Performance and Prospects of Expert Advisory Services Rendered by RAJUVAS TOLLFREE HELPLINE (1800-180-6224) among Livestock Owners of Rajasthan

राजस्थान के पशुपालकों में राजुवास टोल फ्री हेल्पलाइन (1800-180-6224) द्वारा प्रदत विषय विशेषज्ञ सलाहकार सेवाओं का कार्य संपादन एवं संभावनाएं

SIDDHARTH SINGH RATHORE
B.V.Sc. & A.H.

THESIS

Master of Veterinary Science

(Veterinary and Animal Husbandry Extension)

।पशुधनं नित्यं सर्वलोकोपकारकम्।

2018

Department of Veterinary and Animal Husbandry Extension Education,
College of Veterinary and Animal Science
Rajasthan University of Veterinary and Animal Sciences,
Bikaner – 334001 (Rajasthan)

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THESIS

Submitted to the
Rajasthan University of Veterinary and Animal Sciences,
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In partial fulfilment of the requirements for
the degree of

Master of Veterinary Science

(Veterinary and Animal Husbandry Extension)

FACULTY OF VETERINARY & ANIMAL SCIENCE

By

SIDDHARTH SINGH RATHORE
B.V.Sc. & A.H.

2018

Rajasthan University of Veterinary and Animal Sciences,
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This is to certify that the thesis entitled "**Performance and Prospects of Expert Advisory Services Rendered by RAJUVAS TOLLFREE HELPLINE (1800-180-6224) among Livestock Owners of Rajasthan"** submitted for the degree of **Master of Veterinary Science** in the subject of **Veterinary and Animal Husbandry Extension** of the Rajasthan University of Veterinary and Animal Sciences, Bikaner embodies bonafide research work carried out by **Siddharth Singh Rathore** under my guidance and supervision and that no part of this thesis has been submitted for any other degree. The assistance and help received during the course of investigation have been fully acknowledged. The draft of the thesis was also approved by the advisory committee on _____

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(SIDDHARTH SINGH RATHORE)

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ABBREVIATIONS

AIS	Agricultural Innovation Systems
a-AQUA	Almost All Questions Answered
ATIC	Agricultural Technology Information Centre
BSNL	Bharat Sanchar Nigam Limited
CDAC	Centre for Development of Advanced Computing
CIMMYT	International Maize and Wheat Improvement Center
DMI	Dynamic Market Information
FAO	Food and Agriculture Organization
FMA	Farmer Mobile Advisory
FRIENDS	Fast Reliable Instant Efficient Network for Disbursement of Services
FSC	Farm Science Centre
GDP	Gross Domestic Product
GKVK	Gandhi Krishi Vignan Kendra
GSM	Global System for Mobiles
IANS	Indo Asian News Agency
IARI	Indian Agricultural Research Institute
ICAR	Indian Council of Agricultural Research
ICRISAT	International Crops Research Institute for the Semi Arid Tropics
ICT	Information and Communication Technology
IDFPs	Improved Dairy Farming Practices
IFFCO	Indian Farmers Fertilizer Cooperative Limited
IKSL	IFFCO Kisan Sanchar Limited
ILRI	International Livestock Research Institute
ISAP	Indian Society of Agribusiness Professionals
IUMS	Integrated University Management System
IVRS	Interactive Voice Response System
KCC	Kisan Call Center
KHETI	Knowledge Help Extension Technology Initiative
KMAS	Kisan Mobile Advisory Services
KMS	Kisan Mobile Sandesh

KRIBHCO	Krishak Bharati Cooperative Limited
KRKL	KRIBHCO Reliance Kisan Limited
KVK	Krishi Vigyan Kendra
MAAS	Multimedia Agricultural Advisory System
MANAGE	National Institute of Agricultural Extension Management
m4agriNEI	Mobile based Agro-Advisory System in North-East India
MMS	Mobile Message Service
M.Sc.	Masters of Science
NDRI	National Dairy Research Institute
NSSO	National Sample Survey Organization
Ph.D.	Doctor of Philosophy
PGIVER	Post- Graduate Institute of Veterinary Education & Research
QRS	Query Redress Services
RAJUVAS	Rajasthan University of Veterinary and Animal Sciences
RLDB	Rajasthan Livestock Development Board
RML	Reuters Market Light
RTBI	Rural Technology and Business Incubator
RTHS	RAJUVAS Toll Free Helpline Service
SKNAU	Sri Karan Narendra Agriculture University
SMS	Short Message Service
SRI	System of Rice Intensification
TCIL	Telecommunications Consultants India Limited
TNAU	Tamil Nadu Agricultural University
TRAI	Telecom Regulatory Authority of India
UAS	University of Agriculture Science
UNESCO	United Nations Educational, Scientific and Cultural Organization
UK	United Kingdom
VKVK	Virtual Krishi Vigyan Kendra
VUTRC	Veterinary University Training and Research Centre

1. INTRODUCTION

Livestock plays an important role in Indian economy. About 20.5 million people depend upon livestock for their livelihood. Livestock contributed 16 per cent to the income of small farm households as against an average of 14 per cent for all rural households. Livestock provides livelihood to two-third of rural community. It also provides employment to about 8.8 per cent of the population in India. India has vast livestock resources. Livestock sector contributes 4.11 per cent GDP and 25.6 per cent of total Agriculture GDP.

Although, India is blessed with highest population of livestock but the poor net productivity is of serious concern. Because of poor information dissemination to the farmers, there exists a wide gap between technologies developed and actually being adopted or used by the farmers. According to NSSO (2015), it is estimated that 60 per cent of the farmers do not access any source of information for advanced agricultural technologies, resulting into huge adoption gap. Thus, a sustainable prosperity of livestock owners and farmers is essential for improving the overall human resource development scenario in the country. A prompt information dissemination system between research stations to end users and feedback from these end users is most needed.

Information and communication technologies (ICT) is bringing the world closer at an astonishingly faster rate, which brings people in the most remote places in earth to communicate with each other within seconds. ICT encompasses all those technologies that enable the handling of information and facilitate different forms of communication among human actors, between human beings and electronic system (Acharya *et al.,* 2013). Nowadays the use of ICT is increasing and it plays an important role in developing agriculture and also helps in socio economic development (Farooqi *et al*., 2002). Information technology includes all the devices that are used for communicating information. With the advancement of information technology, the fourth factor of production is being regarded as information along with land, labour, capital (Purohit, 2009).

The population in India is increasing day by day. The wide gap between farmer and the extension agents restricts the extension system from reaching the farmers to provide extension service. Moreover, the farmers are geographically widely scattered. This is more pronounced in a state like Rajasthan where people live in isolated homesteads. Due to this face to face dissemination of information would be costly. Another problem is that the extension agents find it difficult to reach the targeted audience. The need for field level extension personnel is estimated to be about 1.3 -1.5 million against the present availability of about 0.1 million personnel (Raj, 2015).

In conventional transmission system during last 50 years, the extension personnel of State Animal Husbandry Departments disseminated the technologies to the farmers manually. As a sequel, the technologies have not reached to the majority of farmers due to vast geography and inherent limitations of the traditional extension system. It is not possible for the present extension system to directly contact each and every farmer and to the independent livestock owners of remote areas.

Now, an unconventional method is needed to transfer the knowledge of experts in this domain to the general public of livestock holders, especially that the number of experts in new technologies is lesser than their demand in a certain domain. The transfer of knowledge from veterinary experts to livestock holders represents a bottleneck for the development of animal health care in any country (Savithramma, 2011).

It is here the role of ICT comes in to picture. ICTs, especially mobile phones can help to communicate to those who depend on the traditional communication sources. There are more than 43 mobile based extension services provided by public, private and in partnership of both private and public partnership. Some of these services are paid and some of the services are free of cost. One among the extension services that is free of cost and which is provided all over India is the Kisan Call Centre (KCC).

Among different modes and methods, Information and Communication Technology (ICT) tools have the potential to overcome the limitations of conventional information transmission system. Information Communication Technology includes a

range of technologies starting from radio, television, mobile phones, multimedia, internet, and satellite based communication systems (UNESCO, 2004). Thus, the concept of ICT ranges from traditional technologies such as the printed word to the most of the modern communication and data delivery systems. Old ICT like radio, television, video, films, slides, pictures, print media, telephone, drama, dance, group discussion, meetings, exhibitions and demonstrations, are being used to disseminate the information to the grass root level users whereas, the new ICT like digital devices such as computers, e-mail, internet, multimedia, video conference, mobile phones have the potential of providing vast amount of relevant information to rural population on timely, comprehensive and cost effective manner. Beside all ICTs, mobile phone has increased the contact intensity and emerged as one of the widely accepted and adopted instruments in most parts of the world.

Mobile communication is particularly very useful to farmers living in remote areas and economically backward regions. It facilitates immediate access to up-to-date information and faster & easy communication between farmers and information providers (Ponnusamy, 2005). A mobile phone is an Information and Communication Technology (ICT) tool used for two-way communication. Mobile phone is becoming one of the basic necessities for all types of users irrespective of the age group. The technology has completely influenced the society, development and social environment. Further, it helped to improve farmer's knowledge, increase their participation and sharing of knowledge with others. The agro-livestock sector is benefited more from mobile phones in the developing countries as it saves money, time and offers accurate advantage for farmers. It can be used to alert villagers about climate related health issues, various disease outbreaks, vaccination schedules, government schemes, insurance plans and other important livestock information well in time. As such, mobile phones have been regarded as the widely accessed tool among the farmers for communication and also accessing agriculture-related information. India has second largest number of smart phone users in the world having 220 million smart phone users including 80 million users in rural areas which shows the revolutionary insight of the country's agriculture growth capacity. Mobile telephony has emerged as the smart technology of choice of the majority of the urban and even the rural masses (Ansari and Pandey, 2013).

Muthiah *et al.* (2013) on his study of mobile Multimedia Agricultural Advisory System: challenges and lessons from Tamil Nadu showed that the Indian Institute of Technology, Madras's Rural Technology and Business Incubator (RTBI) in India developed a multimedia agricultural advisory system (MAAS) which shows farmer can raise a query using their mobile phone to an agricultural expert. When a farmer telephonic calls, a call centre like interface with personalized information pops up at the expert's end which views the farmer's dashboard and analyses the situation and query based advice is provided to the farmer.

KVK, Chhindwara, Madhya Pradesh implemented a programme called "Kisan Mobile Sandesh" for giving bulk SMS to the farmers. From the year 2010 onwards large numbers of ICAR- KVKs have been disseminating farm information by Kisan Mobile Advisory Services (KMAS). Likewise, "Mandi on Mobile" service launched by Bharat Sanchar Nigam Ltd. (BSNL) in Uttar Pradesh, which has teamed up with the Uttar Pradesh Agricultural Marketing Board (Mandi Parishad) to benefit the farmers, especially those who used to sell their agriculture products to middlemen at low prices without knowing the market rates (IANS, 2008).

Tamil Nadu Agricultural University (TNAU) and Centre for Development of Advanced Computing (TNAU-CDAC), Hyderabad freely providing Dynamic Market Information (DMI) or daily market information to ten thousand farmers through mobile based SMS in the local language at free of cost (Anandaraja *et al.,* 2011). VKVK (Virtual Krishi Vigyan Kendra), a simple messaging system based platform send SMS alerts in form of agro-advisories to the farmers. Voice-based advisory also being tested in some selected districts of Uttar Pradesh, Uttarakhand and Karnataka (ICRISAT, 2012). Mobile based Agro-Advisory System in North-East India (m4agriNEI) is a mobile based pull and push system where agriculture related information can be pulled by the farmers and pushed by the advisory service providers using their mobile phones. IVRS, smart phone application, web application, expert support system and centralized database are the main features of this system. m-Kisan project aims to reach-out one million small land holders in the states of Uttar Pradesh, Bihar, Madhya Pradesh, Maharashtra, Andhra Pradesh and Karnataka in India, over a 24 month period (ILRI project profile, 2012). Bihar Agricultural

University, Sabour, has started a Kisan Helpline (0641-2451035) application for the farmers to resolve their queries by agricultural scientists of different stream.

Government has launched many mobile advisory apps for farmers such as Kisan-Suvidha mobile app, Pusa Krishi app, Agri market app, e-NAM Crop insurance app and E-pashu-haat portal. Many private sectors and NGOs also started various advisory services like Lifelines India, Fisher Friend, Indian Society of Agribusiness Professionals (ISAP) - Query Redress Services (QRS), IFFCO Kisan Sanchar Limited (IKSL), Reuters Market Light (RML), Farmer's Helpline by Chambal Fertilisers and Chemicals Limited, m-KRISHI by TATA Consultancy Services, Nokia Life Tools, KHETI (Knowledge Help Extension Technology Initiative), Behtar Zindagi (Better Life), Mobile based Crop Nutrient Management Decision Support System, Aawaz De (Give your voice), Spoken Web, Fasal, KRIBHCO Reliance Kisan Limited (KRKL), Video-kheti, Mandi-Bhav, Kisan-Sanchar, Warana Unwired, Mobile Multimedia Agriculture Advisory System (MAAS), Kisan SMS Portal, a-Aqua Mini are also providing mobile advisory services to farmers and livestock owners.

The Telecom sector witnessed substantial growth in the number of subscribers. The number of telephone subscribers in India increased from 1,151.78 million at the end of December-2016 to 1,194.58 million at the end of March-2017, registering a growth of 3.7 per cent over the previous quarter. This reflects year-on-year growth of 12.82 per cent over the same quarter of last year. The overall Tele density in India increased from 89.90 in December-2016 to 92.98 in March-2017. Subscription in Urban areas increased from 683.14 million at the end of December-2016 to 692.97 million at the end of March-2017 and Urban Tele density also increased from 170.15 to 171.80 during the same period. Rural subscription also increased from 468.64 million to 501.61 million and Rural Tele density also increased from 53.27 to 56.91 during the same period. Out of the total subscription, the share of rural subscription increased from 40.69 per cent at the end of December-2016 to 41.99 per cent at the end of March-2017 (Anonymous, 2017).

In state Rajasthan, the number of telephone subscribers was 68.06 million at the end of March-2017. Out of 68.06 million subscribers, 34.58 million were rural subscribers and 33.48 million were urban subscribers. Tele density of rural

subscribers was 61.60 and urban subscribers was 186.75 and Total Tele density was 91.96 (Anonymous, 2017).

Keeping the views of above facts and scenario and to provide prompt service to the farming community, Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), Bikaner has launched TOLL FREE HELPLINE SERVICE (1800-180-6224) which was inaugurated by Hon'ble Governor of Rajasthan, Sh. Kalyan Singh ji on 16th November, 2016. The problems of livestock owners were resolved promptly through direct talks with concerned veterinary specialists. With the help of toll free service, each and every farmer from any corner of India can get the solution of their curiosity and doubts by talking to specialists and experts of RAJUVAS at anytime of twenty four hours. It responds more timely and in cost effective manner than any other extension service to the queries related to animal husbandry, raised by farmers in local language. Queries related to animal husbandry were being addressed through TOLL FREE HELPINE (18001806224). During the toll free helpline office hours (8:00 A.M to 8:00 P.M), there was an immediate response from the officials. While beyond office hours, the telephonic calls were recorded and the queries had answered from the centre on the next day.

Keeping above facts and scenario in mind, the present investigation had been taken up to study the "Performance and Prospects of Expert Advisory Services Rendered by RAJUVAS TOLL FREE HELPLINE (1800-180-6224) among livestock owners of Rajasthan".

OBJECTIVES OF THE RESEARCH

1. To study the socio-economic profile of respondents.
2. To study the categorization of queries of respondents received through RTHS.
3. To measure the extent of adoption and level of satisfaction of respondents in terms of services received from RTHS.
4. To measure the association between selected independent variables with dependent variables.
5. To find out different constraints perceived and suggestions elicited by respondents to improve the performance of RTHS.

NEED AND PRACTICAL UTILITY

1. This study would explore the utility and effectiveness of RTHS.
2. The present investigation would be useful to make effective communication linkage between university experts and livestock owners. Thus reducing the communication gap, that is utmost needed at extension point of view.
3. The above investigation would give an insight to the existing system of advisory services by RTHS which would facilitate the policy makers, academicians and administrators to take appropriate measures to improve the functioning of RTHS and overall services to farmer's community.
4. The present investigation would be useful to resolve the problem of farmers promptly while availing the above service and thus useful to improve the level of livelihood of livestock owners through effective expert advisory services.
5. The investigation would serve as a resource material for formulating best and quick alternative method or tool for dissemination of veterinary and animal husbandry related technologies and services.

