6.67	6.67		4.1
Input Dealers/ Shops	95.88	90.22	3.66	52.44	34.15	8.54	1.22	3.5
Cooperative societies	61.19	36.96	41.18	35.29	17.65	5.88		4.1
Input Companies	85.88	78.26	11.43	51.43	31.43	5.71		3.7

	Aware (Valid %)	Use (Valid %)	Excellent	Good	Satisfactory	Somewhat poor	Very Poor	Average
Local Markets	74.63	76.47		38.46	42.31	15.38	3.85	3.2
Krishi Vigyan Kendra's (KVK's)	78.57	67.65	12.50	45.83	33.33	8.33		3.6
Agricultural Universities & their materials	79.52	88.37	10.53	44.74	28.95	13.16	2.63	3.5
Kisan melas/ summits	91.86	78.26	5.56	33.33	41.67	13.89	5.56	3.2
Meetings & demonstrations	66.67	75.00		45.45	27.27	18.18	9.09	3.1
Agriculture experts	47.06	64.29	11.11	44.44	22.22	22.22		3.4
Other Call Centres (Specify)	51.11	79.17	4.76	47.62	33.33	9.52	4.76	3.4

Figure 6.3: Sources of Information – Quality Rating

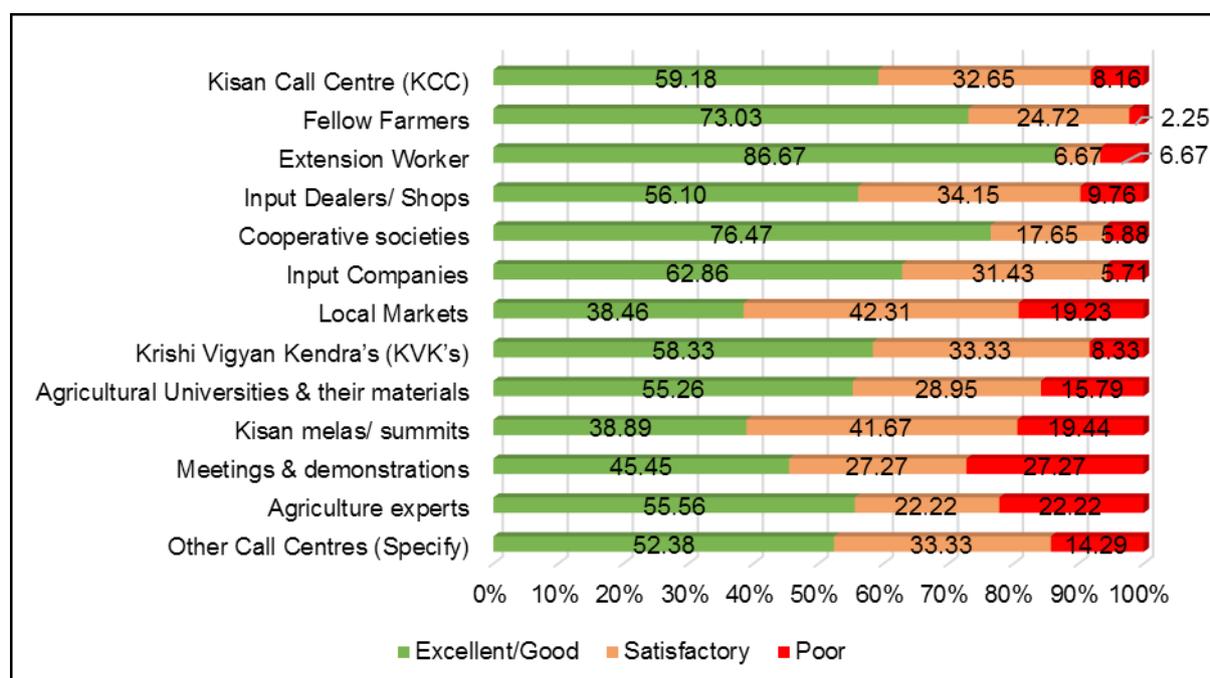
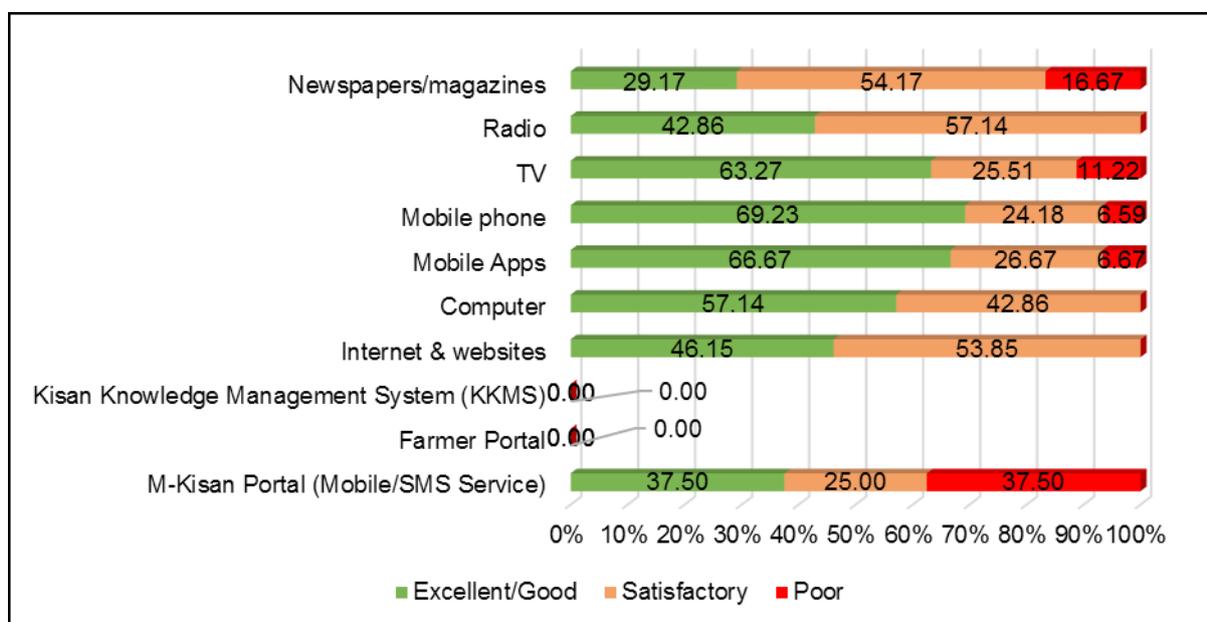


Table 6.4: Communication Media and Devices used to Source Information – Awareness/ Use and Quality

	Aware (Valid %)	Use (Valid %)	Excellent	Good	Satisfactory	Somewhat poor	Very Poor	Average
Newspapers/ magazines	82.14	88.68		29.17	54.17	12.50	4.17	3.1
Radio	62.50	11.11		42.86	57.14			3.4
TV	89.66	60.92	45.92	17.35	25.51	8.16	3.06	4.0

	Aware (Valid %)	Use (Valid %)	Excellent	Good	Satisfactory	Somewhat poor	Very Poor	Average
Mobile phone	100.00	98.91	2.20	67.03	24.18	6.59		3.7
Mobile Apps	41.84	15.31	6.67	60.00	26.67	6.67		3.7
Computer	52.04	7.14		57.14	42.86			3.6
Internet & websites	51.02	13.27		46.15	53.85			3.5
Kisan Knowledge Management System (KKMS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Farmer Portal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
M-Kisan Portal (Mobile/SMS Service)	17.35	8.16		37.50	25.00	12.50	25.00	2.8

Figure 6.4: Media/ Device used Quality Rating



Examining ICTs devices used by the farmers to obtain information, the Table 6.5 below indicates that mobile phones are owned by all users and are used by them for reaching the KCC. Mobile internet connection is owned by only 18.4 percent of the users and used by 19.86 percent of them. This seems to indicate that ordinary mobile are the ones that are most commonly owns and used. Broadband/Wi-Fi is owned by 4.1 percent of the farmers and used by 100 percent of them. Computers are owned by 5.1 percent of the farmers and but indicated used by 100 percent of them. In terms of satisfaction, Broadband/Wi-Fi scored the highest with an average of 4.75 followed by mobile at 3.82 and computer at 3.67.

Table 6.5: Type of ICT Devices/ Features Used and their Usefulness – Percent

	Owned	Used	Used for KCC/ Websites/ Portals	Excellent	Good	Satisfactory	Somewhat Poor	Very Poor	Average
Mobile	100.0	100.0	100.0	7.1	69.4	21.4	2.0	0.00	3.8
Landline	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
STD/PCO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Mobile Internet Connection	18.4	19.4	8.2	0.00	75	25	0	0.00	3.2
Broadband/ Wi-Fi	4.1	100.0	100.0	75.0	25.0	0.00	0.00	0.00	4.8
Computer	5.1	100.0	100.0	16.7	33.3	50.0	0.00	0.00	3.7

The Table 6.6 below provide an analysis of the number of calls made by the farmer users to the different KCCs. The Table shows that on an average a user made 30 calls per year to the Kisan Call Centres. The data indicates that the average waiting time is 2.2 minutes per call. The average number of calls not answered was 3 and the calls dropped was 2. In terms of percentage on the whole, the percentage of calls not answered was 10.2, calls dropped was 5.8 percent and calls were no proper answer was given was 13.5 percent. On the whole, the users reported that the calls that were effectively answered were only 45.7 percent. The data shows that the maximum numbers of calls were regarding technical information and these constituted 33.1 percent of the calls. This was followed by calls regarding weather at 31.4 percent. Overall, the data indicates that the call efficiency is not satisfactory with only 45.7 percent of the calls being seen as effectively answered - there is scope of improvement.

Table 6.6: Average No. of Calls Per User Per Year

	Gujarat
No. of calls made	30
Average waiting time (minutes per call)	2.2 Minutes
No. of calls not answered	3
No. of calls dropped	2
No. of calls in which no proper answers were given	4
No. of calls effectively answered	14
No. of calls for technical information	10
No. of calls for price and market information	3
No. of calls for government scheme information	4
No. of calls for other information - weather	9
No. of calls for other information	0
Sample no. of Farmers	98

Table 6.6.1: Average No. of Calls Per User Per Year – Percentage

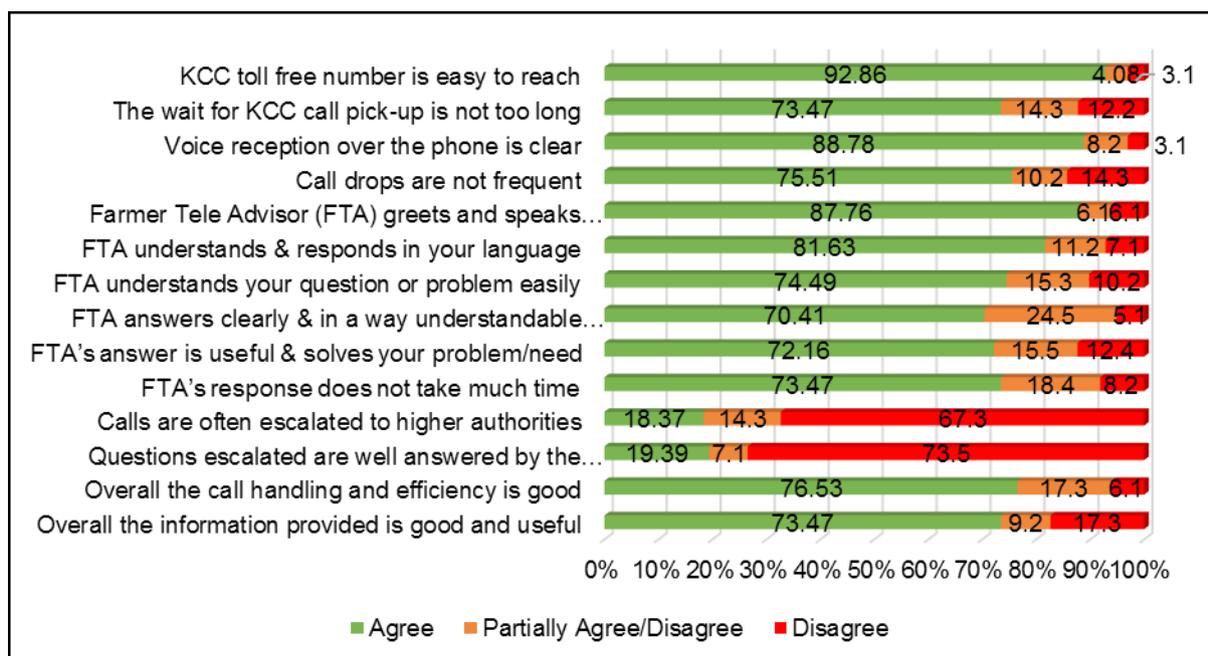
	Gujarat
No. of calls made - percent	100%
Average waiting time (minutes per call)	2.2 Minutes
No. of calls not answered	10.2
No. of calls dropped	5.8
No. of calls in which no proper answers were given	13.5
No. of calls effectively answered	45.7
No. of calls for technical information	33.1
No. of calls for price and market information	10.3
No. of calls for government scheme information	12.9
No. of calls for other information -weather	31.4
No. of calls for other information (specify)	0.7
Sample no. of farmers	98

The Table 6.7 below provides an analysis of the call response efficiency and quality of the KCC as reported by the farmers. 92 percent of the users indicate that the KCC toll free number is easy to reach and 73 percent report that the wait for KCC to pick up is not too long. More than 88 percent of the users indicate that the voice reception over the phone is clear and over 75 percent report that the call drops are not frequent. Nearly 87 percent indicate that the FTAs greets and speaks courteously and understands and responds in the local language. Over 81 percent report that the FTA understands the question or problem easily and provides answers in a clear and understandable way. The usefulness of the answer in solving the problem is at 72 percent. Regarding the escalation of the call to higher authorities, experts or nodal officer, the responses indicate that this is not satisfactory. However, overall, in terms of the call handling efficiency, over 76 percent agree and in terms of information provided 73 percent agree to be good and useful.

Table 6.7: Overall Call Response Efficiency & Quality

	Strongly Agree	Agree	Partially Agree/ Disagree	Disagree	Strongly Disagree	Average
KCC toll free number is easy to reach	41.84	51.02	4.08	3.06	0.00	4.3
The wait for KCC call pick-up is not too long	3.1	70.4	14.3	11.2	1.0	3.6
Voice reception over the phone is clear	30.6	58.2	8.2	3.1	0.00	4.2
Call drops are not frequent	23.5	52.0	10.2	10.2	4.1	3.8
Farmer Tele Advisor (FTA) greets and speaks courteously	33.7	54.1	6.1	4.1	2.0	4.1
FTA understands & responds in your language	24.5	57.1	11.2	7.1	0.00	4.0
FTA understands your question or problem easily	14.3	60.2	15.3	8.2	2.0	3.8
FTA answers clearly & in a way understandable to you	17.3	53.1	24.5	3.1	2.0	3.8
FTA's answer is useful & solves your problem/need	13.4	58.8	15.5	10.3	2.1	3.7
FTA's response does not take much time	7.1	66.3	18.4	7.1	1.0	3.7
Calls are often escalated to higher authorities	0.00	18.4	14.3	9.2	58.2	1.9
Questions escalated are well answered by the Agriculture Experts or Nodal Officer	7.1	12.2	7.1	0.00	73.5	1.8
Overall the call handling and efficiency is good	5.1	71.4	17.3	5.1	1.0	3.7
Overall the information provided is good and useful	17.3	56.1	9.2	13.3	4.1	3.7

Figure 6.5: Overall Call Response Efficiency & Quality

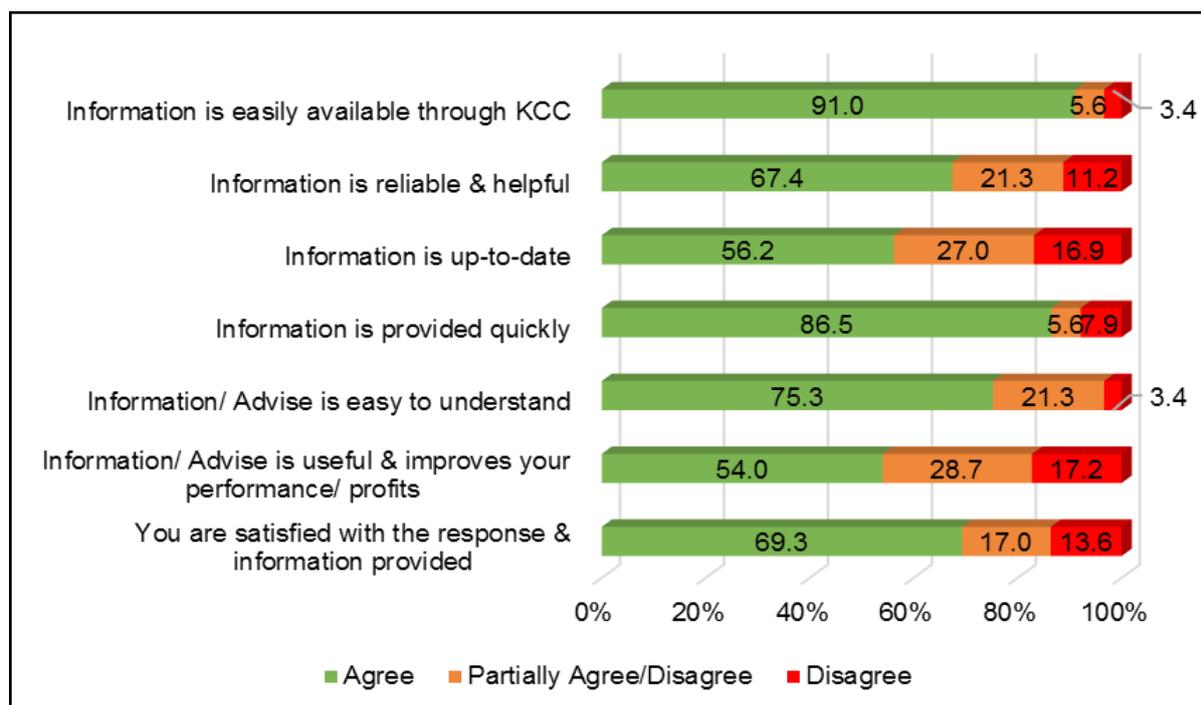


Regarding technical questions, the Table 6.8 below indicate that over 91 percent farmers find the information easily available through the KCC. However, when it comes to it being reliable and useful, the percentage drops to 67 percent and it being up to date, the percentage drops to 56 percent. The farmers indicate that the information provided is easy to understand but in terms of whether it is useful and improves the profit or performance the percentage drops to 54 percent. Overall about 69 percent that they are satisfied with the information.