LIMITATIONS OF THE STUDY

Although sincere efforts were given to collect all possible information according to the objectives, study may have certain limitations:

1. The present study had the usual limitation of time and resources invariably encountered by the student researcher.
2. The collected information was largely based on the expressed responses and perception of the respondents. Complete freedom from individual bias and prejudices cannot be claimed.
3. Results of investigation might not be applicable to other than study area.

2. REVIEW OF LITERATURE

A review of past research studies helps in identifying the conceptual and methodological issues relevant to the study. This would enable the researcher to collect relevant information and subject them to sound reasoning and meaningful interpretation. However, based on the available literature relating to the study and with best sincere effort, the review of literature has been collected both from the national and international level and the literature viewed for the purpose of study is organized and presented under the following headings:

2.1 Socio-economic profile of respondents

2.2 Categorization of the different queries

2.3 Adoption and satisfaction level

2.4 Association between selected independent variables with dependent variables (adoption and satisfaction)

2.5 Constraints perceived and suggestions elicited by respondents

2.1.1 Socio-economic profile of respondents:

Meera (2002) performed a study on critical analysis of Information Technology in agricultural development in Madhya Pradesh, Maharashtra and Andhra Pradesh and found that a little more than half of the farmers belonged to middle age (51.66%), followed by young age (37.50%) and old age (10.84%) groups.

Bondale *et al.* (2005) studied role of Kisan Call Centre in dissemination of agricultural technology and reported that most of the farmers approaching Kisan Call Centre were young (61.90%) and graduate (59.52%).

Lavanya (2006) reported in his study on formative evaluation of Kisan Call Centre in Tamil Nadu that majority (99.62%) of the telephonic calls were made by males.

Sowmyashree (2007) reported in his study on critical analysis on the functioning of Kisan Call Centres in Karnataka that majority of callers were middle

aged group, had college education, medium farm size, medium extension participation, social participation, mass media exposure and cosmopoliteness.

Bhosle *et al.* (2008) conducted a study on effectiveness of farm broadcast in transfer of agriculture technology and indicated that majority of the respondents were belonged to middle age group, secondary education, were large land holding farmers followed by small land holding farmers (22.67%).

Meera (2008) conducted a study on ICTs in agricultural extension and found that almost half of functionaries at Gyandoot and Warna functionaries were matriculates and graduates and 57 per cent of functionaries at Kisan were professionally qualified. She also found that among the farmer beneficiaries of Gyandoot ICT project, 45 per cent were young, 45 per cent middle and only 10 per cent were old. Among the beneficiaries of Kisan ICT project, 47.5 per cent were young, 32.5 per cent middle and only 20 per cent old. Further, in Warna wired project, she found 62.5 per cent young, 35 per cent middle aged and only 2.5 per cent old respondents.

Dhaka and Chayal (2010) in their research study on farmer's experience with ICTs on transfer of technology in changing Agri-rural environment found that majority (46.67%) of the respondents belonged to middle age group followed by young (38.67%) and old age (14.67%) group. Majority (50.67%) of the respondents were functionally literate (upto middle class) followed by high school (42.67%) and graduate and above (6.67%).

Chauhan (2010) studied expectations of the farmers from ICT in agriculture reported that sixty per cent of the internet facility expecting farmers of Anand district in Gujarat belonged to the small category of farmers with mixed farming as main occupation.

Narula and Arora (2010) on his study on prioritization of information related needs of farmers reported that 82 per cent of agriculture farmers possessed mobiles followed by computers (5.15%) at home or at workplace whereas, 4.8 per cent owned both computers and mobile phones with only 3.2 per cent of the farmers subscribed to the Internet.

Singh *et al.* (2010) in their study on sustainable models of information technology for agriculture and rural development observed that maximum (31%) of respondents were educated upto primary followed by 17.00, 14.50, 12.00, 2.50 per cent respondents were having education upto high school, intermediate, graduation and above graduation, respectively and only 23.00 per cent respondents were found illiterate.

Shankaraiah (2011) studied attitude of farmers and scientists towards technologies dissemination through Mobile Message Service (MMS) at Bangalore in Karnataka and found that majority of the farmers (52.50%) had middle age, majority of farmers (52.50%) were under medium education level followed by high (27.50%) and low (20.00%) education level. Majority of the farmers (90%) were big farmers followed by small farmers (10%).

Meena *et al.* (2011) conducted study on role of perception about ICT among farmers and found that 47.14 per cent farmers had primary education followed by college education (25.41%), middle school (24.29%), secondary education (9.28%) and illiterates (7.80%), respectively.

Basunathe (2011) conducted a study on performance and prospects of Information and Communication Technology (ICT) in livestock development in rural India and reported that majority of the users (55.33%) were found in middle age category. Regarding gender, 94 per cent were male and 6 per cent were female, more than 70 per cent of the respondents had middle school education. Majority of the livestock information users (45.33%) were marginal farmers.

Rajula and Thiagarajan (2011) conducted a study on interactive multimedia instruction versus traditional programmes: Analysis of their effectiveness and perception and indicated that participants who used interactive multimedia instruction in agriculture were mostly literate with high school to graduate level (73.55%).

Yadav *et al*. (2011) studied utilization pattern of different sources and channels of agriculture information used by the Fenugreek Growers *and* found that Farmer Mobile Advisory (FMA) Service is an important tool for need-based

information delivery on mobile phone. The adoption of rural technologies by farmer's through Krishi Vigyan Kendra's (KVKs) is a big leap in this direction.

Bhattacharjee (2012) reported in study on mobiles for mobilizing agricultural extension in India that all respondents had mobiles, even though 50 per cent of the respondents owned a TV and 65 per cent a radio in their household.

Sandhu *et al.* (2013) in their study on analysis of Kisan Mobile Advisory Service (KMAS) in South Western Punjab found that majority of the respondents (56.7%) were young (30 years of age). Eighteen per cent of the farmers belonged to middle age category while one fourth (25.3%) were of more than 45 years of age. Majority (65.3%) of the respondents were of medium category having education between 10^{th} to secondary or having any diploma. About one fourth of the respondents (22.6%) had high educational level while 12.0 per cent were of low educational level.

Okoedo-Okojie and Omoregbee (2012) in a study on determinants of access and farmer's use of Information and Communication Technologies in Edo state, Nigeria revealed that majority of the farmers (59.07%) utilized GSM for agricultural information were full time farmers.

Etwire *et al.* (2013) studied on small holder farmer's adoption of technologies for adaptation to climate change in Northern Ghana and reported that gender was one of the causes influencing farmer's adoption of a climate related strategies introduced by research institutions. Targeting females, increasing access to agricultural extension services and generating more attentiveness about variations in temperatures are important in promoting the adoption of climate related technologies.

Ganesan *et al.* (2013) studied use of mobile multimedia agricultural advisory systems by Indian farmers and revealed that nearly 97 per cent were male participants. About 47 per cent of the respondents were middle aged whereas, 31.44 per cent had high school education (upto 10^{th} standards), 21 per cent had higher secondary education (upto 12^{th} standards) and 15.28 per cent were graduate. Only

5.24 per cent of the farmers did not have any formal education, majority of them was small (39.74 %) to medium (41.74%) land holding farmers.

Jaisridhar (2013) conducted study on impact of Kisan Call Centre on technological adoption among dairy farmers of Tamil Nadu and revealed that 74.67 per cent of the KCC beneficiaries belonged to middle age group ranging from 35-50 years, 78.67 per cent of the beneficiaries were males. More than 1/3rd (38.67%) of the beneficiaries were educated upto high school. About 46 per cent of the beneficiaries were practising dairying cum agriculture, while 42.67 per cent of the beneficiaries owned land upto 2.5 acres. Majority of the respondents (70.67%) were found possessing medium herd size ranging between 5-15 animals in their herd.

Pandey and Solanki (2013) conducted study on knowledge of farm families about Agricultural Technology Information Centre (ATIC) in Udham Singh Nagar district and reported that more than majority (40%) of respondents belonged to old age group (46-60 years), 34.73 per cent respondents were educated upto graduation level and more than 40 per cent of them had land holding of 5.1-10.0 acres. Regarding occupation agriculture was the main occupation of all the respondents. However, majority of them were also involved in some subsidiary occupation along with agriculture.

Agrawal *et al.* (2014) conducted study on correlation of technical knowledge of Kisan Mobile Sandesh beneficiaries in Jabalpur district: a case of mobile-based ICTs application and reported that majority (57.26%) of the KMAS beneficiaries belonged to the young age group and had education upto high school (47%). The main occupation was farming (70.08%), had medium size of land holding (50.42%). Majority of Kisan Mobile Sandesh beneficiaries (52.99%) had above 5 members in the family and belonged to medium annual income category (46.16%).

Asiedu-Darko (2014) conducted study on effects of gender, education and age on the adoption of agricultural technologies in Ashanti, Northern and Eastern regions of Ghana and reported that gender has no significant effect on the adoption of agricultural technologies.

Kanavi (2014) studied usefulness of Kisan Mobile Advisory Services (KMAS) by the farmers of Dharwad and Gadag districts of Karnataka and reported that majority (67.50%) of farmers belonged to middle age category followed by young (20.83%) and old (11.67%) age category. Regarding education, 30.83 per cent farmers had pre university education, followed by high school education (25%), graduates/post graduate education (24.17%), middle school education (13.33%), primary school education (5%) and Illiterates (1.67%). Majority (44.17%) of them belonged to semi medium category followed by small (18.33%), medium (14.17%), big (12.50%) and marginal (10.8%) farmer category.

Ajijola *et al.* (2015) in a study on socio economic effect on the use of information and communication technology among rural farming households in Afijio local government area, Oyo State, Nigeria revealed that 92.03 per cent of the respondent's major occupation was farming.

Gurjar *et al.* (2015) found during survey on farmer's response on Kisan Mobile Advisory: *A* critical evaluation and reported that mobile users with education upto college level had the higher awareness (34.68%) about KMA. Maximum number of respondents followed the recommendations of advisory upto 61.3 per cent by big farm size holding farmers and minimum 10.3 per cent by marginal farmers.

Patra *et al.* (2016) conducted a study on Kisan Mobile Advisory Service- An effective ICT tool for technology dissemination and revealed that most (44%) of the respondents belonged to young age group followed by medium (36%) and old (20%). Male respondents were more (about 90%) than the female respondents (10%). Majority of the respondents were graduates (30.66%) followed by matriculation and middle level (20%). Majority of the respondents had small land holding (50.67%) and 20 per cent belonged to the large farmer category.

Sidhu (2016) conducted study on opinion and utilization of mobile based agro-advisory services by farmers and he observed that majority of respondents (45 per cent of the farmers of KVK service provider and 52 per cent of the farmers of the IFFCO service provider) belonged to the middle age (35-48 years) category. Majority of them had matric or secondary education, had small and medium land holdings,

had joint type of family and majority of them had agriculture as their primary occupation.

Sandhu *et al.* (2013) conducted study on Kisan Mobile Advisory Service (KMAS) in South-Western Punjab and reported that majority of the respondents (56.7%) were young followed by middle age (18%) and old age (25.3%), most (65.3%) of them were educated between 10^{th} to high secondary or having any diploma. More than 2/3rd of the respondents (70.6%) were medium category farmers having land between 2 to 10 hectares. Agriculture was the major enterprise of 2/3rd of the respondents while 22 per cent were engaged in horticulture.

Koshy (2016) conducted study on agricultural information support service vis-à-vis Kisan Call Centre: A performance auditing reported that majority of the respondents fell under the middle age group (52%) followed by old age (29%) which were above 55 years. Seventy three per cent of the respondents were male. Forty nine per cent of the respondents were found to have graduate level education, 38 per cent of the respondent had high school level of education followed by higher secondary education (10%) and primary level education (3%). Forty five per cent of the respondents were involved in farming and other occupations. Forty four per cent of the respondent's major source of income was farming and eleven per cent of the respondents were involved in farming as well as government jobs.

2.1.2. Information and communication pattern:

2.1.2.1. Source of information:

Nirmal (2003) in his study on dissemination of farm information through mass media, found that 42.09 per cent of the media users preferred radio for both agriculture and other purpose but only 11.20 per cent media users preferred radio for other than agriculture purpose alone.

Purushothaman and Kumar (2004) in their study on Telephone – an effective extension tool in hills found that the farmers help line service received 57 telephonic calls on 30 days at decided time from farmers of different places on various aspects after giving advertisement frequently in two newspapers in month of August and September, 2001.

Lavanya (2006) in her evaluation study of KCC in Tamil Nadu reported that there 23.3 per cent of the respondents were about KCC. Agriculture magazines were the main source through which 29.79 per cent of the users were aware of the KCC.

Frempong *et al.* (2006) in their research study revealed that more than two third of the respondents utilized telephone, television, radio and video decks for getting information on problems related to agriculture and allied subjects.

Thomas (2006) reported in his survey on information development in rural area of Andhra Pradesh and Kerala that 13 per cent of the farmer's accessed information on animal husbandry through radio, 1 per cent through input dealer, 16-17 per cent through progressive farmers and 37 per cent through other sources.

Sadaqath and Mariswamy (2007) conducted a study on analysis of usefulness and credibility of radio as perceived by literate farmers and reported that the majority of the farmers (70.50%) perceived radio as useful to a medium extent, 16 per cent of the farmers perceived it as less useful while the rest 13.50 per cent perceived it as more useful.

Meera (2008) in her study on Information and Communication Technology in agricultural extension reported that extent of utilization of different sources by farmers includes personal localite sources, i.e. friends (61.68%), neighbours (47.5%), relatives (35.83%). Personal cosmopolite sources like panchayat (13.33%), extension officer (23.34%) and veterinary officer (56.67%). Mass media sources were television (8.34%), radio (1.6%) and newspaper (10%).

Lavanya *et al.* (2009) studied needs and expectations of the farmers with the services of Kisan Call Centre and revealed that university scientists were the major source of information (70.00%) for awareness of KCC. More than half (60.00%) of the respondents expressed the credibility of scientists as the major reason for contacting KCC.

Slathia *et al.* (2011) studied on awareness among farming community regarding Kisan Call Centres in Jammu region and reported that seventy six per cent of the farmers had no knowledge of the centres as well as the toll free number. Twenty four per cent of the respondents, farm youth had high level of awareness

whereas, farm women dawdled behind in terms of the awareness regarding Kisan Call Centres.

Jaisridhar (2013) conducted study on impact of Kisan Call Centre on technological adoption among dairy farmers of Tamil Nadu and revealed that friends were the main localite sources followed by cosmopolite channel like mela, newspaper and television.

Koshy (2016) conducted study on agricultural information support service vis-à-vis Kisan Call Centre: A performance auditing and revealed that thirty per cent of the respondents reported their source of awareness of KCC was television, 16 per cent through radio and television, 10 per cent through radio and 7 per cent through television and newspaper.

2.1.2.2. Information sharing behaviour:

Jaisridhar (2013) conducted study on impact of Kisan Call Centre (KCC) on technological adoption among dairy farmers of Tamil Nadu and revealed that majority (51.33 %) of the respondents had shared information about existence of KCC upto 5 persons. Results pertaining sharing of suggested expert advices to others showed that to 44.67 per cent of the respondents shared the advices recommended by KCC upto 5 persons followed by 40.67 per cent of the respondents those shared information between 5 to 10 persons in their locality.

2.1.2.3. Frequency of contact:

Senthil kumar (2003) studied field testing cyber extension techniques for transfer of farm technology and reported that less than one-fourth (17.77%) of the respondents accessed for farm information two to five times and a least per cent of respondents (13.33%) accessed through mobile phone more than five times for farm information.

Selvarani (2005) in his survey on functioning of Kisan Call Centre- An analysis reported that nearly half (46.67%) of the respondents made less than five telephonic calls to KCC to clarify their doubts. A little less than one-third of the respondents (30.00%) made 5-10 telephonic calls to resolve their query.

Savithramma (2011) conducted study on farmers awareness of Kisan Call Centre and the symbolic adoption of advices in Karnataka and revealed that 72.50 per cent of the farmers had utilized the service only once in four month, 18.30 per cent of the farmers had utilized call centre 2-3 times and only 9.20 per cent of the farmers had made more than three telephonic calls to the KCC.