Table 6.8: Response to Questions on Technical Aspects

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average
Information is easily available through KCC	16.9	74.2	5.6	3.4	0.00	4.0
Information is reliable & helpful	14.6	52.8	21.3	9.0	2.2	3.7
Information is up-to-date	15.7	40.4	27.0	14.6	2.2	3.5
Information is provided quickly	16.9	69.7	5.6	6.7	1.1	3.9
Information/ Advise is easy to understand	13.5	61.8	21.3	3.4	0.00	3.9
Information/ Advise is useful & improves your performance/ profits	6.9	47.1	28.7	11.5	5.7	3.4
You are satisfied with the response & information provided	19.3	50.0	17.0	9.1	4.5	3.7

Figure 6.6: Response to Questions on Technical Information

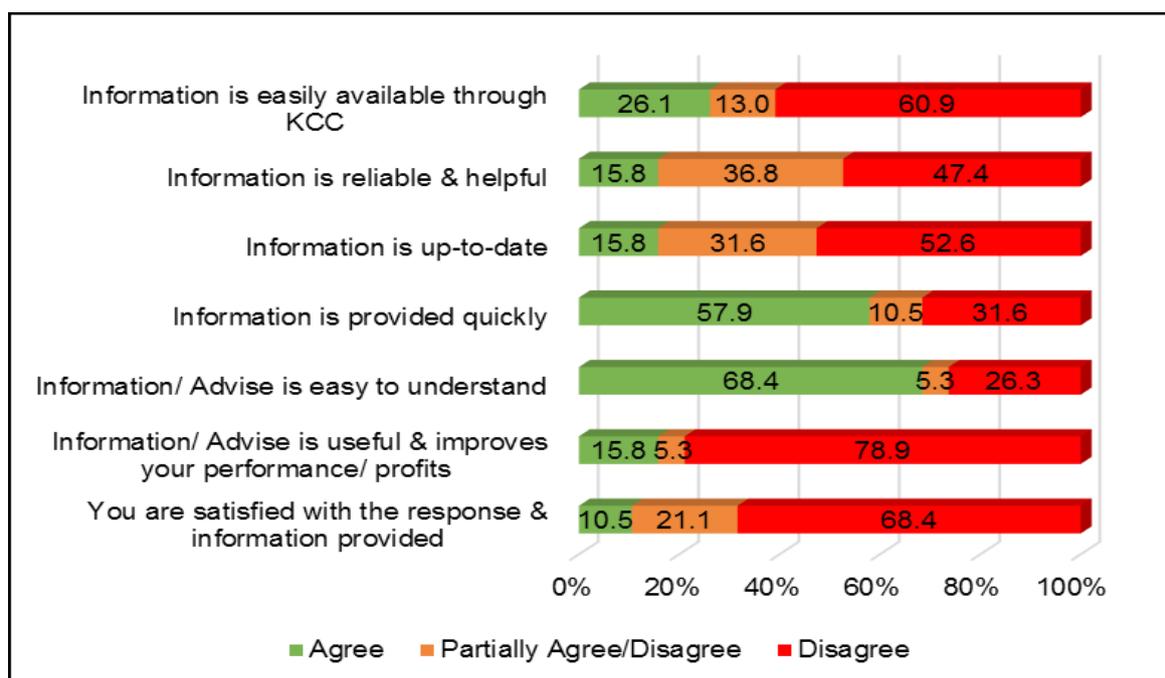


With respect to information on prices and markets, the percentages are much lower, see Table 6.9 below. Only 26 percent indicate that the information is easily available, rest 60 percent finds it difficult to access information. In terms of its help in improving performance or profits, the percentage drops to 15 percent and 78 percent found it to be not useful for improving performance/profits. Overall, 68 percent of the farmers are not satisfied with the price and market information. Gujarat KCC needs to substantially strengthen the price and market information base.

Table 6.9: Response to Price and Market Questions

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average
Information is easily available through KCC	4.3	21.7	13.0	34.8	26.1	2.4
Information is reliable & helpful	0.00	15.8	36.8	21.1	26.3	2.4
Information is up-to-date	0.00	15.8	31.6	10.5	42.1	2.2
Information is provided quickly	0.00	57.9	10.5	31.6	0.00	3.3
Information/ Advise is easy to understand	0.00	68.4	5.3	10.5	15.8	3.3
Information/ Advise is useful & improves your performance/ profits	0.00	15.8	5.3	31.6	47.4	1.9
You are satisfied with the response & information provided	0.00	10.5	21.1	21.1	47.4	2.0

Figure 6.7: Price & Market Information

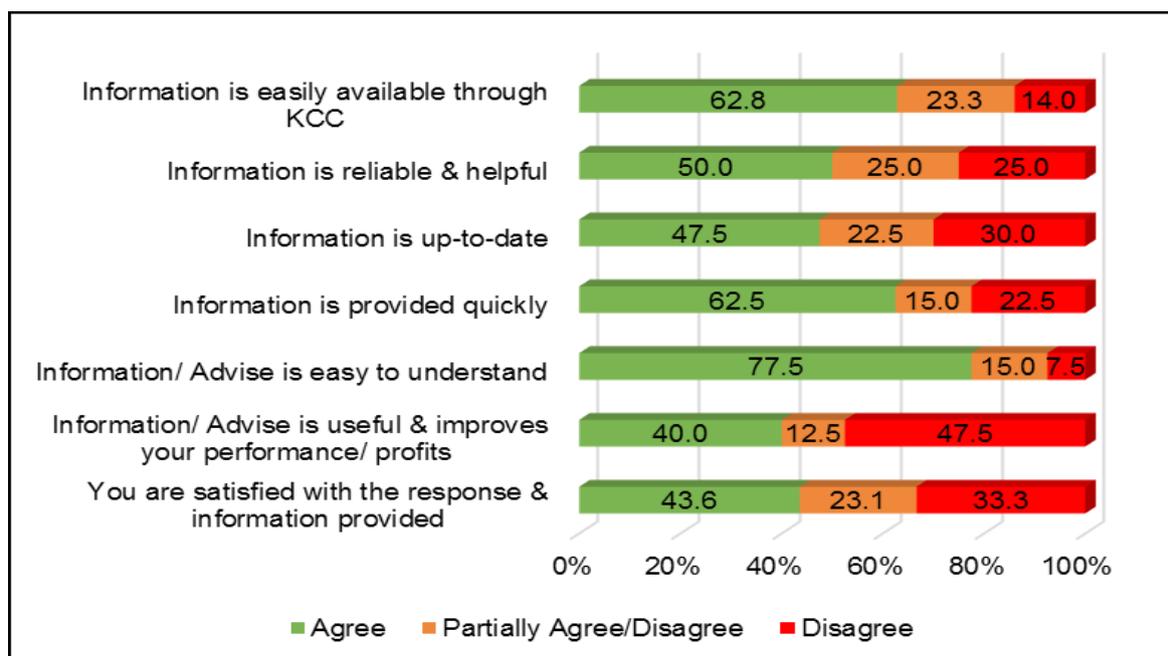


With respect to questions on government schemes, 62 percent indicate that the information is easily available and only 40 percent indicate that it is useful to improve performance or profits and 43 percent are satisfied with the information. Thus, there is substantial scope for improvement. (See Table 6.10)

Table 6.10: Response to Government Schemes Questions

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average
Information is easily available through KCC	9.3	53.5	23.3	4.7	9.3	3.5
Information is reliable & helpful	5.0	45.0	25.0	17.5	7.5	3.2
Information is up-to-date	15.0	32.5	22.5	20.0	10.0	3.2
Information is provided quickly	20.0	42.5	15.0	15.0	7.5	3.5
Information/ Advise is easy to understand	5.0	72.5	15.0	5.0	2.5	3.7
Information/ Advise is useful & improves your performance/ profits	15.0	25.0	12.5	25.0	22.5	2.9
You are satisfied with the response & information provided	10.3	33.3	23.1	15.4	17.9	3.0