Koshy (2016) in her study on agricultural information support service vis-à-vis Kisan Call Centre: A performance auditing revealed that majority of the respondents (52%) had utilized the service more than six times while thirty per cent of the respondents utilized the service less than three times and 18 per cent of the respondents had utilized the service three to six times.

2.2. Categorization of the different queries:

2.2.1. Month wise distribution of queries:

Durga (2004) reported in her study on farmers help line- A new dimension that Hyderabad KCC received 3770 telephonic calls during the period of January to June 2005.

Selvarani (2005) studied functioning of Kisan Call Centre located at Agricultural Technology Information Centre (ATIC), Tamil Nadu Agricultural University and reported that less than one-fifth of the telephonic calls were made during February followed by slightly more than one-tenth of the telephonic calls were made during October and September.

India microfinance report (June 2011) reported that In 2010-11, over 20 lakh telephonic calls were received by the Kisan Call Centres as compared to 9 lakh telephonic calls in the previous year. Since its inception in 2004, KCCs have received more than 62 lakh telephonic calls.

Savithramma (2011) in her study on farmer's awareness of Kisan Call Centre (KCC) and the symbolic adoption of advice in Karnataka - A Study reported that maximum number of telephonic calls were made in the month of August (15.46%), followed by September (12.60%). The least number of telephonic calls were made in the month of April (3.17%) and May (2.75 %).

Koshy (2016) in her study on agricultural information support service vis-à-vis Kisan Call Centre: A performance auditing reported that Karnataka and Kerala received maximum number of telephonic calls during the month of November and least during the month of May. Tamil Nadu received maximum number of average telephonic calls during the month of January and least during the month of September.

2.2.2. Query wise distribution of telephonic calls:

Purushothaman and Kumar (2004) conducted study on telephone–An effective extension tool in hills and found that nearly 26.00 per cent of the farmers were intended to know about crop diseases, 25.00 per cent about crop varieties, 12 per cent about insect of crops and 11.00 per cent about seed availability and around 26 per cent of the farmers had problems related to animal husbandry and veterinary aspects.

Sharma and Rao (2005) in their study on bridging the digital divide: Information kiosk in rural India-Challenges and opportunities reported that majority of the queries asked by farmers were on market prices of agricultural commodities (60%), weather information (13%), cropping and soil testing practices (8%) etc.

Sowmyashree (2007) reported in study on critical analysis on the functioning of Kisan Call Centres in Karnataka that highest numbers of telephonic calls made were related to plant protection followed by soil and nutrition.

Kant and Pandey (2011) studied the impact analysis of KCC of MP in 5 years (2006-2010) and reported that maximum telephonic calls received in discipline of plant protection (50.47%) followed by agronomy (25.93%) and minimum telephonic calls received in the discipline of agro-forestry (0.07%) followed by soil science (01.51%).

Savithramma (2011) in her study on farmer's awareness of Kisan Call Centre (KCC) and the symbolic adoption of advice in Karnataka - A study reported that maximum numbers of telephonic calls attended by Kisan Call Centre were related to diseases control (23.77%) followed by varieties and hybrids (14.46%), pests control

(12.52%). However, the least telephonic calls were related to azolla cultivation (0.14 %) and fodder crops (0.11%).

According to a report by TCIL (2012), Tamil Nadu KCC received 787650 total telephonic calls during the period of May 2010 to April 2011, out of which 538797 telephonic calls were related to agriculture queries, 1,35,594 were related to horticulture and 1,13,259 telephonic calls were related to animal husbandry queries.

Sandhu *et al.* (2013) in their study on analysis of kisan mobile advisory service in South Western Punjab found that maximum (29.8%) SMS were sent in the field of agronomy, followed by plant protection (17.3%). Similarly information related to soil science, animal science, horticulture, weather related information and information pertaining to training programmes were sent to farmers.

Shankaraiah (2011) in his study on attitude of farmers and scientists towards technologies dissemination trough mobile message service found that technologies like crop production (50%), crop management (52.50%) and marketing (80%) were more relevant technologies disseminated through MMS Network whereas, technologies like input management (55%), crop protection (50%), soil and water management (65%) and harvest and post-harvest (70%) are relevant technologies disseminated through MMS network.

Jaisridhar (2013) conducted study on impact of Kisan Call Centre (KCC) on technological adoption among dairy farmers of Tamil Nadu and revealed that majority of beneficiaries utilized information on the aspect of livestock feeding followed by fodder production and management.

Ganesan *et al.* (2013) conducted study on use of mobile multimedia agricultural advisory systems by farmers of Erode and Dharmapuri districts of Tamil Naidu and reported that nearly 32 per cent of farmers used mobile multimedia agricultural advisory system frequently, majority of farmers (90.83%) perceived information on early warning systems about outbreaks of disease and pest infestation and information on how to manage such outbreaks as most appropriate. The information on animal husbandry and dairy was highly required by majority (54.15%) of farmers and observed as most relevant to their need.

Kanavi (2014) conducted study on an analysis of Kisan Mobile Advisory Service (KMAS) of Krishi Vigyan Kendra (KVK) and reported that highest number of messages were sent in the area of plant protection followed by pest management, disease management, nutrient management, weed management, nursery preparation, vegetable, food and nutrition, dairy, seed treatment, soil management and extension activities, water management, floriculture, poultry, sheep and goat management.

Patra *et al*. (2016) found that the majority of the farmers stated time specific advisories were most important followed by weather forecasting and marketing information. The messages on agronomic practices were most suitable followed by management of disease & pests.

Koshy (2016) in her study on agricultural information support service vis-à-vis Kisan Call Centre: A performance auditing reported that maximum telephonic calls were registered on agriculture related queries (87.50%) followed by veterinary (4%), fisheries (1.47%), dairy (1.02%), engineering (1.02%) and irrelevant queries (5%).

Lahiri *et al.* (2017) conducted study on mobile phone use efficiency of Garo tribal farmers in North- Eastern Himalayan region of India observed that the information on the weather forecast (30.24%) is mostly needed by the farmers followed by information on the price of agricultural inputs (23.90%) and information on marketing facilities (7.80%).

2.2.3. District wise distribution of queries:

Selvarani (2005) studied functioning of Kisan Call Centre and reported that 825 telephonic calls were made during 2004 to KCC level second located at Agricultural Technology Information Centre (ATIC), Tamil Nadu Agricultural University and more than one-tenth of the enquiries were made from Coimbatore district followed by a little less than one-tenth of the queries from Erode district whereas, minimum number of enquiries (0.24%) were made from Nilgiri district.

Sowmyashree (2007) in her study on content analysis of Kisan Call Centres in Karnataka reported that maximum numbers of telephonic calls were made by farmers of Shimoga district and minimum from Kodagu district during 2006.

Savithramma (2011) in her study on farmer's awareness of Kisan Call Centre (KCC) and the symbolic adoption of advice in Karnataka - A study reported that farmers asked maximum number of queries from Hassan district (2509) followed by Belgaum (2230), Tumkur (2055) and Kolar (1949) districts.

Koshy (2016) in her study on agricultural information support service vis-à-vis Kisan Call Centre: A performance auditing reported that Kerala KCC received majority of telephonic calls from Malappuram, Palghat, Thrissur, Ernakulam and Trivandrum districts.

2.3. Adoption and level of satisfaction:

2.3.1. Adoption:

Lavanya (2006) reported in formative evaluation of Kisan Call Centre in Tamil Nadu that majority of the respondents (80%) adopted the agriculture related recommendations like pest and disease control of the crops received through KCC whereas, more than three-fourth of the users of KCC not adopted the advice given by experts.

Kumar *et al.* (2012) on their study on assessment and refinement of KMA in Tikamgarh district (Madhya Pradesh) reported that Kisan Mobile Advisory (KMA) service users fully adopted the recommended advice in the field of plant protection, crop production and live stock production and management whereas, low adoption was in the field of pomology, resource conservation and soil fertility management.

Koshy (2016) in her study on agricultural information support service vis-à-vis Kisan Call Centre: a performance auditing revealed that forty six per cent of the respondents partially adopted the practices recommended by the call centre agents, 43 per cent of the respondents adopted the practice completely, 6 per cent of the respondents did not act on the advices, 4 per cent of the respondents contacted the extension worker for more details and 1 per cent of the respondents discussed the advice with the neighbour.

2.3.2. Satisfaction:

Sharma and Rao (2005) in their study on bridging the digital divide: Information kiosk in rural India-Challenges and opportunities reported that most of the farmers (81%) were satisfied with the answer provided by village knowledge centre.

Selvarani (2005) studied functioning of Kisan Call Centre-An analysis and reported that majority (86.67%) of the respondents expressed that the scientists of KCC were friendly in answering the call. All of the respondents revealed that the recommendations offered through KCC were accurate. More than one third (40.00%) of the respondents expressed that instant solutions to the agricultural problems are offered through KCCs.

Lavanya (2006) studied needs and expectations of the farmers with the services of Kisan Call Centre and reported that more than half of the users were not satisfied with the overall services of KCC.

Hanumankar (2011) in his study on application of ICT in agricultural extension: An evaluation study of Kisan Call Centres (KCCs) reported that 84 per cent of the farmers expressed overall satisfaction from the advice provided through the helpline on the basis of the supply side factors like promptness of response, patient hearing and completeness of answer, farmers who received a complete response were 78 per cent more satisfied than those who did not receive a complete response. There was also evidence of farmers satisfaction growing with repeat telephonic calls made by them to the KCCs. Analysis of satisfied farmers by the demographic profile suggests that younger farmers below 38 years of age with post matriculate academic background and less than 10 years of farming experience expressed the highest level of satisfaction.

Savithramma (2011) in her study on farmer's awareness of Kisan Call Centre and the symbolic adoption of advice in Karnataka reported that nearly 95 per cent of farmers adopted the advice symbolically and only 5 per cent of the farmers did not. He also reported regarding satisfaction that nearly half (47.50%) of the respondents are moderately satisfied, followed by least (27.50%) and highly satisfied (25%). Highest level of satisfaction (85.28%) was towards KCC personnel accessibility whenever, the farmers seek their help followed by timely provided information

(81.67%) and relevant information provided by KCC. The least satisfaction was towards KCC personnel given information on subsidy (52.22%) and information given on different schemes (51.94%).

Bhattacharjee (2012) conducted a study to understand the utility of the mobile based agro-advisory services in an underprivileged area like the state of Meghalaya in North-East India. It was found that the response in terms of satisfactory level with the service and its utility was not very encouraging.

Bhaskar (2013) reported in impact study of the SMS service of Farm Science Centre (FSC) in Babhaleshwar that 70 per cent of the farmers reported the service was excellent and the rest 30 per cent reported it was very good.

Jaisridhar (2013) conducted study on impact of Kisan Call Centre on technological adoption among dairy farmers of Tamil Nadu and reported that little above half (54.09%) of the respondents expressed their satisfaction towards the provision of information and expert's advice from KCC. Around 50 per cent of the respondents voiced their satisfaction towards KCC for helping them to plan and make decisions on dairying. About 62.67 per cent of the respondents said, KCC is unique when compared to the routine extension advisory systems in agriculture and allied services. Majority (71.33%) of the respondents were satisfied with the existing infrastructure that meets the needs of the farming community. As far as provision of new opportunity to build skills and knowledge upon scientific dairy farming practices 56.00 per cent of the respondents expressed their dissatisfaction towards KCC. More than half (62.67%) of the users were having medium level of gratification towards the overall services of KCC. Only 28.67 per cent of the respondents were found under high level of gratification towards KCC.

Kanavi (2014) studied usefulness of Kisan Mobile Advisory Services (KMAS) by the farmers of Dharwad and Gadag districts of Karnataka and reported that KMAS were moderately useful (48.33%) to farmers followed by most useful (26.67%) and less useful (25.00%). Majority of the respondents belonged to medium and high usefulness because subject areas covered in KMAS are most relevant to them and with good educational background of the farmers they are very much interested in the new technologies disseminated through KMAS.

Singh *et al.* (2015) conducted study on impact assessment of mobile based agro-advisory of tribal farmers of Ri-Bhoi district of Meghalaya and found that most of the farmers (82.10%) were satisfied with the information provided by the m4agriNEI team on pest and disease management on ginger.

Sidhu (2016) conducted study on opinion and utilization of mobile based agro advisory services by farmers and reported that 46.00 per cent respondents were somewhat satisfied, 32 per cent were highly satisfied and 22 per cent of the respondents were not satisfied with information related to animal health check up provided by IFFCO mobile based agro service. Slightly more than half of the respondents (51%) were somewhat satisfied whereas, 36 per cent were not satisfied and only 13 per cent were highly satisfied with the information regarding about animal vaccination.

2.4. Association between selected independent variables with dependent variables:

Meera (2008) found in her study on ICTs in agricultural extension-tactical to practical conducted in India that variables like education, training received, faith in people and orientation towards ICT were found to have significant relation with ICT use. Age had negative relationship with ICT use. Land holding has got non-significant correlation with ICT used.

Savithramma (2011) in her study on farmer's awareness of Kisan Call Centre (KCC) and the symbolic adoption of advice in Karnataka revealed that education, annual income, mass media participation, access to telephone/mobile and cosmopoliteness had positive and significant relationship at 0.01 level with awareness of respondents about KCC and social participation had positive and significant relationship at 0.05 level with awareness. The variable symbolic adoption of farmers was positively significant and related with education, annual income, mass media participation, cosmopoliteness and access to telephone at 1 per cent level.

Agrawal *et al.* (2014) studied impact of Kisan Mobile Sandesh (KMS) in dissemination of agricultural information in Jabalpur district of Madhya Pradesh and

reported that age and education of the beneficiaries had significant and positive relationship with their adoption of recommended practices.

Singha and Baruah (2012) studied adoption behaviour of dairy innovations by small farmers under different farming systems in Assam and reported that education, extension contact, annual income, operational land holding, innovation proneness and decision making ability of respondents had positive and significant relationship with their extent of improved dairy farming practices under the selected farming system.

Devi (2013) reported in her study on adoption of dairy farming technologies by livestock farmers that majority of the livestock farmers had medium level of adoption behaviour with respect to dairy farming technologies. Information input and output, farmer infra system communication, farmer researcher communication, farmer extension agent communication, availability of input facilities and overall knowledge level about dairy farming technologies had positive and highly significant relationship with overall adoption of dairy farming technologies by livestock owners.

Kanavi (2014) studied usefulness of Kisan Mobile Advisory Services (KMAS) by the farmers of Dharwad and Gadag districts of Karnataka and reported that variables such as age, education, mass media utilization, extension contacts, source of information, cosmopoliteness had positive and significant relationship with usefulness of KMAS. Farm size and annual income had no significant relationship with usefulness of KMAS. While variables such as age, education, cropping pattern, decision making ability, extension contacts, economic motivation, innovative proneness and achievement motivation had positive and significant relationship with utility of KMAS. Farm size, annual income, mass media utilization and cosmopoliteness had no significant relationship with utility of KMAS.

2.5. Constraints perceived and suggestions elicited by respondents:

2.5.1. Constraints perceived by the respondents:

Akpabio *et al.* (2007) quoted that poor infrastructure, high cost, lack in skill and dissemination of inappropriate information to farmers, including language barriers are constraints related to ICT in developing countries.

Singh (2009) conducted study on e-Agriculture and e-Governance in India: Agriculture knowledge communication with application of Information Communication Technologies (ICT) and reported that unawareness about helpline number, low use of existing services and low adoption of recommendation through helpline services were major constraints perceived by respondents.

Dhaka and Chayal (2010) reported that the poor knowledge of facilitator about subject matter and inadequate infrastructure facility like power supply and internet facility in rural area were major constraints perceived by respondent farmers in make best use of ICT services.

Masuki *et al.* (2010) in his study on role of mobile phones in improving communication and information delivery for agricultural development- Lessons from South Western Uganda reported that the local language, illiteracy, poor signals, high cost and unavailability of electric power were the major constraints faced by the farmers of Rubaya sub-county in Kabale district of South-Western Uganda.

Falola and Adewumi (2011) conducted a study on constraints to use of mobile telephony for agricultural production in Ondo state, Nigeria concluded that non-membership of agricultural society, inadequate extension services, fluctuating telecommunication services, inadequate access to mobile services and lack of electric power supply were the major constraints to the use of mobile telephone services by the farmers.

Savithramma (2011) in her study on farmer's awareness of Kisan Call Centre and the symbolic adoption of advice in Karnataka reported that about more than half (55.83%) of the respondents faced problem with line busy, followed by not receiving call in early morning (29.17%), no clarity in delivery of information (9.17%) and delivery of message in high speed (3.33%).

Shankaraiah (2011) in his study on attitude of farmers and scientists towards technologies dissemination through Mobile Message Service (MMS) reported that among all the constraints faced by farmers to use MMS network, clarification is difficult if any doubt arises (Rank I), lack of practical exposure (Rank II), lack of locally relevant information (Rank III) were the major constraints whereas, network availability (Rank IV), cost involvement is more (Rank V), human element is missing (Rank VI), electricity problems (Rank VII), health problems (Rank VIII) and fear to adopt technology (Rank IX) were the least constraints faced by the farmers to use MMS network.

Adhiguru and Devi (2012) conducted a study on 40 farmers from each initiative i.e."Helpline" in Kanpur district of U.P. and "I-Kisan" in Kanchipuram district of Tamil Nadu and reported that inadequate phone/internet connectivity, unavailability of facilitator, inadequate subject matter were major constraints faced by the farmers during use of service.

Agrawal *et al.* (2014) studied on impact of Kisan Mobile Sandesh (KMS) in dissemination of agricultural information in Jabalpur district of MP and reported that majority of KMS beneficiaries faced the problems related to network of cell phone followed by problem related to content of message, non-availability of KMS related literature, problem related to language, lack of information and technical guidance from extension functionaries, untimely delivery of message and lack of extension activities.

Chukwunonso *et al.* (2012) conducted a study on the adoption of Information and Communication Technology (ICT) in agriculture in Adamawa state, Nigeria and reported that out of 40 farmers, 15 farmers (37.5%) told that lack of knowledge, 9 farmers (22.5%) said lack of access to ICT and 10 (25%) said high cost of ICT were major constraints in the use of ICT in agriculture.

Mittal and Mehar (2013) studied the rising spread of mobile telephony in almost all states of the IGP (Indo-Gangetic Plains) and revealed that most of the respondents had language problem. They wanted the service to be in local language and the service needed to explore in the remote areas.

Ganesan *et al.* (2013) conducted study on use of mobile multimedia agricultural advisory systems by Indian farmers and revealed that inadequacy of the call centre agricultural expert's knowledge, lower quality information, irrelevant and unreliable information, limited technological skills in operating mobile phone and inadequate mobile phone connectivity in rural areas were major constraints faced by the farmers in making the best use of mobile based multimedia agricultural advisory system.

Kumar *et al.* (2014) conducted study on the impact of Kisan Mobile Advisory Services in transfer of agriculture technology by KVK in Harda district of MP in year 2013-14 and concluded that message was needful and timely for 82 per cent farmers, 15 per cent reported that message was needful but not timely for them and 3 per cent found that the advisory was not needful and timely. They also reported that advisory messages were medium understandable (49%) and 2 per cent farmers reported that message was not understandable for them.

Jaisridhar (2013) conducted study on impact of Kisan Call Centre on technological adoption among dairy farmers of Tamil Nadu and revealed that farmers could not access the number 1551 through mobile phone, information on animal husbandry and loans are not provided at level-I, difficulty in getting line to KCC, the telephone number of level–II, specialists are given instead of escalating the telephonic calls, absence of SMS during call escalation in level-II, lack of awareness about KCC in many of the villages, time taken to get the required information is more, no proper response even after repeated enquiries and difficulty in explaining the health symptom of the animal through phone were major constraints faced by dairy farmers.

Kanavi (2014) studied usefulness of Kisan Mobile Advisory Services (KMAS) by the farmers of Dharwad and Gadag districts of Karnataka and reported that majority (90%) of farmers reported clarification of the message was difficult, followed by difficult to understanding of technical words (72.50%), lack of practical exposure regarding the technology sent by the KMAS (68.33%), risk in adoption of KMAS messages (50%) were the major constraints faced by the farmers. Irrelevant information (20%), poor network connectivity (20%), KMAS SMS were not timely

(15%), irregular charging of mobiles due to electricity problems (8.33%) and difficult to operate mobiles (4.17%) were other constraints faced by the farmers.

Singh *et al.* (2015) in their study on constraints faced in mobile based agro-advisory services and strategy for enhancing the effectiveness of M-Krishi reported that lack of updated information**,** high cost for service, low literacy, poor connectivity of network, lack of skill to use modern it gadgets, lack of self confidence in handling mobile based information system and high cost for establishment are major constraints faced by users.

Pal (2016) in his study on impact of mobile phone services on management of onion crop in some villages of Jhotwara block of Jaipur (Rajasthan) found that fluctuating telecommunication network, non availability of KCC services on sunday and holidays, inability to use GPRS and 3G services, inability to understand language of service provider, inability to purchase recharge cards, high cost of telecommunication network services, lack of satisfactory solution of individual problem and lack of contact details (number) of agricultural advisory system were major constraints perceived by farmers.

Koshy (2016) in her study on agricultural information support service vis-à-vis Kisan Call Centre: A performance auditing reported that lack of connectivity (64%), inability to comprehend the advice from the call centre agents (49%), lack of infrastructure (44%), illiteracy (42%), lack of awareness about ICT tools (42%), negative mentality in accepting new things (41%), lack of proper training (40%), not compatible with culture (38%) and lack of telephones /mobile phones (36%) were the major constraints faced by the respondent in using the KCC service.

2.5.2. Suggestions elicited by respondents:

Savithramma (2011) in her study on farmer's awareness of Kisan Call Centre and the symbolic adoption of advice in Karnataka reported that majority (34.16%) of respondents suggested to provide more information related to pest and disease problems followed by detailed information for their queries (19.17%) whereas, 10 per cent and 8.33 per cent of respondents suggested KCC should provide information on latest technologies and schemes, respectively.

Kumar *et al.* (2012) reported that the Kisan Mobile Advisory (KMA) service had been refined on the basis of suggestions made by the respondents during the assessment of KMA in 2008-09. Nearly 85 per cent of farmers reported language of advisory should be in hindi instead of roman.

Singh *et al.* (2015) on his study on constraints faced in mobile based agro-advisory services and strategy for enhancing the effectiveness of m-KRISHI revealed that farmers suggested to give training to extension officers as well as the officials in agricultural department and other line departments to promote KRISHI, training to farmers about how to utilize the information available in mobile, suggested to provide location specific and problem specific information, more linkage of m-KRISHI centre with State Agricultural Universities (SAUs), Krishi Vigyan Kendra's, ICAR Institutes, State Department of Agriculture and other development departments, prompt reply to the queries and information asked by the farmers etc.

Pal (2016) revealed in his study about farmers suggestions that the information should be provided in convenient form to understand and use, provided information should be useful, complete and appropriate that can solve the problem of farmers, service providers should develop the confidence and faith into the farming communities towards use of mobile phone services in agriculture and motivate them to use mobile phone services through result demonstration, exhibition, group meetings and different awareness programmes. Information should be provided in time that will be help full for farmers.

Patra *et al.* (2016) in their study Kisan Mobile Advisory Service (KMAS)- An effective tool for technology dissemination revealed about farmers suggestions that the message should be simple and understandable, should be served in local language, should have practical applicability, voice message facility should be provided.

Sidhu (2016) conducted study on opinion and utilization of mobile based agro advisory services by farmers and reported regarding suggestions from respondents to improve KVK mobile based agro-advisory services that 36 per cent of the respondents suggested to provide daily weather updates, 25 per cent suggested to provide vast information about preventive measures, insect–pest attack and

diseases, 21 per suggested to send messages in local language, 20 per cent suggested not to repeat messages and 15 per cent suggested to provide information on government schemes and subsidies. Nine per cent suggested that upto date information on agriculture and allied sector should be given followed by 7 per cent suggested that the information on animal husbandry should also be provided whereas, IFFCO mobile based agro-advisory service users suggested that daily weather information should be given (14%), timing of messages and voice telephonic calls should be fixed (11%), information regarding government policies, farm management and more number of voice call needed (8%), language should be compatible with phone (6%) and up-to-date information regarding weather, agriculture, animal husbandry and other aspects should be needed (5%).

Koshy (2016) in her study on agricultural information support service vis-à-vis Kisan Call Centre reported about farmer's suggestion to improve the services of KCC that call back facility (83%), transfer telephonic calls to level-II of KCC through call conferencing (77%), advice on organic ways of fighting pest and diseases (75%), provide information of shops where the suggested inputs are available in the respective area/place (70%), to provide services in each district by opening offices of KCC (70%), to provide quickest, easiest and practical solutions (65%), to continue the messages through mobile phones (63%). Other suggestions were to provide information in elaborate and slow manner without rushing, to suggest solution based on the respective area and to provide service from the most knowledgeable person.

3. RESEARCH METHODOLOGY

Research methodology is the systematic exploration into the study of methods and tools used in order to establish facts and tangible conclusions. It deals with research methods and techniques used in the study. It mainly describes the procedure followed in the selection of locale, district and respondents. Besides description of locale, variables and their measurement procedure, methods of data collection and use of statistical tools were also outlined. Research methodology adopted for conducting research is discussed under the following sub-headings:

3.1 Sampling Procedure

3.1.1 Locale of the study

3.1.2 Selection of districts

3.1.3 Selection of respondents

3.2 Variables and their measurements

3.3 Methods of data collection

3.4 Statistical tools and methods use for data analysis

3.1 Sampling procedure:

Study was carried out in state Rajasthan. Random sampling method was used in selection of respondents. Two districts, Bikaner and Jaipur were purposively selected having maximum recorded telephonic calls at RTHS during the period of six months (1 January-2017 to 30 June-2017)**.** Total 75 respondents from each district were selected to make total sample size of 150**.**

3.1.1 Locale of the Study:

The study was carried out in state Rajasthan.

3.1.1.1. Background information about Rajasthan

Demographically, Rajasthan is one of the largest state of the country, spread over an area of 3.42 lakh sq. km, representing about 10.43 per cent of the total land area of the country. It is located in the North-Western part of the subcontinent and is

situated between 23^{o}3'N and 30^{o}12' North latitude and 69^{o}30' and 73^{o}17' East longitudes. About 57.5 per cent area of the state covers the great Indian Thar desert. The arid zone in India covers about 13.93 per cent of the country's geographical area (3.2 lakh sq. km) of which 90.09 per cent lies in the North-Western part of the country including Rajasthan.

It is bounded on the West and North-West by Pakistan, on the North and North-East by the states of Punjab, Haryana, and Uttar Pradesh, on the East and South-East by the states of Uttar Pradesh and Madhya Pradesh and on the South-West by the state of Gujarat. The agro climatic nature of the state does not offer promising prospects for agricultural operations due to uncertainty in intensity and spread of rains and extreme geo-climatic conditions.

For the administrative point of view Rajasthan state has been divided into seven divisions i.e. Ajmer, Bharatpur, Bikaner, Jaipur, Jodhpur, Kota and Udaipur. The economy of Rajasthan is basically depends on agriculture and livestock. The total cultivated area of the state is 205.00 lakh hectares, out of which 163.65 lakh hectares is non-irrigated and 41.35 lakh hectares is irrigated. The main crops grown as the state are bajra, maize, gram, wheat, cotton, oilseeds, pulses and tobacco etc. The state harbours fabulous livestock including milch and draft cattle viz., Rathi, Tharparkar, Mewati, Nagori, Sahiwal, Gir, Kankrej and buffaloes viz., Surti and Murrah. Quality wool producing sheep breed viz. Malpura, Magra, Chokla, Nali, Pugal, Sonadi, Marwari and Jaisalmari. Meat and milk producing goat breeds viz. Barbari, Marwari, Sirohi and Jhakrana and camel breeds includes Bikaneri, Jaisalmeri, Jalori, Mewari and Marwari.

The total livestock population of Rajasthan is 577.32 lakh, comprises about 133.24 lakh cattle, 129.76 lakh buffaloes, 90.79 lakh sheep, 216.65 lakh goats, 2.37 lakh pigs, 37.78 thousand horses and ponies, 81.47 thousand donkeys and 3.25 lakh camels. The total poultry population is 80.24 lakh. Livestock density of state is 169 (Anonymous, 2012).

Animal Husbandry in Rajasthan is a major economic activity contributing approximately 9-10 per cent of the total net domestic income. The state possesses

6.06 per cent of cattle and 11.20 per cent buffalo of the country. The state produces approximately 8.05 million tonnes of milk per year, which is approximately 10 per cent of total milk production in the country and produces 30 per cent of mutton and 35 per cent wool of country (Anonymous, 2012). The existing infrastructure facilities of state animal husbandry department include a total of 2527 veterinary hospitals, 2917 veterinary sub centres and 198 veterinary dispensaries in the state (Anonymous, 2016).

3.1.2 Selection of districts

For research purpose, two districts, Bikaner and Jaipur were selected from state Rajasthan, having maximum recorded telephonic calls during the period of six months (1 January 2017 to 30 June 2017)**.** Total recorded phone calls were collected from the record of IUMS (Integrated University Management System), RAJUVAS, Bikaner in form of respondent's queries during last six months.

3.1.2.1 Profile of Bikaner district

The Bikaner district is situated 320 kms away from Jaipur, the state Capital. It is situated in North-Western part of Rajasthan between 27°11N and 29°03' North latitudes and 71°54' and 74°12' East longitudes. It is surrounded by Churu district on East, Jaisalmer district on the West, Srigananagar and Hanumangarh districts on North and Nagaur and Jodhpur on South. National Research Centre on Camel (NRCC) and National Research Centre on Equines (NRCE) are situated at Bikaner.

Total area of Bikaner district, is 27,244 sq. kms, comprising with a total of 3,23,000 hectares of agriculture land, out of which 1,21,676 hectares is irrigated and livestock density sq.km. is 102 (Anonymous, 2012).The major crops of district are bajra, jowar, moth and pulses like gram and mung. Sandy type of soil is found in this area. It is porous, light in weight and contains low quantity of major and minor elements with high pH. Due to low water holding capacity, fertility of soil is very low.

The climate of the district is totally dry. The mean daily minimum and maximum temperature is 23 and 45.6 degree centigrade, respectively. The overall average temperature is 27.7 ℃

The total population of Bikaner is 23, 63,937 with a population density of 78 sq.km and literacy of 65.13 per cent (Anonymous, 2012). Bikaner district consists of 8 tehsils viz: Bikaner, Kolayat, Khajuwala, Chhatargarh, Pugal, Nokha, Lunkaransar and Sridungargarh There are 918 villages and 220 Gram panchayats. There is one Municipal Corporation (Bikaner) and six Municipal Councils: - Deshnok, Nokha, Dungargarh, Khajuwala, Loonkaransar and Napasar.

The exotic cattle population is 57421 and Indigenous cattle population is 848654. The total cattle population is 906075 and buffallo population is 193433. Sheep population is 653028, goat population is 961907, horses and ponnies population is 3047, mules population is 45, donkeys population is 8712, camel population is 46209 and pig population is 859. Total poultry population is 2773315 (Anonymous, 2012). Bikaner district stands at first rank in cattle population (906075), fourth rank in goat population (961907) and third rank in camel population (46209).

3.1.2.2 Profile of Jaipur district:

Jaipur is situated in the Eastern part of Rajasthan, surrounded on three sides by the rugged Aravali hills. Jaipur is located at 26°55′N 75°49′E (26.92°N 75.82°E is 111.8 kms). Total area of district is 11,152 sq. kms and population is 3.073 million. It is surrounded by Alwar and Sikar in the North, Sikar, Nagaur, and Ajmer in West, Ajmer, Tonk, and Sawai Madhopur in the South and Dausa and Bharatpur districts in East. It has an average elevation of 430 metres (1414 ft). Rajasthan Livestock Development Board, Directorate of Animal Husbandry Department and PGIVER are also situated in Jaipur.

Jaipur has a semi-arid climate. Temperature varies in different seasons. There are however occasional cold waves that lead to temperatures near freezing. Major crops of Jaipur district are wheat, bajra, barley, ground nut, rapeseed, mustard, gram, maize, sugarcane and jowar.