Figure 6.8: Information on Government Schemes

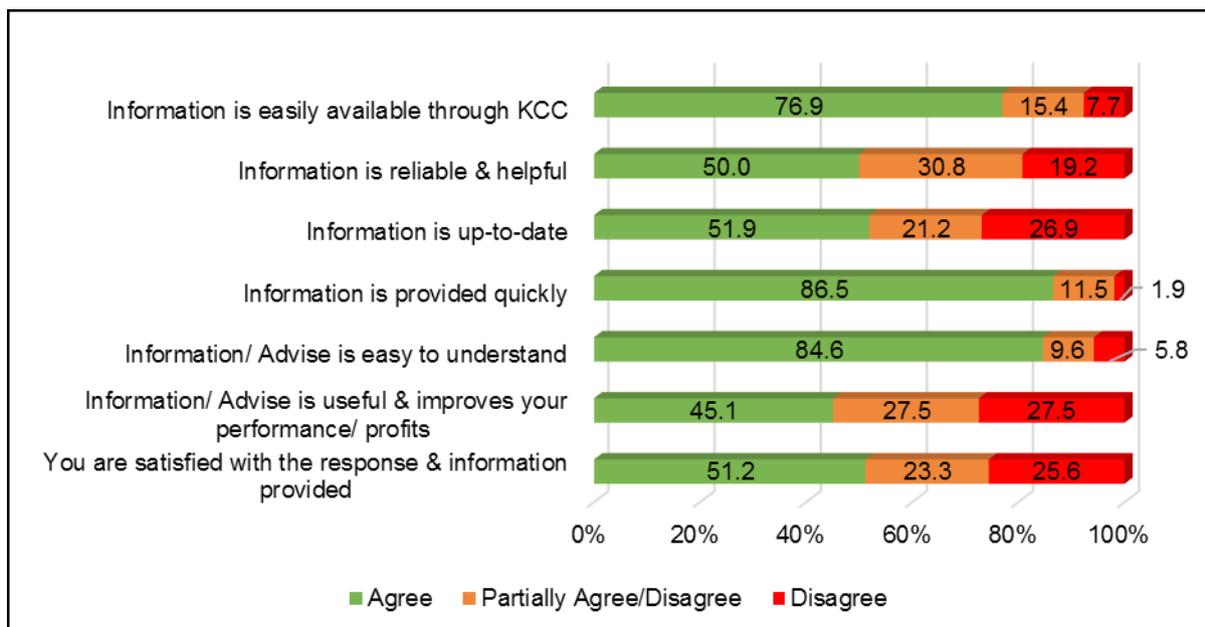


With respect to other questions such as weather, the satisfaction level is much higher, 76 percent indicate that the information is available easily. However, only 55 percent indicate that it is reliable and helpful. Only 45 percent indicate that it helps improve profit or performance, and 51 percent indicate that they are satisfied overall with the information. Thus, there is substantial scope for improvement. (See Table 6.11)

Table 6.11: Response to other Questions (Weather, Services, Events etc.)

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average
Information is easily available through KCC	11.5	65.4	15.4	3.8	3.8	3.8
Information is reliable & helpful	13.5	36.5	30.8	15.4	3.8	3.4
Information is up-to-date	13.5	38.5	21.2	23.1	3.8	3.4
Information is provided quickly	17.3	69.2	11.5	1.9	0.00	4.0
Information/ Advise is easy to understand	13.5	71.2	9.6	5.8	0.00	3.9
Information/ Advise is useful & improves your performance/ profits	7.8	37.3	27.5	21.6	5.9	3.2
You are satisfied with the response & information provided	14.0	37.2	23.3	9.3	16.3	3.2

Figure 6.9: Information on other Questions (Weather, Services, Events etc.)



The need for information comes from the important decisions that farmers have to make and these in turn would be driven by the objectives that the farmers wish to pursue in their farming. The table 6.12 below provides an assessment of the importance given by the farmers and different objectives they may wish to pursue. The results indicate that the most important objective indicated by the farmers is achieving high yields followed by good choice of crops/farm activities. The important secondary objectives related to this are indicated as obtaining the best price for the output, good quality of the output, efficient input use, and best profits/income. The results indicate that all the decisions closely related to these objectives would be of very high importance to the farmers and therefore information which can help the farmers make these decisions better would be of great value to them, as well as to improve their performance. Even though almost all the stated objectives are widely indicated as very important to extremely important, those that show a little less importance include reducing the risk which is surprisingly considered only moderately, slightly or unimportant by the majority of the farmers, and on consumption needs which is similarly considered less important by almost 45 percent of the farmers. However, personal achievement and knowledge as well as personal safety and health are considered very or moderately important by only 45 percent of the farmers.

Table 6.12: Major Objectives/ Decisions you Focus on in your Farming

	Extremely Important	Very Important	Moderately Important	Slightly Important	Not Important	Average
Good Choice of Crops/ Farm activities	46.4	46.4	7.2	0.00	0.00	4.4
High Yields	64.9	34.0	1.0	0.00	0.00	4.6
Good Quality of Output	40.6	50.0	8.3	1.0	0.00	4.3
Efficient Input Use	33.0	63.9	3.1	0.00	0.00	4.3
Least Cost of Production	18.6	42.3	35.1	4.1	0.00	3.8
Marketability of Output	6.3	25.0	41.7	19.8	7.3	3.0
Best Price for Output	46.4	45.4	7.2	1.0	0.00	4.4
Best Profits/ Income	40.2	43.3	14.4	2.1	0.00	4.2
Least Crop Loss	6.3	43.8	41.7	7.3	1.0	3.5
Less Risk	10.3	38.1	35.1	14.4	2.1	3.4
Own Consumption Needs	8.2	36.1	37.1	14.4	4.1	3.3
Personal Safety & Health	9.3	38.1	19.6	19.6	13.4	3.1
Personal Achievement/ Knowledge	5.2	46.9	28.1	16.7	3.1	3.3
Respect/ Image in Community	15.5	48.5	20.6	13.4	2.1	3.6
Long Term Productivity	15.8	44.2	32.6	6.3	1.1	3.7
Better Environment	11.7	34.0	23.4	28.7	2.1	3.2

Related to the objectives, what are the decisions that are considered very important or critical by the farmers? The Table 6.13 below provides responses of the farmers on different farming decisions. It indicates that some of the most important decisions are

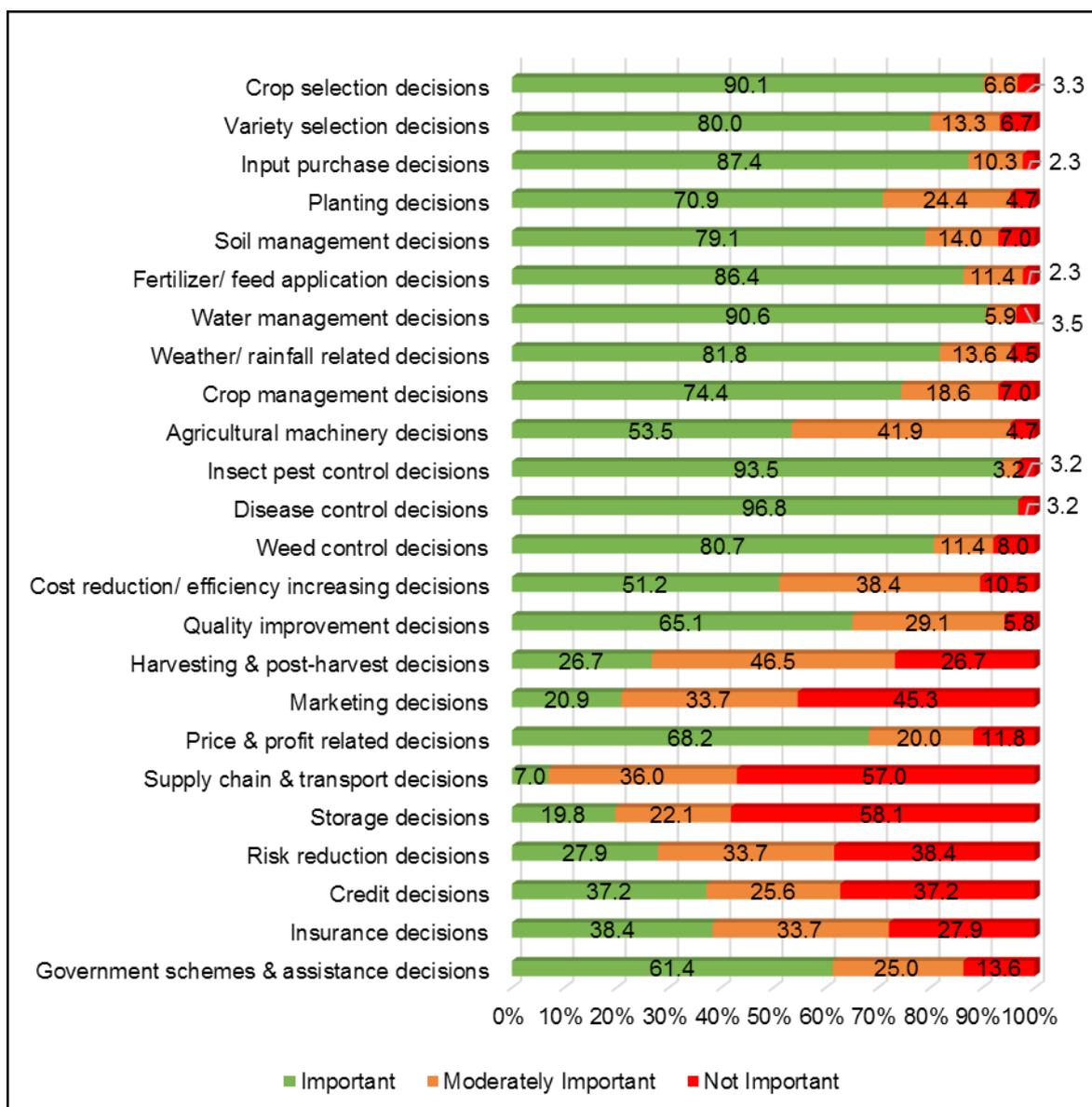
shown as insect pest control and disease control which are considered very important to extremely important by over 90 percent of the farmers. The next in importance are indicated as weathers/rainfall related decisions marked as very important to extremely important by 80 percent of the farmers. Following this, in importance are the decisions on variety selection and fertilizer/seed application decisions indicated as important to extremely important by about 70 to 80 percent of the farmers. From the responses, it appears that the decisions related to the major risk elements in agriculture which includes weather, insects and diseases hold a very high importance for the farmers. This is followed by the important choices of farm management such as the choice of variety and the choice of fertilizers and seeds. The information system facilitated through the Kisan Call Centres must make sure that it addresses these decisions, which are considered extremely important by the farmers.

Table 6.13: Importance of KCC on Important Decisions

	Extremely Important	Very Important	Moderately Important	Slightly Important	Not Important	Average
Crop selection decisions	36.3	53.8	6.6	1.1	2.2	4.2
Variety selection decisions	41.1	38.9	13.3	2.2	4.4	4.1
Input purchase decisions	35.6	51.7	10.3	1.1	1.1	4.2
Planting decisions	25.6	45.3	24.4	2.3	2.3	3.9
Soil management decisions	51.2	27.9	14.0	4.7	2.3	4.2
Fertilizer/ feed application decisions	54.5	31.8	11.4	0.00	2.3	4.4
Water management decisions	57.6	32.9	5.9	0.00	3.5	4.4
Weather/ rainfall related decisions	45.5	36.4	13.6	1.1	3.4	4.2
Crop management decisions	27.9	46.5	18.6	2.3	4.7	3.9
Agricultural machinery decisions	5.8	47.7	41.9	2.3	2.3	3.5
Insect pest control decisions	52.7	40.9	3.2	1.1	2.2	4.4
Disease control decisions	53.7	43.2		2.1	1.1	4.5

	Extremely Important	Very Important	Moderately Important	Slightly Important	Not Important	Average
Weed control decisions	39.8	40.9	11.4	5.7	2.3	4.1
Cost reduction/efficiency increasing decisions	14.0	37.2	38.4	5.8	4.7	3.5
Quality improvement decisions	34.9	30.2	29.1	1.2	4.7	3.9
Harvesting & post-harvest decisions	5.8	20.9	46.5	19.8	7.0	3.0
Marketing decisions	4.7	16.3	33.7	32.6	12.8	2.7
Price & profit related decisions	18.8	49.4	20.0	8.2	3.5	3.7
Supply chain & transport decisions	1.2	5.8	36.0	32.6	24.4	2.3
Storage decisions	4.7	15.1	22.1	36.0	22.1	2.4
Risk reduction decisions	3.5	24.4	33.7	25.6	12.8	2.8
Credit decisions	2.3	34.9	25.6	19.8	17.4	2.8
Insurance decisions	9.3	29.1	33.7	15.1	12.8	3.1
Government schemes & assistance decisions	14.8	46.6	25.0	9.1	4.5	3.6

Figure 6.10: Importance Given to Different Farm Decisions



Given these decision-making needs, what is the kind of information needed by the farmers. The results of this are given in the Table 6.14 below. The information frequently mentioned as required includes: Information on good quality and high yielding varieties, Information on fertilizers and its application, Information on application of pesticide and its measurements, The most frequently required and information on variety selection has the highest importance rating.

Table 6.14: Information Needs for Decision Making in Agriculture

Agriculture-Field Crops			
Decisions	Information needed for decision making	Frequency %	Average Importance Rating (Weighted)
Variety selection	Information on good quality and high yielding varieties	27.6	4.4
	Information on good quality and high yielding varieties, and also pest resistance	8.2	
Fertilizer use	Information on physical identification of seeds	7.1	4.3
	Information on fertilizers and its application	60.2	
	Fertilizer name	33.7	
Pesticide use	Information on natural fertilizers and its application	6.1	4.3
	Application of pesticide and its measurements	66.3	

Against the information needs, what is the information provided by the KCC and how do farmers rate it? The responses on this are summarized in the Table 6.15 below. The most frequent in this are: Suggested variety name, suggested fertilizers name, quantity and usage, Suggested pesticide name, quantity and usage. Few farmers also complained about getting no information.

Table 6.15: Information Provided by KCC

Decisions	Information provided by KCC	Frequency %	Average Rating (Weighted)
Variety selection	Suggested variety name	9.2	3.0
	Suggested Seeds Name and way of applying	2.0	
	Suggested Seeds Name and way of applying	2.0	
	No information given	2.0	
Fertilizer use	Suggested fertilizers name, quantity and usage	31.6	3.4
	Suggested fertilizers name	6.1	
	Suggested traditional method	4.1	
Pesticide use	Suggested pesticide name and its applications	57.1	3.2
	Provided very common and outdated information	2.0	
	Suggested poison name only	1.0	

What are the other sources of information for the farmers and what are their ratings? Responses on this are examined in the Table 6.16 below. The most frequently mentioned other source of information is experience and tradition method for variety selection, agro shop for fertilizer and pesticide.

Table 6.16: Other Sources of Information

Decisions	Other sources of information	Frequency %	Average Rating (Weighted)
Variety selection	Fellow Farmers	14.3	3.7
	Experience and Traditional Method	22.4	
	Agro Shop	10.2	
Fertilizer use	Fellow Farmers	16.2	3.7
	Agro Shop	22.2	
	Experience and Traditional Method	13.1	
Pesticide use	Fellow Farmers	17.3	3.6
	Agro Shop	27.6	
	Experience and Traditional Method	12.2	

What are the some of the comments on the information gaps stated by the farmers? This is examined in the Table 6.17 below. The most frequently mentioned comments are: need for up to date information on latest seeds, need for information on fertilizers that are effective & known, information on pesticide that is effective and up to date.

Table 6.17: Important Gaps/ Deficiency

Decisions	Important gaps/deficiency	Frequency %
Variety selection	Requires up to date information on latest seeds	11.2
	Suggest information according to land/soil	2.0
	Should suggest seeds which are used by fellow farmers	2.0
Fertilizer use	Information regarding application of the fertilizers is required	16.0
	With poison name medicine name should be suggested	1.0
	KCC should be provide up to date information	1.0
	Information regarding fertilizers	1.0
Pesticide use	KCC should provide effective information	23.5
	KCC should provide information on how to apply	8.0
	KCC should suggest companies name	3.0