Jaipur district ranks 1st in terms of population, 9th in terms of area and 1st in terms of population density in state. Jaipur district has thirteen tehsils. The literacy rate in Jaipur district is 75.5 per cent which is higher.

Exotic cattle population is 344908 and indigenous cattle population is 290033 which comprise total cattle population 634941. Buffalo population is 1073386, sheep population is 220048, goat population is 837094, horses and ponies population is 1175, mules population is 54, donkeys population is 1300, camel population is 4896, population is pigs population is 21203 and total livestock is 2803997. Total poultry population is 337705 (Anonymous, 2012).

3.1.3 Selection of the respondents

Primary data and secondary data:

Total recorded phone calls were collected from the record of IUMS (Integrate University Management System), RAJUVAS, Bikaner in form of respondent's queries during last six months (1 January-2017 to 30 June-2017) and treated as base of secondary data for further processing and analysis. Beside these, secondary data were also collected from available literature, reports, books, research findings etc. to support the research and thesis writing. Secondary data were further categorized on the basis of different criteria such as queries wise, state wise, zone wise, district wise, month wise and case wise.

From these collected phone calls, two districts were purposively identified based on the highest number of telephonic calls received by RTHS during the period of six months. From each district, total 75 respondents were randomly selected to make a total sample size of 150 respondents for collection of primary data for research purpose. Respondents were personally contacted through telephonic interview schedule to collect required data for further research which served as base for primary data.

3.2 Variables and their measurement

For the present study, following relevant variables were selected after reviewing available literature:

3.2.1. Variables and their measurements

S. No.	Independent variables	Measurements
1	**Socio-economic variables**	
1.1	Age	Through interview schedule
1.2	Sex	Through interview schedule
1.3	Education	Through interview schedule
1.4	Family size	Through interview schedule
1.5	Family Type	Through interview schedule
1.6	Type of House	Through interview schedule
1.7	Occupation	Through interview schedule
1.8	Land holding	Through interview schedule
1.9	Livestock holding	Through interview schedule
1.10	Accessibility to telephone and mobile	Through interview schedule
1.11	Number of mobile users in family	Through interview schedule
2	**Information and communication pattern**	
2.1	Source of information	Through interview schedule
2.2	Information sharing behaviour	Through interview schedule
2.3	Frequency of contact	Through interview schedule
3	**Dependent variables**	
3.1	Adoption of advices	Adoption index of Meena (1999) with suitable modifications
3.2	Satisfaction towards services	Satisfaction scale followed by Haque (1981) with suitable modifications
4	Categorization of queries/telephonic calls	Through secondary data and interview schedule
5	Constraints perceived by respondents	Procedure followed by Varghese (2000) with suitable modification
6	Suggestions elicited by respondents	Through interview schedule

3.2.2. Operational definitions of variables:

3.2.2.1 Age:

It refers to the chronological age of the respondents at the time of data collection. Completed age in years was collected and these were classified into three categories on the basis of equal class intervals i.e. young age (below 25 years),

middle age (25 to 50 years) and old age (above 50 years) and the scores were given 1, 2 and 3, respectively.

3.2.2.2. Sex:

Sex referred to gender to which the users of helpline service belonged. This was studied to analyze the extent of gender participation in availing the services offered by RTH. Sex was classified into 2 groups i.e. male and female and scores were 1 and 2, respectively.

3.2.2.3. Education:

It refers to the academic qualification of the respondents acquired through formal schooling. This variable was divided into five categories i.e. illiterates, primary, middle, high school or secondary, graduate and above and the scores were given as 1, 2, 3, 4 and 5, respectively.

Category	Score
Illiterate	1
Primary	2
Middle	3
Secondary / Higher Secondary	4
Graduate or Above	5

3.2.2.4. Family Size:

The family is a basic institution and is a system of organized relationship involving workable and dependable ways of meeting basic social needs. It refers to the total number of person living together under one roof at the time of investigation. The family size was grouped into three equal categories on the basis of minimum and maximum number of family members present in a family, as (i) Small ($\leq$ 4 members) (ii) Medium (5-8 members) and (iii) Large (> 8 members) and scoring was 1, 2 and 3, respectively.

3.2.2.5. Family type:

Respondents were asked to indicate in which type of family they live. Respondents were categorized into nuclear family and joint family and scores were given 1 and 2, respectively for their responses.

3.2.2.6. Type of house:

Respondents were asked to indicate their type of housing and it was classified into three group's katcha, pucca and mixed and scores were given 1, 2 and 3, respectively.

3.2.2.7. Family occupation:

Occupation refers to means through which a person earns livelihood for his family. Operationally, it was defined in terms of the farmer's source of earning. Respondents were asked to indicate their occupation and they were classified into 4 occupational categories and scoring procedure was as follows:

Category	Score
Animal Husbandry	1
Animal Husbandry + Agriculture	2
Animal Husbandry + Agriculture+ Labour	3
Animal Husbandry + Agriculture + Service (Private/Government)	4

3.2.2.8. Land holding:

It is the actual land owned by the family of livestock owners in hectares. According to NSSO, 2013 the respondents were grouped into 6 equal categories i.e. landless (no land), marginal (<1 ha), small (1-2 ha), semi medium (2-4 ha), medium (4-10 ha) and large (>10 ha) and scores were given 1, 2, 3, 4, 5 and 6, respectively.

Category	Score
Landless (No land)	1
Marginal (<1 hectare)	2
Small (1-2 hectare)	3
Semi Medium (2-4 hectare)	4
Medium (4-10 hectare)	5
Large (>10 hectare)	6

3.2.2.9. Livestock holding:

It is referred as the number of animal including poultry maintained by the respondent at the time of investigation. For the purpose of calculation all animals/poultry were converted into Tropical Livestock units (TLU) as follows:

	Cattle	Buffalo	Sheep	Goats	Pigs	Horses	Camels	Chickens
TLU	0.5	0.5	0.1	0.1	0.25	0.8	1.1	0.01

(FAO, 2003; Chilonda & Otte, 2006)

Based on the above units, scoring was adopted. The scores obtained in each item were summed upto arrive at the livestock possession score of each respondent. They were classified into small, medium and large herd size on the basis of Mean ± S.D.

Category	Criteria
Small	(Mean –S.D)
Medium	(Mean ±S.D)
Large	(Mean +S.D)

3.2.2.10. Accessibility to telephone and mobile:

Respondents were asked to indicate the possession of telephone, mobile or both and were classified into three groups and the scores were given as follows:

Accessibility	Score
Telephone	1
Mobile	2
Telephone and mobile both	3

3.2.2.11. Number of mobile users in family:

At the time of data collection, respondents were asked to indicate number of mobile users in their family. Accordingly, respondents were classified into three categories and scores were given as follows:

Category	Score
Small (below 3 mobile users)	1
Medium (3 to 6 mobile users)	2
Large (above 6 mobile users)	3

Information and Communication pattern:

3.2.2.12. Source of information:

Source of information refers to the medium from where the respondents came to know about the existence of RTHS (1800-180-6224). Source of information was studied as perceived by livestock owners. Accordingly, the sources were classified into two categories, viz., localite and cosmopolite. Initially, two localite sources and eight cosmopolite sources were identified through telephonic informal discussions with farmers during pilot study. Sources were enlisted from where respondents came to know about existence of RTHS. Localite sources were family members and fellow farmers. Cosmopolite sources were KCC experts, radio, newspapers, social media (face book and whatsapp), RAJUVAS, television, animal husbandry department and animal fairs. Respondents were asked to indicate that through which source they came to know about existence of RTHS (1800-180-6224). The total frequency was calculated and based upon them, ranking was assigned against each source.

Type of source	Source of information	Score
A. Localite source	Family members	1
	Fellow farmers	2
B. Cosmopolite source	Kisan Call Centre (KCC)	3
	Radio	4
	News paper	5
	Social media (Face book, Whatsapp etc.)	6
	RAJUVAS	7
	Television	8
	Animal husbandry department	9
	Animal fair	10

3.2.2.13. Information sharing behaviour:

Information sharing behaviour refers to the extent to which the users shared two aspect of information received from RTHS. First one is upto which extent users share the information to other livestock owners about existence of RTHS. Respondents will categorized into three groups viz. Upto one person, upto 3 persons and more than 3 persons and score was given 1, 2 and 3, respectively.

Second one is, upto which extent respondents shared expert advices to others livestock owners. Respondents were categorized into three group's viz. Upto single person, upto 3 persons and more than 3 persons and score was given 1, 2 and 3, respectively. Results were discussed in frequency and percentage.

Information sharing behaviour	Sharing about RTHS toll free no. (1800-180-6224)	Sharing about advice to other livestock owners
Upto one person	1	1
Upto 3 person	2	2
Above 3 Person	3	3

3.2.2.14 Frequency of contact at RTHS:

3.2.2.14.1. Frequency of contact at RTHS to seek expert advice:

Frequency of contact means how many times respondents called at RTHS to seek expert advice for particular type of query related to animal husbandry. For studying the frequency of contact, respondents were asked to indicate the number of times they contacted RTHS. Accordingly, they were classified into three categories as follows:

Category of contact	Score
Once	1
Twice	2
Thrice and above	3

3.2.2.14.2. Frequency of contact at RTHS during last six months:

Respondents were asked to indicate frequency of contact at RTHS during the entire period of six months (January-2017 to June-2017) and their response were classified into following categories:

Category of contact	Score
Once	1
Twice	2
Thrice	3
More than thrice	4

3.2.2.15. Adoption:

Adoption is a decision making process to make full use of an innovation at best course of action available. More ever an innovation is an idea, practice or object perceived as new by an individual of other unit of adoption technologies, practice developed through research are also known as innovation. In the present study, the term adoption was operationally defined as the extent to which the recommended advices pertaining to animal husbandry was adopted by respondents of study area.

In the present study the extent of adoption was measured for following two aspects:

3.2.2.15.1. Extent of adoption level towards advice received from RTHS
3.2.2.15.2. Query wise adoption level of advice received from RTHS

Respondents were classified into 3 group's viz., fully adopted, partially adopted and not adopted and scores were given 2, 1 and 0, respectively. The livestock owners were asked to indicate any of the three alternative responses. In order to find out overall adoption level of various animal husbandry practices suggested by RTHS experts, the frequency number of livestock owners was multiplied by the respective score allotted to each response and adoption score was calculated. Extent of adoption was measured by means of an adoption index originally developed by Meena (1999) with suitable modifications. Adoption was calculated using adoption index formula which is as follows:

$$\text{Adoption Index} = \frac{\text{Obtained score}}{\text{Maximum Obtainable score}} \times 100$$

Where:

Obtained score = 2(X) +1(Y) +0(Z)

Maximum obtainable score= 2(X+Y+Z)

Where:

X = Number of livestock owners who have fully adopted the advice,

Y = Number of livestock owners who have partially adopted the advice,

Z = Number of livestock owners who have not adopted the advice,

X+ Y + Z = Total number of livestock owners interviewed.

As far as case of query wise (subject area) adoption is concerned, queries of all respondents were tabulated and analysed as per case wise, the frequency number of livestock owners was multiplied by the respective score allotted to each response and adoption level was calculated.

3.2.2.16. Satisfaction:

Satisfaction refers to the fulfilment of certain prior expectations related to a product or service. Satisfaction in this study is conceptualized as the effective reaction of livestock owners towards the use of RTHS. Satisfaction level of respondents was measured for following three aspects:

3.2.2.16.1. Overall satisfaction level towards advice received from RTHS

3.2.2.16.2. Query wise satisfaction level of respondents

3.2.2.16.3. Extent of satisfaction level of beneficiary livestock owners towards overall RTHS services

Respondents were asked to reveal the level of satisfaction and their responses were categorised into 3 categories named as highly satisfied, satisfied and not satisfied. Quantification was done by assigning a scoring pattern 2, 1 and 0, respectively for three categories of responses. The satisfaction level was assessed by using a procedure followed by Haque (1981) with suitable modifications.

The livestock owners were asked to indicate any of the three alternative responses. In order to find out overall satisfaction level of various animal husbandry practices suggested by RTHS experts, the frequency number of livestock owners was multiplied by the respective score allotted to each response and satisfaction level was calculated with the help of following formula and ranking obtained:

$$\textbf{Extent of satisfaction level} = \frac{\textbf{Obtained score}}{\textbf{Maximum Obtainable score}} \times 100$$

Where:

Obtained score = 2(X) +1(Y) +0(Z)

Maximum obtainable score= 2(X+Y+Z)

Where:

X = Number of livestock owners who were highly satisfied

Y = Number of livestock owners who were satisfied

Z = Number of livestock owners who were not satisfied

X+ Y + Z = Total number of livestock owners interviewed

As far as case of query wise (subject area) satisfaction is concerned, queries of all respondents were tabulated and analysed as per case wise, the frequency of livestock owners was multiplied by the respective score allotted to each response and satisfaction level was calculated with the help of above formula whereas, regarding satisfaction level towards overall RTHS services, initially, 11 statement were identified by informal discussion with respondents during pilot study and livestock owners were asked to indicate any of the three alternative responses (highly satisfied, satisfied and not satisfied) for each statement of satisfaction. In order to find out overall satisfaction, the frequency numbers of livestock owners were multiplied by the respective score allotted to each response and satisfaction level was calculated.

3.2.2.17. Categorization of queries/telephonic calls:

The categorization of telephonic calls registered at RTHS was operationally defined as the categorization of telephonic calls received by the call centre on the

basis of the month in which maximum telephonic calls are received, the queries for which telephonic calls are received, the subject area/stream for which major queries arise and the districts from which major queries are received. Data collected through IUMS, RAJUVAS, Bikaner (Secondary data) and telephonic personal interview (Primary data) were further tabulated, analysed and categorized on the basis of different criteria like state wise, division wise, district wise, case of query wise and month wise.

3.2.2.18. Constraints perceived by respondents:

Constraints are defined as obstacles faced by the farmers at the time of receiving advice of animal husbandry practices from RTHS. It varies from individual to individual and region to region. List of the constraints faced by the farmers while availing toll free service, were identified through pilot study by telephonic informal discussion with the beneficiary livestock owners. Once the constraints were identified, each respondent was asked separately to assign the seriousness against each of listed constraints as per the intensity of difficulties perceived by them on three point continuum scale as highly serious, serious and not serious with score 2, 1 and 0, respectively. The procedure followed by Varghese (2000) with some modification was used.

The score for each constraint will summed up. Higher the score, the more severe constraint as perceived by the respondents. The frequency number of livestock owners was multiplied by the respective score allotted to each response and constraint score was calculated with the help of following formula:

Constraint score = 2(X) + 1(Y) + 0(Z)

Where:

X = Number of livestock owners who perceived constraint as “Highly serious”

Y= Number of livestock owners who perceived constraint as “Serious”

Z = Number of livestock owners who perceived constraint as “Not serious”

3.2.2.19. Suggestions elicited by respondents:

Suggestions refer to advices and recommendations offered by respondents to improve the overall service of RTHS. Suggestions of respondents were collected by interview schedule through open ended questions.

3.3 Methods of data collection:

Registered queries from January-2017 to June-2017 were collected from IUMS, RAJUVAS, Bikaner and treated as base of secondary data.

3.3.1 Preparation of interview schedule:

A semi-structured interview schedule was developed to collect primary data from 150 randomly selected respondents of Bikaner and Jaipur districts. While constructing the interview schedule, the objectives and dimensions of the study were taken into consideration.

3.3.2 Pre-testing of interview schedule:

The schedule was pre tested in the actual field situation upon the respondents other than selected districts in order to remove ambiguity, if any. The background information about the area of the study was obtained by consultation with official and from available reports. Besides departmental documents, records, reports, books, newspaper and other available literature were also consulted to collect secondary data on related aspects.

3.3.3 Final data collection:

The primary data required for the study were collected from 150 respondents with the help of semi structured interview schedule through telephonic contact and discussion.

3.4 Statistical tools and methods use for data analysis:

The data were collected from the respondents and coded, tabulated, classified and analyzed. Statistical tools viz,. Frequency, Percentage, Mean and Standard Deviation were used to analyze the data and draw relevant inferences. In order to find out the nature of relationship between selected dependent variables with selected independent variables, correlation coefficient (r) was worked out.

3.4.1 Frequency

A simple frequency distribution was used to identify the number of respondents distributed on different groups.

3.4.2 Percentage:

Percentage was used to make the simple comparison of different groups.

3.4.3 Mean:

Sum of observed values of a set divided by the number of observations in the set is called a mean or an average. Mean, a measure of central tendency, was used to classify the RTHS beneficiaries based on the variation in independent variables. It was calculated by using formula:

$$\bar{X} \frac{\sum fX}{\sum f}$$

Where

$\bar{X}$ is the mean

f is the number of occurrences

$\sum fX$ is the sum of products fX

$\sum f$ is the total number of occurrences

3.4.4 Standard Deviation:

Standard deviation, a measure of dispersion, was used to classify the respondents into different groups based on the score obtained by the respondent. It was calculated by using the following formula:

$$S = \sqrt{\frac{\Sigma(X - \bar{X})^2}{N}}$$

3.4.5 Correlation coefficient:

Pearson correlation coefficient test was used to find out the nature of relationship between independent variables and dependent variables. Correlation coefficient of adoption and satisfaction with selected independent variables were calculated with following formula:

$$r = \frac{\sum(X-\overline{X})(Y-\overline{Y})}{\sqrt{\sum(X-\overline{X})^2}\sqrt{(Y-\overline{Y})^2}}$$

Where, $\overline{X}$ = mean of X variable

$\overline{Y}$ = mean of Y variable

4. RESULTS AND DISCUSSION

This chapter deals with the results of the present study. The findings have been presented on the basis of analysis of data using relevant statistical tools and techniques and in relation to the specific objectives of the study. The results of the study are presented under the following sub-heads:

4.1. Socio-economic profile of respondents

4.2. Categorization of the different queries

4.3. Adoption and Satisfaction level

4.4. Association between selected independent variables with dependent variables

4.5. Constraints perceived and suggestions elicited by respondents

4.1. Socio-economic profile of respondents:

The profile of the respondents in the present study highlighted their salient characteristics as they were assumed to influence the adoption and satisfaction level of respondents towards RTHS. The socio-economic profile of the respondents included different parameters viz. age, sex, education status, family size, family type, type of house, family occupation, land holding, livestock holding, accessibility to telephone and mobile, number of mobile users in family and information and communication pattern.

4.1.1. Age:

Results pertaining to age of respondents were depicted in Table 4.1. It could be observed from Table 4.1 that majority (67.33%) of the respondents belonged to middle age group (25 to 50 years) whereas, 27.33 per cent of the respondents belonged to young age group (below 25 years) and only 5.33 per cent of respondents were belonged to old age (above 50 years).

Table 4.1: Distribution of the respondents according to their age

(N=150)

S. No.	Category	Frequency	Per cent
1	Young (below 25 years)	41	27.33
2	Middle (25 to 50 years)	101	67.33
3	Old (above 50 years)	08	5.33

Usually livestock owners of middle age and young age are more enthusiastic than older for acquiring knowledge on latest animal husbandry technologies and they have more use of mobile phones for getting information related to animal husbandry technologies. Youth are more receptive to new communication tools and can act as an agent of change. These observations were in line with the findings of Agrawal *et al.* (2014), Meera (2008), Shankaraiah (2011), Ganeshan *et al.* (2013), Kanavi (2014), Patra *et al.* (2016) and Koshy (2016).

4.1.2. Sex:

Result pertaining to frequency distribution of sex of respondents was depicted in Table 4.2 which revealed that 94.66 per cent of the respondents were males. Rest (5.34%) of the respondents belonged to female category which indicated that males were using mobile technology frequently for communication with official or other agency. These results were in line with Jaishridhar (2013), Patra *et al*. (2016) and Koshy (2016).

Table 4.2: Distribution of the respondents according to their sex

(N=150)

S. No	Category	Frequency	Per cent
1	Male	142	94.66
2	Female	8	5.34

4.1.3. Education status:

Education of the individual determines their knowledge level and the literacy status of the individual. Data in Table 4.3 revealed that majority (61.33%) of respondents were graduate and above whereas, 0.66 per cent of the respondents were illiterates, 2.66 per cent had primary education, 6.66 per cent had completed middle schooling and 28.66 per cent studied upto secondary or higher secondary. Social awareness is directly proportional to the education status of society

Table 4.3: Distribution of the respondents according to their education status

(N=150)

S. No.	Category	Frequency	Percent
1	Illiterate	1	0.66
2	Primary	4	2.66
3	Middle	10	6.66
4	Secondary/ Higher secondary	43	28.66
5	Graduate and above	92	61.33

Educated people were more aware with information and communication technology, so they more utilized mobile technology. Thus, they made frequently telephonic calls at RTHS as compare to illiterate one. Findings were confirmative with the findings of Jagnathan (2004), Meera (2008), Singh *et al.* (2010), Savithramma (2011), Hanjabam (2013), Kanavi (2014) and Koshy (2016).

4.1.4. Family size:

The data in Table 4.4 revealed that majority (63.33%) of the respondents living in medium size (5 to 8 members) of family, while 13.33 per cent of them belonged to small size (upto 4 members) and 23.33 per cent were residing in large (above 8 members) family. Similar results were reported by Agrawal *et al.* (2014), Jillella (2016) and Nargawe (2017).

Table 4.4: Distribution of the respondents according to their family size

(N=150)

S. No	Category	Frequency	Per cent
1	Small (upto 4 members)	20	13.33
2	Medium (5 to 8 members)	95	63.33
3	Large (above 8 members)	35	23.33

4.1.5. Family type:

The data of Table 4.5 revealed that out of 150 respondents, majority (74%) of respondents were living in Joint family and only 26 per cent had nuclear type of family. Thus, it can be said that joint family system is still dominating in rural society.

Table 4.5: Distribution of the respondents according to their family type

(N=150)

S. No	Category	Frequency	Per cent
1	Nuclear	39	26
2	Joint	111	74

4.1.6. Type of house:

Data from Table 4.6 revealed that majority (83%) of the respondents had pucca type of houses whereas, 10 per cent of the respondents were reported having mixed type of houses. Only 7 per cent of livestock owners had kutcha type of houses.

Table 4.6: Distribution of the respondents according to their type of house

(N=150)

S. No	Category	Frequency	Per cent
1	Katcha	10	07
2	Pucca	125	83
3	Mixed	15	10

4.1.7. Family occupation:

Data in Table 4.7 indicated that 67.33 per cent of the respondents were having animal husbandry and agriculture as their major family occupation. However, 30.67 per cent respondents were engaged in other business (Private/Government) besides animal husbandry and agriculture. Only 2 per cent respondents were reported who had animal husbandry alone as their major family occupation. None of the respondents reported labour as occupation along with animal husbandry and agriculture.

Table 4.7: Distribution of the respondents according to their family occupation

(N=150)

S. No	Category	Frequency	Per cent
1	Animal Husbandry	3	2
2	Animal Husbandry + Agriculture	101	67.33
3	Animal Husbandry + Agriculture + Labour	0	0
4	Animal Husbandry + Agriculture + Business(Private/Government)	46	30.67

The findings clearly indicated that majority of the respondents were dependent exclusively on animal husbandry and agriculture as their family occupation. They could not depend on agriculture alone because of low and irregular rainfall in Rajasthan makes agriculture as intermittent source of family income. Animal husbandry could be option of agriculture as occupation due to potential advantage of livestock holding which provides sustainable livelihood throughout the year. It is also consider most important source of income because serves as most reliable source even in natural calamity. The findings were in consonance with the findings of Jillella (2013), Koshy (2016).

4.1.8. Land holding:

Data in Table 4.8 indicated that majority (34.66%) of the respondent belonged to large farmer's category having more than 10 hectare of land. However, 4 per cent of respondent were found landless. Sixteen per cent of the respondents belonged to medium farmer's category having 4 to 10 hectare of land and about 21 per cent fell under semi medium farmer's category owing to 2 to 4 hectare of land. Six per cent respondents belonged to marginal farmer’s category having less than 1 hectare, while 18.67 per cent livestock owners fell under small farmer’s category owing to 1-2 hectare of land.

Table 4.8: Distribution of the respondents according to their land holding

(N=150)

S. No	Category	Frequency	Per cent
1	Landless (No land)	06	4
2	Marginal (<1 hectare)	09	6
3	Small (1-2 hectare)	28	18.67
4	Semi Medium (2-4 hectare)	31	20.67
5	Medium (4-10 hectare)	24	16
6	Large (>10 hectare)	52	34.66

Thus, findings clearly indicated that majority of respondents were large land owners because they had joint family in present scenario and thus non fragmentation of land was there.

4.1.9. Livestock holding:

Data in Table 4.9 clearly indicated that, majority (79.33%) of the respondents were found medium livestock holding category. About 13 per cent of respondents fell under large livestock holding category, while only 7.34 per cent of the respondents belonged to small livestock holding category in the study area.

Table 4.9: Distribution of the respondents according to livestock holding

(N=150)

S. No	Category	Frequency	Per cent
1	Small (<1.12)	11	7.34
2	Medium (1.12 to 12.72)	119	79.33
3	Large (>12.72)	20	13.33

Past studies on this field conducted by Verma (1993), Jillella (2013) and Jillella (2016) were in line with these results that majority of the respondents fell under medium livestock holding category.

4.1.10. Accessibility to telephone and mobile:

It was clearly indicated from Table 4.10 that 100 per cent of the respondents had accessibility to mobile phone. Out of 150 respondents, only 5.33 per cent of the respondents had access to both telephone and mobiles. However, none of the respondents was found to have telephone alone.

Table 4.10: Distribution of respondents according to their accessibility to telephone and mobile

(N=150)

S. No.	Accessibility to telephone and mobile	Frequency	Per cent
1.	Telephone	0	0
2.	Mobil..e	150	100
3.	Both telephone and mobile	8	5.33

4.1.11. Number of mobile users in family:

The results of Table 4.11 revealed that, 59.33 per cent of the respondents belonged to medium group of mobile users (3 to 6 mobile users in a family) whereas, 26 per cent of the respondents were reported small mobile users (less than 3 mobile users in a family. Only 14.67 per cent of respondents belonged to large group of mobile users (more than 6 mobile users in a family).

Table 4.11: Distribution of the respondents according to number of mobile users in their family

(N=150)

S. No	Category	Frequency	Per cent
1.	Small (below 3 users)	39	26
2.	Medium (3 to 6 users)	89	59.33
3.	Large (above 6 users)	22	14.67

Modern era is revolutionized by ICT and the mobile is easily accessible to most of the livestock owners which is an important media of transfer the technology from experts to livestock owners.

4.1.12. Information and communication pattern:

4.1.12.1. Sources of information:

Data in Table 4.12 revealed the sources of information as perceived by respondents from where they came to know about existence of RTHS. It was evident from Table 4.12 that majority (42.66%) of respondents reported KCC as a major source of information about the existence of RTHS number (1800-180-6224) and occupied 1st rank followed by radio (16.66%), news paper (13.33%), social media (8.66%), RAJUVAS (5.33%) and fellow farmers (5.33%), family members (4.66%), department of animal husbandry (2%), television (0.66%) and livestock fair(0.66%) with 2nd, 3rd, 4th, 5th, 5th, 6th, 7th, 8th and 8th rank, respectively

Table: 4.12: Distribution of respondents according to their source of information for RTHS

(N=150)

S. No	Type of source	Source of information	Frequency (%)	Rank
1.	**Localite sources**	Family members	07 (4.66)	VI
		Fellow farmers	08 (5.33)	V
2.	**Cosmopolite sources**	Kisan Call Centre (KCC)	64 (42.66)	I
		Radio	25 (16.66)	II
		News paper	20 (13.33)	III
		Television	01 (0.66)	VIII
		Social media (Face book, Whatsapp)	13 (8.66)	IV
		RAJUVAS	08 (5.33)	V
		Department of animal husbandry	03 (2)	VII
		Livestock fair	01 (0.66)	VIII
		Total	**150 (100)**	

(Figures in parentheses indicate percentages)

It was clearly indicated that fellow farmers were major localite source among fellow farmers and family members whereas, KCC was major cosmopolite source among all 8 cosmopolite sources (KCC, radio, television, newspaper, social media, livestock fairs, RAJUVAS, department of animal husbandry) from where respondents came to know about existence of RTHS toll free (1800-180-6224).

This might be due to fact that majority of respondents were literate and most of them possessed mobile. Thus, easily get information about existence and functions of RTHS from localite and other sources. They call frequently when they seek advice from RTHS experts to solve their problem related to animal husbandry.

Respondents were having regular access to televisions, mobile phone, newspaper and radio. RAJUVAS also advertise its toll free number through radio telecast programme “Dheene ri Batan” every Thursday of week and periodically published magazine’s viz; “Pashupalan Naye Aayam”, “News letter”, “Pashu Aahar aur Chara Bulletin”. Besides these, farmers also aware about RAJUVAS toll free helpline service through their frequently visit at different centres of university, VUTRC, LRS, livestock seminars and Kisan Gosthies. Scientists/teaching staff of RAJUVAS also popularize the toll free number among farmers during their regular visit at different villages under MGMG (Mera Gaon Mera Gaurav) programme.

4.1.12.2. Information sharing behaviour:

4.1.12.2.1. Sharing of information about existence of RTHS (1800-180-6224):

Data in Table 4.13 revealed that, majority (80.67%) of the respondents had shared source of information of RTHS (1800-180-6224) which is located at RAJUVAS, Bikaner, upto one person whereas, 18.67 per cent respondent shared information upto 3 persons. Only 0.67 per cent of respondents were reported to share above 3 persons.

Table 4.13: Distribution of the respondents according to sharing of information about existence of RTHS (1800-180-6224)

(N=150)

S. No.	Sharing of information about tool free number (1800-180-6224)	Frequency	Per cent
1	Upto one person	121	80.67
2	Upto 3 person	28	18.67
3	Above 3 Person	01	0.67

Promptness of service, easily accessible and free service to solve the problems related to animal husbandry made the RTHS more popular among livestock owners. Most of the livestock owners in the study area are educated upto graduate level which made them more aware to share information about RTHS to benefit others.

4.1.12.2.2. Sharing of advice to other livestock owners:

Data in Table 4.14 revealed that 60 per cent of the respondents shared the advices recommended by RTHS upto 1 person in their locality followed by 26.67 per cent of the respondents those shared information upto 3 persons. Nearly, 13.33 per cent of the respondents shared advices more than 3 persons.

Table 4.14: Distribution of respondents according to sharing of advice to other livestock owners

(N=150)

S. No	Sharing of recommended expert advice to other livestock owners	Frequency	Per cent
1	Upto one person	90	60.00
2	Upto 3 person	40	26.67
3	Above 3 Person	20	13.33

Similar kind of problem raised by the fellow livestock owners might be reason to share recommended advice with fellow farmers.

4.1.12.3. Frequency of contact at RTHS:

4.1.12.3.1. Frequency of contact at RTHS to seek expert advice:

Respondents were asked at the time of interview that how many times they contacted at RTHS to seek expert advice on particular problem/query related to animal husbandry. Results in Table 4.15, revealed that majority (68.67%) of livestock owners contacted single time to get expert advice from RTHS. Total 26 per cent of respondents had contacted twice at RTHS and 5.33 per cent of respondents contacted 3 times or more to get relevant information from RTHS.

Table 4.15: Distribution of respondents according to their frequency of contact at RTHS to seek expert advice for particular type of query

(N=150)

S. No	Category of contact	Frequency of contact	Per cent
1	Once	103	68.67
2	Twice	39	26
3	Thrice and above	8	5.33

Respondents had to call multiple times to resolve their problem because of duration of call was managed at 4 min then after call will automatically cut off. Thus, some of the respondents had to contact twice, thrice or more to clarify their query on particular problem.

4.1.12.3.2. Frequency of contact at RTHS during last six months:

Respondents were asked to indicate frequency of contact at RTHS during the entire period of six months (January-2017 to June-2017) and their responses were depicted in Table 4.16, revealed that majority (48%) of livestock owners contacted once to get expert advice from RTHS during six months. However, 22 per cent of respondents called twice and 16 per cent of respondents called thrice at RTHS

Table 4.16: Distribution of the respondents according to their frequency of contact at RTHS during last six months

(N=150)

S. No	Category of contact	Frequency of contact	Per cent
1.	Once	72	48
2.	Twice	33	22
3.	Thrice	24	16
4.	More than thrice	21	14

It was interesting to note that 14 per cent of respondents contacted more than thrice to seek advices from RTHS experts.