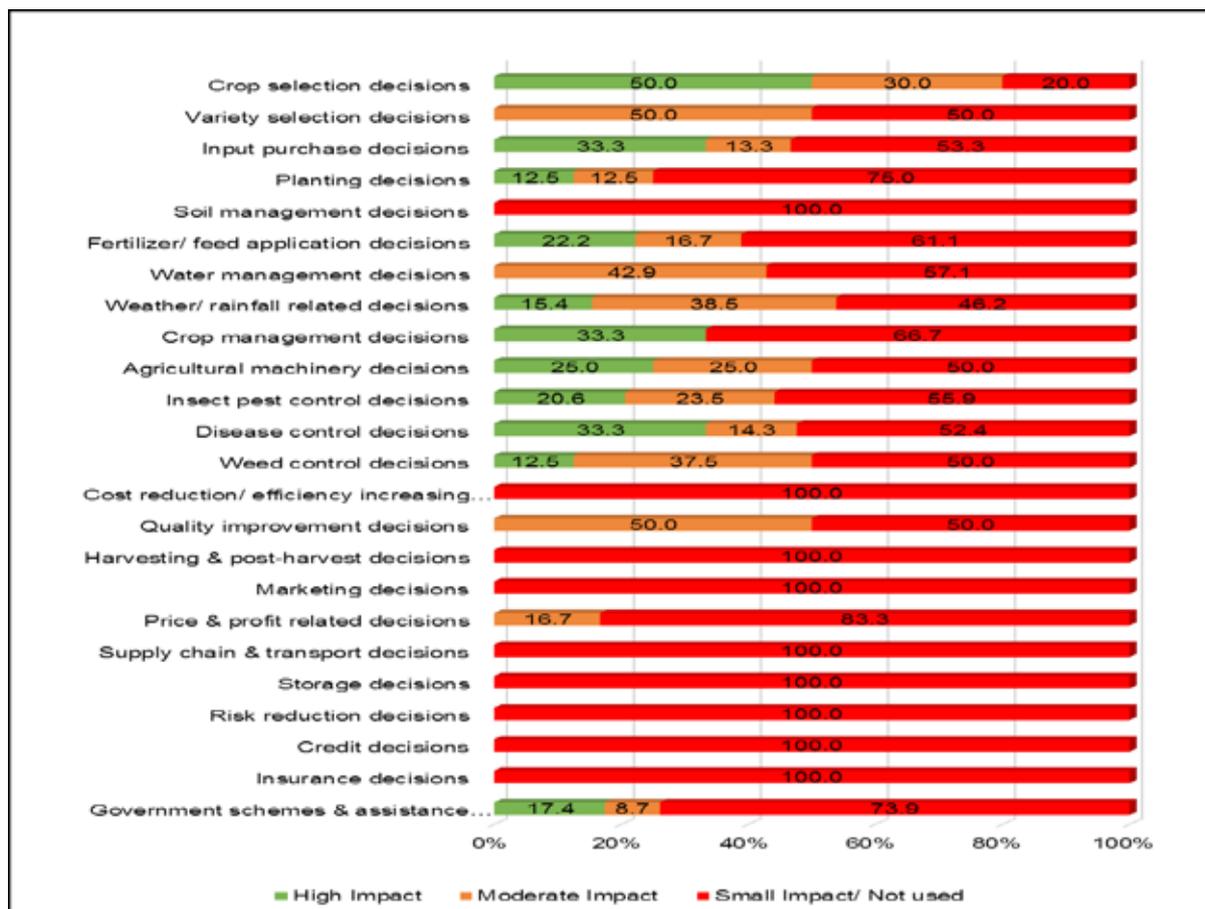
In terms of the current impact of the Kisan Call Centres on improving decisions and creating an impact, the responses of the farmers are given in the Table 6.18 below. The responses indicate that the impact is currently somewhat limited and falls mainly within the range of moderate impact to small impact. The best impact is indicated with respect to crop selection, input purchase, crop management and disease control, where it is indicated that the KCC are having moderate to high impact for 50 to 33 percent of the farmers. This is followed by impact on weather related decisions where it is having a moderate or better impact for about 50 percent of the farmers. Decisions

related to variety selection and fertilizer/seed applications also show moderate or better impact for a small number of farmers. However, many other decisions such as harvest and post-harvest or quality improvement and efficiency improvement are showing very little or no impact of the Kisan Call Centres.

Table 6.18: Impact of KCC on Important Decisions

	Huge Impact	Significant Impact	Moderate Impact	Small Impact	No Impact	Average
Crop selection decisions		50.0	30.0		20.0	3.1
Variety selection decisions			50.0	35.0	15.0	2.4
Input purchase decisions		33.3	13.3	26.7	26.7	2.5
Planting decisions		12.5	12.5	37.5	37.5	2.0
Soil management decisions				40.0	60.0	1.4
Fertilizer/ feed application decisions	5.6	16.7	16.7	50.0	11.1	2.6
Water management decisions			42.9	28.6	28.6	2.1
Weather/ rainfall related decisions	7.7	7.7	38.5	38.5	7.7	2.7
Crop management decisions		33.3		33.3	33.3	2.3
Agricultural machinery decisions		25.0	25.0	25.0	25.0	2.5
Insect pest control decisions		20.6	23.5	23.5	32.4	2.3
Disease control decisions	2.4	31.0	14.3	19.0	33.3	2.5
Weed control decisions	6.3	6.3	37.5	25.0	25.0	2.4
Cost reduction/ efficiency increasing decisions				75.0	25.0	1.8
Quality improvement decisions			50.0		50.0	2.0
Harvesting & post-harvest decisions				33.3	66.7	1.3
Marketing decisions					100.0	1.0
Price & profit related decisions			16.7		83.3	1.3
Supply chain & transport decisions					100.0	1.0
Storage decisions					100.0	1.0
Risk reduction decisions					100.0	1.0
Credit decisions				66.7	33.3	1.7
Insurance decisions					100.0	1.0
Government schemes & assistance decisions	13.0	4.3	8.7	17.4	56.5	2.0

Figure 6.11: Areas of Impact of KCC Information on Farm Decisions



What are the responses on the stated impact of KCC information on production and incomes? The overall summary across all the crops is given in the Table 6.19 below. The majority of the farmers (more than 70 percent) indicate that there is some positive impact of the KCC information on their production and incomes. About 26 percent indicate that there is a small impact, and about 23 percent farmers indicate that there is a moderate to large impact.

Table 6.19: Overall Impact of KCC

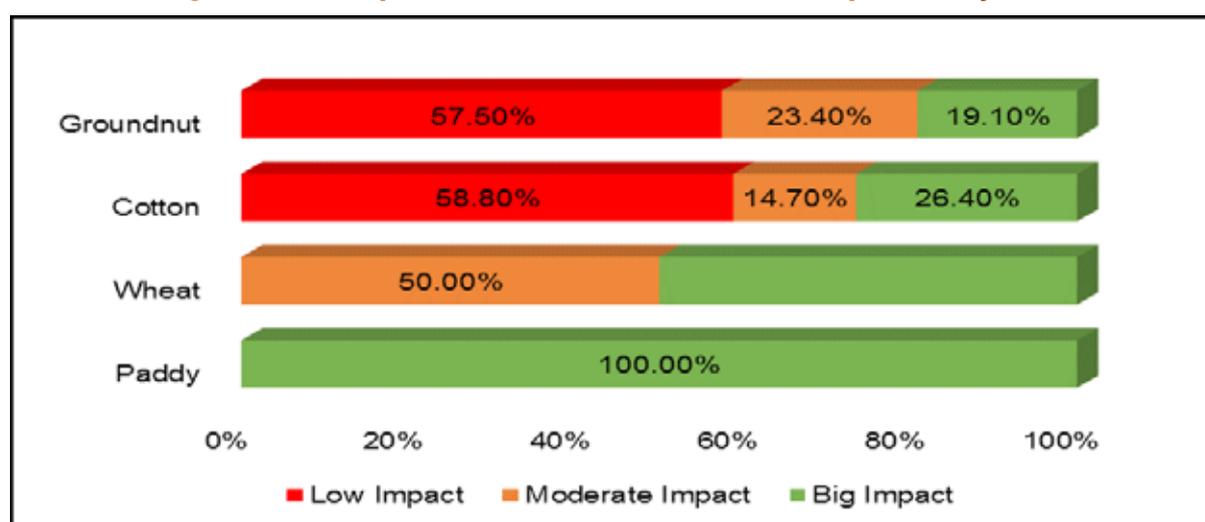
	Huge Impact	Significant Impact	Moderate Impact	Small Impact	No Impact
Impact on Production	8.8	13.2	24.2	26.4	27.5
Impact on Income	6.6	14.3	33.0	19.8	26.4

To obtain more specific information, the question of impact is also examined crop wise. The Table 6.20 and Figure 6.12 below provide an analysis of the response on production crops-wise. The results indicate that KCC information is having a good impact on production in the crops of paddy and wheat, and some impact on cotton and groundnut.

Table 6.20: Impact of KCC on Production – Crop/ Activity wise

Top crops/ activity based on overall crops/ activity	% frequency (Valid Percent)	No Impact	Small Impact	Moderate Impact	Significant Impact	Huge Impact
Groundnut	51.6	27.70%	29.80%	23.40%	10.60%	8.50%
Cotton	37.4	29.40%	29.40%	14.70%	17.60%	8.80%
Wheat	2.2	0.00%	0.00%	50.00%	50.00%	0.00%
Paddy	1.1	0.00%	0.00%	0.00%	0.00%	100.00%

Figure 6.12: Impact of KCC on Production – Crop/ Activity wise



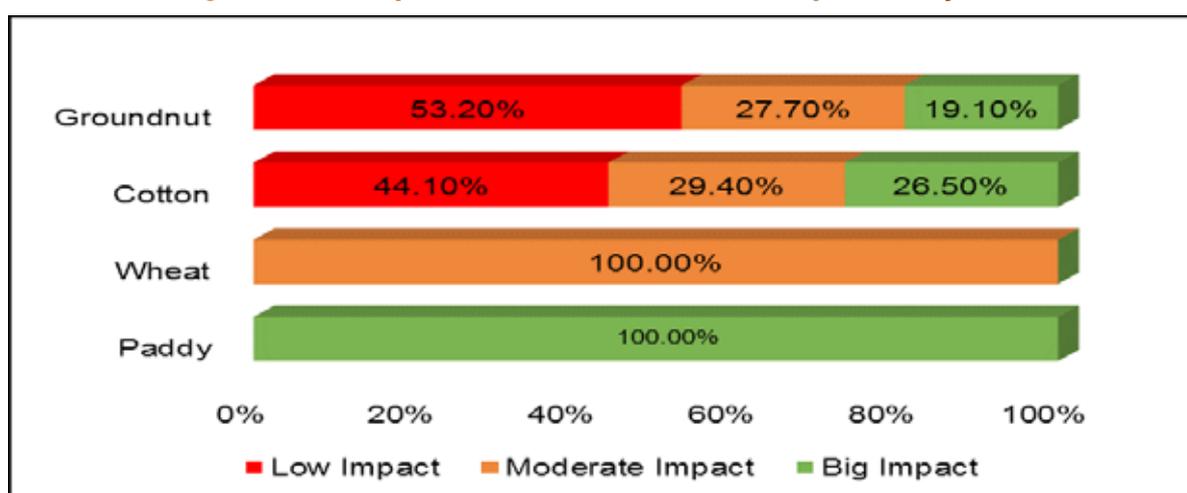
Regarding the impact on incomes by crop, the results are given in the Table 6.21 and Figure 6.13 below. The results indicate impact of KCC on the incomes is seen in the case of, paddy, wheat, cotton and groundnut. Thus, the KCC information is reported to produce benefits for farmers in some important crops.

In the survey it was found that the dominant crops grown vary by survey district location, and each crop has its own problems for which farmers require up-to-date information. By and largely farmer need information for crops which are important and have a high risk of getting damaged. For example, in the north Gujarat districts such as Banaskantha, crops such as Cumin (Jeera) are major and have a lot of risk. Thus, farmers frequently call the KCC for information on pesticide use and disease control in Cumin. On the other hand south-west Gujarat districts such as Rajkot & Junagadh, and south Gujarat districts such as Surat, cotton is often the dominant crop, and farmers frequently call for up to date and reliable information on cotton farming, especially pest & disease control in cotton.

Table 6.21: Impact of KCC on Income – Crop/ Activity wise

Top crops/ activity based on overall crops/ activity	% frequency (Valid Percent)	No Impact	Small Impact	Moderate Impact	Significant Impact	Huge Impact
Groundnut	51.6	25.50%	27.70%	27.70%	17.00%	2.10%
Cotton	37.4	29.40%	14.70%	29.40%	14.70%	11.80%
Wheat	2.2	0.00%	0.00%	100.00%	0.00%	0.00%
Paddy	1.1	0.00%	0.00%	0.00%	0.00%	100.00%

Figure 6.13: Impact of KCC on Income – Crop/ Activity wise



The Table 6.22 below provides the overall assessment given by the farmers regarding the Kisan Call Centres. A majority of the farmers consider the overall assessment of the performance of KCC to be good, though a large number consider the performance to be just satisfactory. In terms of response efficiency, nearly 52 percent of the farmers consider this to be good to excellent and in terms of the quality of the information provided, only 33 percent are happy with it. Thus, there is considerable scope for improvement. However, overall, a large majority of about 90 percent of the farmers would like the Kisan Call Centres to be continued. This indicates that farmers find the Kisan Call Centres helpful and would like this scheme to be continued.

Table 6.22: Overall Assessment

	Excellent	Good	Satisfactory	Somewhat Poor	Very Poor	Average
Overall assessment of the performance of the Kisan Call Centre	8.2	49.0	30.6	12.2		3.5
Overall assessment for the response and efficiency of Kisan Call Centre	4.1	48.0	31.6	13.3	3.1	3.4
Overall assessment of the quality of information provided by Kisan Call Centre	3.1	30.6	33.7	23.5	9.2	2.10

	Strongly Agree	Agree	Partially Agree/Disagree	Disagree	Strongly Disagree	Average
Overall opinion whether the Kisan Call Centre should be continued	26.8	70.1	2.1	1.0		4.2

Figure 6.14: Overall Assessment

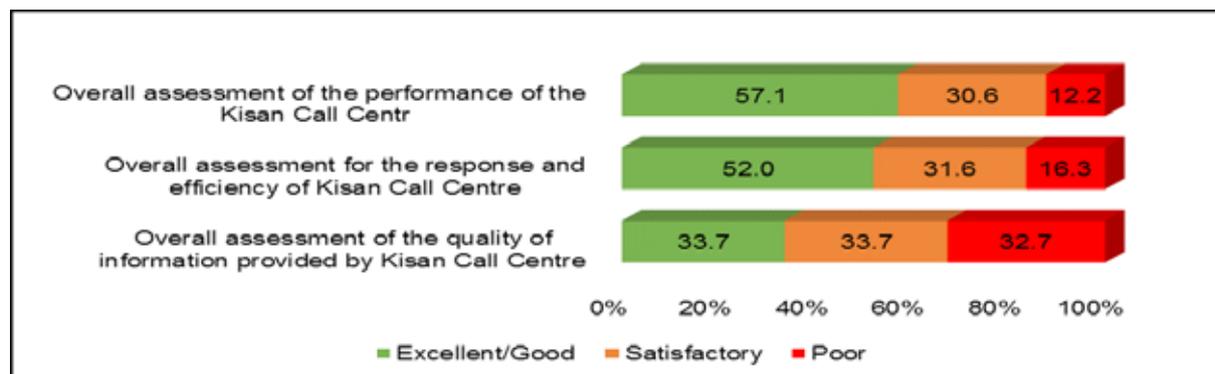
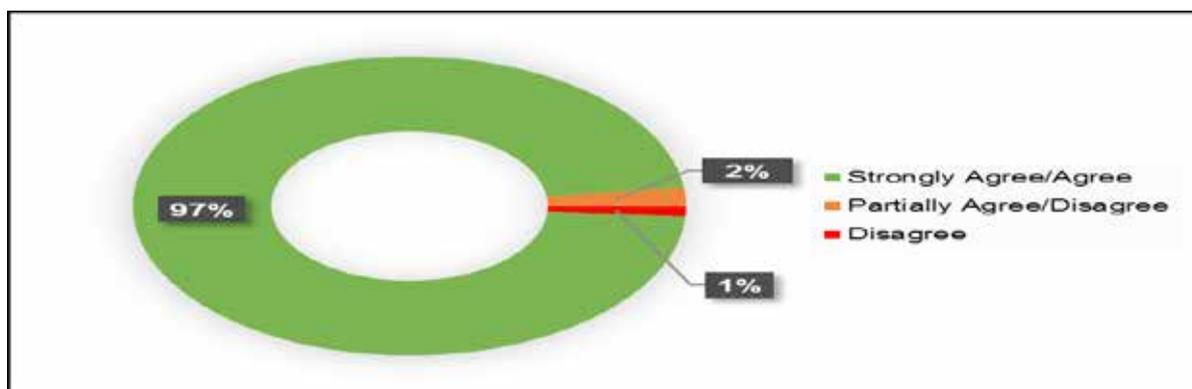


Figure 6.15: Overall Opinion of the Farmers on Continuation of Kisan Call Centres



Chapter 7

Conclusions & Recommendations

The study has examined the design and performance of the major Government of India scheme of Kisan Call Centres (Farmer Call Centres). The scheme was launched in 2004 with the objective of improving the delivery of extension services and information to the farmers by leveraging the rapid development of the telecommunication infrastructure and services in the country. The Kisan Call Centres (KCCs) respond on the spot to questions related to agriculture asked by farmers. Farmers need information on a large number of technical and economic matters to manage their farms successfully in the world today. The information helps them to make correct decisions on various critical matters such as the crop to plant, the variety to use, the inputs to apply, and practices to follow. Inadequate and imperfect information leads to poor decisions, poor crop performance, and even crop failure and suicides.

The objectives of the research were to study the design, implementation and performance of the government scheme of Kisan Call Centres (KCC), primarily, and to also look at the related systems of Kisan Knowledge Management System (KKMS), Farmers Portal, and M-Kisan Portal. The study is conducted in coordination with Agro Economic Research Centres (AERCs) in five different sample states. It is coordinated by Centre for Management in Agriculture (CMA), Indian Institute of Management Ahmedabad (IIMA). The 5 states-Kisan Call Centre units selected for coverage include Punjab – Chandigarh, Gujarat – Ahmedabad, Maharashtra – Pune, Karnataka – Bangalore, and Assam – Guwahati.

For our present study in Gujarat Kisan Call Centre it covered 27 Farmer Tele Advisors at these Gujarat Kisan Call Center. The study also covers a sample of 120 farmers in

Gujarat including 98 KCC users and 22 non-users. The data profile indicates that FTAs are all well qualified for the jobs with primarily agriculture related degrees and the right backgrounds. The users are somewhat more educated and younger than the non-users but even illiterate farmers are among the user, and they are found to be from all social backgrounds.