4.2. Categorisation of queries:

4.2.1. State wise distribution of telephonic calls:

State wise call registered at RTHS, RAJUVAS, Bikaner was depicted in Table 4.17. Cursory look at result indicated that maximum number of telephonic calls

(84.88%) were made by the livestock owners of Rajasthan, occupied first rank during 1 January-2017 to 30 June-2017. This was followed by the telephonic calls made by Haryana (2.86%), Uttar Pradesh (2.06%), Madhya Pradesh (1.68%), Delhi (1.68%) and Gujarat (1.60%) with 2nd, 3rd, 4th, 4th and 5th rank, respectively.

Table 4.17: Distribution of telephonic calls according to state wise

S. No.	State	Frequency (%)	Rank
1	Rajasthan	4232 (84.88)	I
2	Haryana	143 (2.86)	II
3	Uttar Pradesh	103 (2.06)	III
4	Madhya Pradesh	84 (1.68)	IV
5	Delhi	84 (1.68)	IV
6	Gujarat	80 (1.60)	V
7	Punjab	49 (0.98)	VI
8	Maharashtra	48 (0.96)	VII
9	Andhra Pradesh	30 (0.60)	VIII
10	Himachal Pradesh	20 (0.40)	IX
11	Bihar	19 (0.38)	X
12	Karnataka	17 (0.34)	XI
13	Jammu	15 (0.30)	XII
14	West Bengal	13 (0.26)	XIII
15	Jharkhand	13 (0.26)	XIII
16	Tamilnadu	10 (0.20)	XIV
17	Chhattisgarh	8 (0.16)	XV
18	Uttrakhand	6 (0.12)	XVI
19	Assam	4 (0.08)	XVII
20	Kerala	4 (0.08)	XVII
21	Mizoram	1 (0.02)	XVIII
22	Orissa	1 (0.02)	XVIII
23	Goa	1 (0.02)	XVIII
24	Tripura	1 (0.02)	XVIII
	Total	**4986 (100)**	

(Figures in parentheses indicate percentages)

The least number of telephonic calls (0.02%) were made by livestock owners from Mizoram, Orissa, Goa and Tripura, occupied last 4 positions in order. The findings clearly indicated that respondents belonged to Haryana, Punjab, Madhya Pradesh, Gujarat and Delhi were residing in the vicinity of districts of Rajasthan so livestock owners of these states were more aware about RTHS. It was also revealed that livestock owners of Mizoram, Orissa, Goa and Tripura less frequently contacted at RTHS. It might be due to language barrier and less awareness about RTHS.

4.2.2. Districts wise distribution of telephonic calls:

The telephonic calls made by the livestock owners to RTHS were analyzed district-wise. Cursory look at the Table 4.18 indicate that total 4232 telephonic calls registered at RTHS from January-2017 to June-2017 from 33 districts of Rajasthan. Among all districts, maximum number of telephonic calls made by the livestock owners of Bikaner district (433) occupied first rank followed by Jaipur district (336) occupied 2nd rank. This was followed by the telephonic calls made from livestock owners of Hanumangarh (310), Sri Ganganagar (289) and Alwar district (266) occupied the next three positions. The least number of telephonic calls were made from the livestock owners from Pratapgarh (22), Sirohi (19), Banswara (17), Rajasamand (13) and Dungarpur (10) districts occupied the last five positions.

Table 4.18: Distribution of telephonic calls according to district wise

S. No.	District	Number of call registered	Per cent	Rank
1	Bikaner	433	10.23	I
2	Jaipur	336	7.93	II
3	Hanumangarh	310	7.3	III
4	Sri Ganganagar	289	6.8	IV
5	Alwar	266	6.28	V
6	Churu	220	5.1	VI
7	Jodhpur	205	4.82	VII
8	Nagaur	204	4.8	VIII
9	Barmer	197	4.65	IX
10	Sikar	168	3.96	X
11	Bharatpur	166	3.92	XI
12	Jhunjhunu	158	3.73	XII
13	Jhalawar	144	3.4	XIII
14	Sawaimadhopur	104	2.45	XIV
15	Bhilwara	91	2.16	XV
16	Dausa	89	2.1	XVI
17	Jalore	82	1.9	XVII
18	Ajmer	72	1.7	XVIII
19	Pali	72	1.7	XVIII
20	Chittorgarh	71	1.67	XIX
21	Karauli	71	1.67	XIX
22	Bundi	66	1.55	XX
23	Tonk	64	1.5	XXI
24	Jaisalmer	64	1.5	XXI
25	Kota	61	1.4	XXII
26	Udaipur	56	1.32	XXIII
27	Dholpur	54	1.27	XXIV
28	Baran	38	0.89	XXV
29	Pratapgarh	22	0.51	XXVI
30	Sirohi	19	0.44	XXVII
31	Banswara	17	0.4	XXVIII
32	Rajasmand	13	0.3	XXIX
33	Dungarpur	10	0.23	XXX
Total		**4232**	**100**	

The results clearly indicated that maximum numbers of telephonic calls were received from Bikaner and Jaipur districts. It might be due to reason that livestock owners of Bikaner and Jaipur districts were more aware about various source of information of RTHS due to existing facility of university campus.

4.2.3. Division wise distribution of telephonic calls:

The data presented in Table 4.19 depicted division wise telephonic calls registered at RTHS. Results indicated that majority (29.58%) of telephonic calls were made by Bikaner division (Bikaner, Churu, Ganganagar and Hanumangarh districts) and was ranked first in Rajasthan while, Jaipur division (Jaipur, Alwar, Sikar, Dausa and Jhunjunu districts) stood second with 24.03 per cent of telephonic calls. However, the least per cent of telephonic calls (4.46%) were made by Udaipur division (Udaipur, Chittorgarh, Rajasamand, Dungarpur, Banswara and Pratapgarh districts) and ranked seventh in order.

Table 4.19: Distribution of telephonic calls according to division wise

S. No.	Division	Number of registered Telephonic calls	Per cent	Rank
1	Bikaner	1252	29.58	I
2	Jaipur	1017	24.03	II
3	Jodhpur	639	15.09	III
4	Ajmer	431	10.18	IV
5	Bharatpur	395	9.33	V
6	Kota	309	7.3	VI
7	Udaipur	189	4.46	VII
Total telephonic calls		**4232**	**100**	

Jodhpur, Ajmer, Bharatpur and Kota divisions stood at 3rd, 4th, 5th and 6th rank with 15.09, 10.18, 9.33 and 7.3 per cent of telephonic calls, respectively.

4.2.4. Query wise distribution of telephonic calls:

Data in Table 4.20 indicated that majority (48.10%) of the telephonic calls were related medicinal problems occupied rank first in order whereas, production and management related problems (17.65%), gynaecological problems (12.52%), animal feeding and nutrition (8.29%), dairy entrepreneurship and dairy marketing (6.37%), animal genetics and breeding (3.54%) problems stood at rank 2nd, 3rd, 4th, 5th and 6th, respectively. However, the least telephonic calls were related to surgical problems (2.74%) and disease investigations and diagnostics related problems (0.75%) occupied last rank in order.

Considering the nature of query posed by the farmers, it was observed that majority of telephonic calls were related to medicinal problems. The occurrences of various seasonal, infectious, parasitic and managemental diseases were most common and serious problems faced by livestock owners. Hence, livestock showed more interest for medicinal telephonic calls.

Table 4.20: Distribution of telephonic calls according to query/problem wise

S. No.	Nature of query	Frequency (%)	Rank
1.	Medicinal problems	2036 (48.10)	I
2.	Livestock Production and Management problems	747 (17.65)	II
3.	Gynaecological problems	530 (12.52)	III
4.	Animal Feeding and nutrition problems	351 (8.29)	IV
5.	Dairy entrepreneurship and dairy marketing	270 (6.37)	V
6.	Animal genetics and Breeding problems	150 (3.54)	VI
7.	Surgical problems	116 (2.74)	VII
8.	Disease investigation and diagnosis problems	32 (0.75)	VIII
	Total	**4232 (100)**	

(Figures in parentheses indicate percentages)

Respondents posed queries on livestock production and management practices because management of livestock greatly affects production. It provides a platform for ensuring sustainability (biological and economic).

Results revealed that livestock owners also interested for query on dairy entrepreneurship, livestock insurance and subsidiary loan schemes provided by state as well as central government so that they could avail to prosper in animal husbandry to support their animal husbandry entrepreneurial.

4.2.5. Month wise distribution of telephonic calls:

The data presented in Table 4.21 revealed month-wise telephonic calls registered at RTHS. It indicated that maximum number of telephonic calls were made in the month of January (17.77 %) and February (17.62%) followed by May (17.55%) and March (17.36%).

Table 4.21: Distribution of telephonic calls according to month wise.

S. No.	Month	Number of telephonic calls	Per cent	Rank
1	January	750	17.77	I
2	February	746	17.62	II
3	March	735	17.36	IV
4	April	572	13.51	VI
5	May	743	17.55	III
6	June	686	16.20	V
	Total	**4232**	**100**	

The least number of telephonic calls were made in the month of June (16.20%) and April (13.51%).

4.3. Adoption and Satisfaction level:

4.3.1. Adoption level:

4.3.1.1 Extent of adoption of advice:

What queries they were posed to RTHS were asked by conducting telephonic personnel interview method and information collected on extent of adoption for advice recommended by RTHS. It was revealed from Table 4.22

that about 57 per cent of respondents fully adopted the advice whereas, 10 per cent partially adopted. About 33 per cent of respondents not adopted advice received from RTHS.

Table 4.22 also indicated overall extent of adoption level towards advices recommended by RTHS, was 61.66 per cent. The partial adoption might be due to the unavailability of the inputs or resources suggested by the call centre agents.

Table 4.22: Distribution of respondents according to extent of adoption of advice

(N=150)

S. No.	Extent of adoption of advice	Frequency (percent)	Overall percentage of adoption level
1	Fully adopted	85 (56.67)	61.66%
2	Partially adopted	15 (10)	
3	Not adopted	50 (33.33)	
	Total	**150 (100)**	

The probable reason of low and partial adoption adoption might be due to facts that respondents were seeking information for their awareness and knowledge on some aspects such as information on dairy entrepreneurship, loan and subsidiary schemes and information on breed to start dairy business for different locations etc. Adoption of such advices was decision making process which took longer time for fully adoption.

4.3.1. Query wise adoption:

A perusal of Table 4.23 revealed query wise adoption level of advice by respondents received from RTHS that information on medicinal problems has maximum (65.34%) adoption level and was ranked first. Advices on livestock production and management related problems stood at second rank with 60 per cent of adoption followed by gynaecological problems (3rd rank) and animal feeding and nutrition problems (4th rank) with 58.82 and 50 per cent of adoption, respectively.

Table 4.23: Distribution of respondents according to query wise adoption

(N=150)

S. No.	Type of Query	Frequency	Fully adopted	Partially adopted	Not adopted	Adoption level	Rank
1.	Medicinal problems	101	65	2	34	65.34	I
2.	Livestock production and management problems	15	7	4	4	60	II
3.	Gynaecological problems	17	7	6	4	58.82	III
4.	Animal feeding and nutrition problems	5	2	1	2	50	IV
5.	Dairy entrepreneurial and marketing problems	9	3	2	4	44.44	V
6.	Surgical problems	3	1	0	2	33.33	VI
	Total	**150**	**85**	**15**	**50**	**61.66**	

Least adoption was found for information of dairy entrepreneurship and dairy marketing related queries (5th rank) and surgical problems (6th rank) with 44.44 and 33.33 per cent of adoption, respectively.

4.3.2. Satisfaction:

4.3.2.1. Extent of satisfaction towards expert advice:

The data in Table 4.24 revealed that about 69 per cent of respondents were highly satisfied, 9.33 per cent respondents were satisfied whereas, 22 per cent of respondents were not satisfied towards advice offered by RTHS.

Table 4.24: Distribution of respondents according to their extent of satisfaction towards expert advice

(N=150)

S. No.	Extent of satisfaction level of respondents	Frequency	Overall percentage of satisfaction
1	Highly satisfied	103 (68.67)	73.33%
2	Satisfied	14 (9.33)	
3	Not satisfied	33 (22)	
	Total	**150**	

The overall extent of satisfaction level towards advice received from RTHS was 73.33 per cent.

4.3.2.2. Extent of satisfaction towards overall services of RTH:

Results pertaining to satisfaction level of respondents towards overall service of RTHS depicted in Table 4.25 which, revealed that respondents showed their highest satisfaction (91.33%) towards behaviour of veterinary experts. 84.67 per cent of the respondents were highly satisfied whereas, 13.33 per cent were satisfied. Only 2 per cent of respondents expressed their dissatisfaction towards the behaviour of veterinary experts providing advice at RTHS. Respondents showed 90.66 per cent of satisfaction towards knowledge competency of RTHS veterinary experts. Majority of respondents (83.33%) were highly satisfied followed by satisfied (14.67%) whereas, 2 per cent were not satisfied towards knowledge of veterinary expert.

Table 4.25: Distribution of respondents according to their extent of satisfaction towards overall service

(N=150)

S. No.	Statements	Highly Satisfied	Satisfied	Not Satisfied	Satisfaction Level	Rank
1	Behaviour of RTHS technical person	120 (80)	24 (16)	6 (4)	88	IV
2	Behaviour of expert	127 (84.67)	20 (13.33)	3 (2)	91.33	I
3	Knowledge competency of expert	125 (83.33)	22 (14.67)	3 (2)	90.66	II
4	Problem solving competency of experts	122 (81.33)	23 (15.33)	5 (3.33)	89	III
5	Accessibility of expert on call	117 (78)	29 (19.33)	4 (2.67)	87.66	V
6	Language competency of expert	116 (77.33)	27 (18)	7 (4.67)	86.33	VI
7	Working hours of RTHS	115 (76.67)	26 (17.33)	9 (6)	85.33	VII
8	Conversation duration of call	113 (75.33)	24 (16)	13 (8.67)	83.33	IX
9	Competency of experts in promptness of reply	109 (72.67)	25 (16.67)	16 (10.67)	81	XI
10	Pick up the telephonic calls by RTHS officials	118 (78.67)	17 (11.33)	15 (10)	84.33	VIII
11	Relevancy of expert advice towards farmers query	102 (68)	40 (26.67)	8 (5.33)	81.33	X
	Overall satisfaction	**1284 (77.8)**	**277 (16.78)**	**89 (5.39)**	**86.21**	

(Figures in parentheses indicate percentages)

Respondents reported 89 per cent of satisfaction towards problem solving competency of experts of RTHS to solve respondent's problem. Majority (81.33%) of respondents were highly satisfied followed by satisfied (15.33%) and not satisfied (3.33%) towards problem solving competency of experts. In terms of behaviour of RTHS technical personnel, 88 per cent of satisfaction was found. Majority (80%) of respondents were highly satisfied followed by satisfied (16%) and not satisfied (4%) towards behaviour of RTHS technical personnel.

Results pertaining to satisfaction level of respondents towards accessibility of RTHS expert, whenever respondents seek help showed that 87.66 per cent of satisfaction showed by respondents. Majority of respondents (78%) were highly satisfied whereas, 19.33 per cent were satisfied. Only 2.67 per cent of respondents expressed their dissatisfaction towards accessibility of RTHS officials. In case of language competency of experts, respondents revealed 86.33 per cent of satisfaction. Majority (77.33%) of respondents were highly satisfied followed by satisfied (18%) and not satisfied (4.67%). Respondents showed 85.33 per cent of satisfaction for working hours of RTHS. Majority (76.67%) of respondents were highly satisfied followed by satisfied (17.33%) and not satisfied (6%).

Respondents revealed 84.33 per cent of satisfaction towards pick up the telephonic calls facility by RTHS officials. Majority (78.67%) of respondents were highly satisfied followed by satisfied (11.33%) and not satisfied (10%) towards pick up the telephonic calls by RTHS officials. Results pertaining to conversation duration of call revealed 83.33 per cent of satisfaction. Majority (75.33%) of respondents were highly satisfied followed by satisfied (16%) and not satisfied (8.67%). Respondents revealed 81.33 per cent of satisfaction towards relevancy of expert advice towards farmers query. Majority (68%) of respondents were highly satisfied followed by satisfied (26.67%) and not satisfied (5.33%). For competency of experts in promptness of reply, respondents revealed 81 per cent of satisfaction. Majority (72.67%) of respondents were highly satisfied followed by satisfied (16.67%) and not satisfied (10.67%).