Findings

- An examination of the KCC-KKMS database indicates that a huge number of over 61 lakh live calls were received and recorded at the KCCs in the country in 2016-17. If the IVR system calls are added, the total number of calls recorded in the system rises to 80 lakh calls. Out of the total calls, Gujarat received 2.3 lakh calls. Data for the top crops in state shows that Cotton and Groundnut has the largest share. Examining the broad reasons for calling, it is found that the highest number of calls recorded are for weather information, followed after a margin by plant protection, cultural practices and then government schemes, field preparation, fertilizer use/availability, and then market information. Weather and plant protection are major in all of them – indicating that concerns of risk are a major reason for calling.
- Assessment of the Centres by the Centre supervisors indicates that a large number of calls are received every day, but the handling of the calls by FTAs is conveyed to be needing improvement. The communication between the FTA and farmers is good. The performance of the hardware and software is reported to be good and the internet connectivity is good. There is also dissatisfaction with respect to infrastructure and service support in Gujarat Kisan Call Centre. Though the information is available on time, and easy to understand, there are some problems in the farmers understanding and processing of the information and farmer satisfaction with the information. There is considerable dissatisfaction with the systems and policies of the call centres, but the performance and usefulness of KCC is reported to be good to excellent and all of Centres agree/ strongly agree that the KCC should continue.
- Assessment of the FTAs shows that about 81 percent of the FTAs find the hardware to be adequate and working well. They find the display to be good and the hardware can handle the call load on a daily basis. Whereas 96 percent find the hardware to be good for the work requirement. About 81 percent of the FTAs feel that the software is up to date, fast and user friendly. However, a large number indicate difficulty with the internet speed and many indicate that it frequently breaks down and slows down work.

- The FTAs depend on many information sources for answering questions. The main source used is self-knowledge and colleagues & supervisors, and over 81 percent indicate that their self-knowledge and colleagues & supervisors is excellent to good. Internet search is also considered good to excellent by nearly 85 percent of the FTAs, and over 55 percent indicate excel sheets and prepared materials as well as knowledge acquired in training as good to excellent. However, a large number of more than 74 percent indicate the inadequacy of extension booklets and government department sources and materials, and a very large number indicate the inadequacy of university experts, and nodal officers.
- The KKMS website is used almost all the time by the FTAs during their work and they indicate that the website is easy to use, clear and well organized. However, the response of the website is often slow and the information on it is often not up to date. The website also has the problem of often crashing or responding slowly during use, and retrieving information and making changes in recorded information is often difficult. With respect to the farmers' portal website, FTAs of Gujarat Kisan Call Centre do not use. Also, awareness among the FTA's was very less. With respect to the M-Kisan portal website, there appears to be quite wide dissatisfaction and it is not very frequently used.
- Regarding the call answering systems of the KCC, the FTA survey results indicate that to a large extent the calls are handled well and FTAs are able to handle and answer the questions themselves. Those they are not able to handle appear to be answered by colleagues and supervisors substantially. The escalation to level 2 is not working very well in most cases and these calls are frequently not well attended and not speedily attended to by the state agriculture experts. The escalation to level 3, fares even worse and the nodal officers do not often attend to the questions even through SMS or other means.
- On the overall assessment of KCC, nearly 62 percent of FTAs consider the KCC performance to be good to excellent but over 33 percent see scope for improvement. In terms of their own contribution at the KCC, over 70 percent considered to be good to excellent. Regarding the systems and policies under which the KCC is working, there is considerable dissatisfaction with nearly 85 percent considering this to be in the range of poor to satisfactory. Regarding the usefulness of the KCC to the farmers and the state agriculture, over 74 per cent consider this to be good to excellent. All the FTAs are of the opinion that the Kisan Call Centre scheme should be continued.

- The survey of 120 farmer users shows that in terms of frequency of use of the different sources of information, KCCs have risen to be frequently or very frequently used by 60 percent of the farmer users, but extension worker are at 80 percent, and fellow farmers at 75 percent. After a large margin follow input dealers which stand at 49 percent and cooperative societies at 41 percent. This shows that Kisan Call Centres still have scope for improvement. In terms of the quality or usefulness of information available from different sources, the highest score is obtained by extension workers (4.13) followed by cooperative societies (4.12), fellow farmers (3.80), input companies (3.69), KVK (3.63) followed by Kisan Call Centres (3.54). 86.67 percent of the users rate extension workers as good to excellent source of information, followed by 76.47 percent for cooperative societies, with Kisan Call Centres at 59.18 percent. This indicates that even though the Kisan Call Centres have done well, there is considerable scope of improvement.
- Analysis of the number of calls made by the farmer users shows that on an average a user made 30 calls per year to the Kisan Call Centres. The data indicates that the average waiting time is 2.2 minutes per call. The percentage of calls not answered was 10.2, calls dropped was 5.8 percent, and calls were no proper answer was given was 13.5 percent. On the whole the users reported that the calls that were effectively answered were only 45.7 percent. The maximum number of calls were regarding technical information and these constituted 33.1 percent of the calls. This was followed by weather at 31.4. percent. Overall, the data indicates that the call efficiency is not satisfactory with only 45.7 percent of the calls being seen as effectively answered - there is scope of improvement.
- On call response efficiency and quality, 92 percent of the users indicate that the KCC toll free number is easy to reach and 73 percent report that the wait for KCC to pick up is not too long. More than 88 percent of the users indicate that the voice reception over the phone is clear and over 75 percent report that the call drops are not frequent. Nearly 87 percent indicate that the FTAs greets and speaks courteously and understands and responds in the local language. Over 70 percent report that the FTA understands the question or problem easily and provides answers in a clear and understandable way. Also, when it comes to the usefulness of the answer and solving of the problem the percentage is 72 percent. Regarding the escalation of the call to higher authorities, experts or nodal officer, the responses indicate that this is not satisfactory. However, overall, in terms of the call handling efficiency, over 73 percent agree that it is good.

- On the impact of KCC information, results indicate that the impact on decisions is currently somewhat limited, high in a few cases and mainly moderate impact to small impact. The best impact is indicated with respect to crop selection and followed by impact on weather related decisions, variety selection and fertilizer/seed applications and marketing decisions. Regarding impact on production and incomes, majority of the farmers indicate that there is some positive impact of the KCC information on their production and incomes: 26 percent indicate small impact and 23 percent indicate moderate to large impact. The impacts vary substantially by crop, and a big impact on production and incomes is reported for paddy and wheat.
- In overall assessment given by the farmers regarding the Kisan Call Centres, 50 percent of the farmers consider it good. Though 50 percent consider it to be satisfactory. Nearly 52 percent of the farmers consider the call response efficiency this to be good to excellent, and in terms of the quality of the information provided, about 33 percent consider it to be good. Overall, a large majority of about 97 percent of the farmers would like the Kisan Call Centres to be continued.

Recommendations

- In a short span of years, the Gujarat KCC is becoming a frequently used source of information by the farmers, exceeding input dealers, KVKs and universities. This is a significant achievement. They still need to improve over fellow farmers and extension workers in Gujarat. The KCC system is receiving a large amount of call traffic from the farmers of about 2.3 lakhs per year in Gujarat. 97 percent of the farmer users want the KCC scheme to continue.
- There is substantial scope for enhancing the use of the KCC system further, and for this strong publicity to the farming community should be done - to increase awareness about KCCs, how they can help, and how to reach them, so that the user base and the call frequency can be greatly increased.
- There is great need to regularly monitor the call efficiency statistics of the KCC and seek to reduce the waiting time, the calls not answered, the call drops, and to increase the percentage of calls effectively answered. This is an area for improvement in Gujarat.
- The latest hardware and software for call handling & filtering and excellent internet connectivity is a must for the FTAs and should enable the use of photographs, useful Apps and other means of communication between the farmers and FTAs. There is also a significant need to improve the functioning of the supporting websites including the KKMS, Farmers Portal and the m-Kisan Portal.
- There are substantial inadequacies in the quality of information provided by the KCC. The information base available with the KCCs/ FTAs to answer farmers' questions needs to be hugely improved – without this, the system will not be very useful and will not have much impact. The information needs to be made comprehensive, extensive and up to date and put into a quick access digital database system. A special Unit should be setup to build and maintain such a database.
- Escalation of questions to higher levels is not working in Gujarat KCC. A special in-house unit of experts should be setup in KCC to continuously access, compile, and update the required knowledge base and provide it to the FTAs. The unit could consist of qualified experts or even of qualified or experienced FTAs who are dedicated to this task. They should create, build and maintain the quick access digital database for the FTAs mentioned above.
- Weather information is a significant reason for calling and should be substantially

strengthened and kept up to date. The information on government schemes is another major reason for calling and needs considerable strengthening. Technical information needs substantial improvement. But very importantly, there is great dissatisfaction with respect to the price and market information and so a substantial need to strengthen the price and market information database.

- Frequent and good training programmes for the FTAs are a must to regularly enhance their skills and knowledge include in system operation, and new/ better sources of information, and updating of information including on government schemes.
- Given the availability of good long-distance telecommunication technology and its growing reach, having more Centre is not be necessary – a well manned, well equipped and high expertise Centre is better than many thinly or poorly manned Centre. There is no need for local Centre – in fact, a larger aggregate Centre would better be able to share knowledge & solutions across areas/ regions.
- The FTAs play the most important role in the KCC system and need to be well compensated and supported. There is need to provide good office infrastructure facilities and create a good working environment for them, and the terms and compensation of FTAs need to be enhanced to attract the best talent, motivate them, get the good performance, and retain them. They play the most critical role in helping the farmers and delivering the KCC service.

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