Table 4.25 also revealed 86.21 per cent satisfaction towards overall service of RTH.

4.3.2.3. Query wise satisfaction:

A perusal of Table 4.26 revealed satisfaction of 150 respondents towards query/problem raised at RTHS. It was found that advices related to medicinal problems had maximum (80.20%) satisfaction level and ranked first whereas, satisfaction level of surgical problems was least (33.33%) and ranked sixth, last rank in all problems. Livestock production and management related problems had 63.33 per cent level of satisfaction which ranked second.

Table 4.26: Distribution of respondents according to query wise satisfaction

(N=150)

S. No	Type of query	Frequency	Percentage level of satisfaction	Rank
1.	Medicinal problems	101	80.20	I
2.	Livestock production and management problems	15	63.33	II
3.	Gynaecological problems	17	61.76	III
4.	Animal feeding and nutritional problems	5	60	IV
5.	Dairy entrepreneurial and dairy marketing problems	9	50	V
6.	Surgical problems	3	33.33	VI
	Total	**150**	**73.33**	

In the satisfaction series, satisfaction response towards gynaecological problems had 61.76 per cent satisfaction level and ranked third. This was followed by response towards animal feeding and nutritional (4^{th} rank), dairy entrepreneurial and dairy marketing (5^{th} rank) problems with 60 and 50 per cent of satisfaction, respectively for their solution of concerned problems.

4.4 Association between selected independent variables with dependent variables:

4.4.1 Association of selected independent variables with adoption of advice:

The results of the correlation analysis were depicted in Table 4.27. It indicated that education and family type had positive and significant relationship with adoption at 1 per cent level of significance whereas, family size had positive and significant relationship with adoption of advice at 5 per cent level of significance. As education level increases, awareness also increases for utilisation of communication tools like mobiles and more educated respondents follow the advices recommended by RTHS.

Table 4.27: Correlation co-efficient of adoption with selected independent variables

S. No	Independent variable	Correlation co-efficient (r)
1.	Age	-0.66
2.	Sex	-0.57
3.	Education	0.204**
4.	Family size	0.137*
5.	Family type	0.220**
6.	House type	0.00
7.	Occupation	0.480
8.	Livestock holding	0.101
9.	Mobile consumer	0.085

***correlation is significant at the 0.01 level (1%)*
**correlation is significant at the 0.05 level (5%)*

Family size and family type were found to have positive significant relationship with adoption of advice which clearly indicated that joint family system is still prevalent in study area. Respondents belonged to joint family system, posses more number of mobiles and found frequently contact at RTHS and likely to adopt and follow advices recommended from RTHS.

Various independent variables like occupation, livestock holding and number of mobile consumers in family were positively correlated, while age and sex of respondents were negatively correlated and had not significant relationship with adoption level.

Age was negatively correlated with non significant relationship with adoption clearly indicated that younger respondents are more conversant with mobile phone technologies whereas, elder group of respondents more rely on the conventional sources for information on animal husbandry and they less utilise mobile for getting information and also less likely to adopt the advices from RTHS

4.4.2 Association of selected independent variables with satisfaction level of respondents:

The result was depicted in Table 4.28 that satisfaction was positively correlated with their education, family size, family type, occupation, livestock holding and number of mobile consumers in family. Age and sex were negatively correlated with satisfaction level of respondents towards RTHS. Family type of respondents had positively significant relationship with satisfaction. It was clearly indicated that more family members in joint family likely to frequently contact at RTHS and also satisfied with the service and advices received from RTHS.

Table 4.28: Correlation co-efficient of satisfaction with selected independent variables

S. No.	Independent variable	Correlation of co-efficient
1.	Age	-0.037
2.	Sex	-0.069
3.	Education	0.106
4.	Family size	0.126
5.	Family type	0.163*
6.	House type	00
7.	Occupation	0.125
8.	Livestock holding	0.101
9.	Mobile consumer	0.120

Old person and women rarely contact at RTHS showed less satisfaction.

4.5. Constraints perceived and suggestions elicited by respondents:

4.5.1. Constraints perceived by respondents:

The frequency distribution of constraints faced by the respondents while using RTHS was reported in Table 4.29 implied that the most severe constraint in effective functioning of RTHS was lack of detail information on loan, insurance and various subsidiary governmental schemes and ranked first in constraint series. They felt that the information on the insurance of livestock and various subsidiary loan schemes provided by state animal husbandry department was not completely updated due to which they could not properly protect their animals from loss and could not get beneficial from governmental schemes.

Table 4.29: Distribution of respondents according to the constraints perceived by them

(N=150)

S. No.	Constraint	Highly serious	Serious	Not serious	Total score	Rank
1	Accessibility of expert on call	6	29	115	41	VI
2	Call not attended during holidays	6	27	117	39	VII
3	Behaviour of technical personnel	7	24	119	38	VIII
4	Lack of detail information on loan, insurance and governmental subsidiary schemes	32	5	113	69	I
5	Incompetency of RTHS expert to satisfy farmer query	5	23	122	33	X
6	Language barrier between expert and respondents	8	27	115	43	V
7	Delay in call reply	16	24	110	56	II
8	Delay in pickup of call	17	17	116	51	IV
9	Frequently engaged RTHS call system	3	29	118	35	IX
10	Short duration of permitted call	15	24	111	54	III

Delay in call reply ranked second in the order. This constraint was followed by short duration of permitted call, delay in pickup of call, language barrier between expert and respondents, accessibility of expert on call, call not attended during holidays, behaviour of technical person, frequently engaged RTHS call system and incompetency of RTHS expert to satisfy farmer query with 3rd, 4th, 5th, 6th, 7th, 8th, 9th and 10th rank, respectively.

4.5.2. Suggestions elicited by respondents

A perusal of Table 4.30 revealed the suggestions elicited by respondents for further improvement RTHS. It was reported that majority (52%) of respondents suggested need to provide detail Information on various governmental subsidiary loan schemes and insurance and ranked first whereas, 20 per cent of respondents did not elicit any suggestion and ranked 9th in order. However, RTHS facility should be accessible on holiday also was elicited by 20.66 per cent of respondents and was ranked eighth. Call duration

should be increased was elicited by 43.33 per cent of the respondents and ranked second. Telephonic call should be picked up more timely was elicited by 40 per cent of the respondents and ranked third in the order followed by along with voice facility, text message facility should be provided (33.33%), problem of call engage should be resolve (30%), advice should be simple and in local language (26.66%) and advice should be relevant and useful for livestock owners (23.33%) with 4th, 5th, 6th and 7th, respectively.

Table 4.30: Distribution of respondents according to suggestions elicited by them

(N=150)

S. No.	Suggestions	Frequency (%)	Rank
1.	Need to provide detail Information on governmental subsidiary loan schemes and insurance	78 (52)	I
2.	Call duration should be increased	65 (43.33)	II
3.	Call should be picked up more timely	60 (40)	III
4.	Along with voice facility, text message facility should be provided	50 (33.33)	IV
5.	Problem of call engage should be resolve	45 (30)	V
6.	Expert advice should be in simple and local language	40 (26.66)	VI
7.	Expert advice should be relevant and useful for livestock owners	35 (23.33)	VII
8.	RTHS facility should be accessible on holiday also	31 (20.66)	VIII
9.	No response	30 (20)	IX

(Figures in parentheses indicate percentages)

5. SUMMARY AND CONCLUSIONS

This chapter deals with the summary of the findings, conclusions, implications and recommendations of the study.

Livestock plays an important role in Indian economy. About 20.5 million people depend upon livestock for their livelihood. India has vast livestock resources. Livestock sector contributes 4.11 per cent GDP and 25.6 per cent of total Agriculture GDP. Although, India is blessed with highest population of livestock but the poor net productivity is of serious concern. Because of poor information dissemination to the farmers, there exists a wide gap between technologies developed and actually being adopted or used by the farmers. It is estimated that 60 per cent of the farmers do not access any source of information for advanced agricultural technologies, resulting into huge adoption gap (NSSO, 2005). It is also justified by a situation assessment survey of farmers done by the National Sample Survey Organization (NSSO) on access to modern technology for farming, which indicates that only 5.1 per cent of the households access information on animal husbandry against 40.4 per cent for crop farming (NSSO, 2005).

Information adoption among farming community is widely acknowledged as one among the critical factors for effective agricultural decision making (Galloway and Mochrie, 2005; Rao, 2006). A prompt information dissemination system between research stations to end users and feedback from these end users is most needed. It is not possible for the present extension system to directly contact each and every farmer and to the independent livestock owners of remote areas. Thus an appropriate ICT initiative will provide a strong case for effective coverage and dissemination of livestock information to the farming community (Sasidhar and Sharma, 2006).

Now, an unconventional method is needed to transfer the knowledge of experts in this domain to the general public of livestock holders, especially that the number of experts in new technologies is lesser than their demand in a certain domain. The transfer of knowledge from veterinary experts to livestock holders represents a bottleneck for the development of animal health care in any country (Savithramma, 2011). Beside all ICTs, mobile phone has

increased the contact intensity and emerged as one of the widely accepted and adopted instruments in most parts of the world. It facilitates immediate access to up-to-date information and faster and easy communication between farmers and information providers (Ponnusamy, 2005). The agro-livestock sector is benefited more from mobile phones in the developing countries as it saves money, time and offers accurate advantage for farmers. It can be used to alert villagers about climate related health issues, various disease outbreaks, vaccination schedules, government schemes, insurance plans and other important livestock information well in time.

As such, mobile phones have been regarded as the widely accessed tool among the farmers for communication and also accessing agro-livestock related information. India has second largest number of smart phone users in the world having 220 million smart phone users including 80 million users in rural areas which shows the revolutionary insight of the country's agriculture growth capacity (Anonymous, 2016).

This telephone network can be used for delivering information to the farmers. Thus RTHS, a facility to get information related to animal husbandry over telephone, plays a significant role. RTHS addresses the need of the farming community making use of increased tele-density and Information Technology, making professional help and information available to livestock owners at their doorstep, on a telephone number, putting the livestock owners directly in contact with veterinary experts and making authentic field data available for animal husbandry policy decisions by the authorities.

Keeping the views of above facts and scenario and to provide prompt service to the farming community, Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), BIKANER has started TOLL FREE HELPLINE SERVICE (1800-180-6224) which was inaugurated by Hon'ble Governor of Rajasthan, Sh. Kalyan Singh ji on 16th November, 2016. The problem of livestock owner is resolved promptly through direct talks with concerned veterinary specialists. With the help of toll free service, each and every farmer from any corner of India can get the solution of their curiosity and doubts by talking to specialists and officials of RAJUVAS at anytime of twenty four hours. It responds more timely and in cost effective manner than any other

extension service to the queries related to animal husbandry, raised by farmers in local language. Queries related to Animal Husbandry are being addressed through TOLL FREE HELPINE (18001806224). During the office hours (8:00 A.M to 8:00 P.M) there will be an immediate response from the officials. While beyond office hours, the call is recorded and the queries are answered from the centre next day.

Since RTHS inception in November, 2016, RTHS has received thousands of telephonic calls related to animal husbandry from the livestock owners in all aspects; yet, No study was conducted specifically to assess its performance and prospects of RTHS and its impact on livestock owners. So, it was essential to understand and assess the services to the intended needs of its clients and also to ascertain their adoption, satisfaction, constraints and suggestions towards RTHS.

Keeping above facts and scenario in mind, the present investigation was carried out to study the “Performance and Prospects of Expert Advisory Services Rendered by RAJUVAS TOLL FREE HELPLINE (1800-180-6224) among Livestock owners of Rajasthan” with the following specific objectives.

1. To study the socio-economic profile of respondents
2. To study the categorization of queries of respondents received through RTHS
3. To measure the extent of adoption and level of satisfaction of respondents in terms of services received from RTHS
4. To measure the association between selected independent variables with dependent variables
5. To find out different constraints perceived and suggestions elicited by respondents to improve the performance of RTHS

The present investigation was purposefully carried out in Bikaner and Jaipur districts of Rajasthan, having maximum recorded telephonic calls during the period of six months (1 January 2017 to 30 June 2017). Ex-post facto research design was employed for conducting the study. The data were collected from both primary and secondary sources. Total recorded phone calls were collected from the record of IUMS (Integrated University

Management System), RAJUVAS, Bikaner in form of respondent's queries during last six months and treated as base of secondary data for further processing and analysis. Collected secondary data from IUMS, RAJUVAS, Bikaner were further categorized on the basis of different criteria such as queries wise, state wise, zone wise, district wise, month wise, case wise etc. From these collected phone calls, two districts (Bikaner and Jaipur) were purposively identified based on the highest number of telephonic calls received by RTHS during the period of six months. From each district, total 75 respondents were randomly selected to make a total sample size of 150 respondents for collection of primary data for research purpose.

Data were collected by using a structured schedule employing telephonic personal interview method. Departmental documents, records, reports, books, newspaper and other available literature were also consulted to collect secondary data on different parameters. The responses were scored, quantified, categorized, tabulated and analysed using statistical methods like Percentage, Mean, Standard Deviation, Frequencies and Correlation.

The major salient findings of the study are summarised as follows:

1. Majority (67.33%) of the respondents belonged to middle age group (25 to 50 years) followed by young age group (below 25 years) and old age group (above 50 years) with 27.33 and 5.33 per cent of respondents, respectively.
2. Total 94.66 per cent of the respondents were male, while 5.34 per cent of respondents belonged to female category.
3. Majority (61.33%)of respondents were graduate and above, while 28.66 per cent of the respondents studied upto secondary or higher secondary school followed by middle school (6.66%), primary school (2.66%) and 0.66 per cent were found illiterates.
4. A large number (63.33%) of the respondents had medium size (i.e. 5 to 8 members) of family followed by large size (above 8 members) and small size (upto 4 members) of family with 23.33 and 13.33 per cent of respondents, respectively.

5. Majority (74%) of respondents were living in joint family and sharing common kitchen and roof, while only 26 per cent of respondents had nuclear type of family.
6. Majority (83%) of the respondents had pucca type of houses followed by mixed type (10%) and katcha type (7%) of houses.
7. Animal husbandry along with agriculture was found major family occupation by 67.33 per cent of respondents. Only 2 per cent were engaged in animal husbandry alone, 30.67 per cent of respondents had private business and government job along with animal husbandry and agriculture.
8. A good number (34.66%) of respondents belonged to large land holding category followed by semi medium (20.67%), small (18.67%), medium (16%) and marginal (6%) land holding category whereas, 4 per cent respondents were landless.
9. About 80 per cent of respondents belonged to medium livestock holding category followed by large size (13.33%) and small size (7.34%) of livestock holding category.
10. All respondents (100%) had access to mobile phones whereas, 5.33 per cent of the respondents had access to both telephone and mobiles and none of the respondents was found to have telephone alone.
11. Majority (59.33%) of respondents belonged to medium group of mobile users (3 to 6 mobile users) whereas, 26 per cent of the respondents were reported small group of mobile users (less than 3 mobile users in a family). Only 14.67 per cent of respondents belonged to large group of mobile users (more than 6 mobile users in a family).
12. Majority (4.66%) of respondents reported family members whereas, 5.33 per cent of respondents reported fellow livestock owners/farmers as localite source for getting information about RTHS number (1800-180-6224).
13. As far as the cosmopolite channel was concerned, majority (42.66%) of the respondents reported KCC (Kisan Call Centre) as main cosmopolite source of respondents from where they gathered information about the

existence of RTHS, while radio and news paper were reported by 16.66 per cent and 13.33 per cent of respondents, respectively. This was followed by social media (8.66%), RAJUVAS (5.33%), animal husbandry department (2%) and livestock fairs (0.66%) conducted by State agricultural and animal husbandry department and television (0.66%).

14. Results pertaining to information sharing behaviour about existence of RTHS respondents indicated that majority (80.67%) of the respondents had shared source of information of RTHS (1800-180-6224) upto one person whereas, 18.67 per cent respondent shared information upto 3 persons. Only 0.67 per cent of respondents shared above 3 persons.
15. Great majority (60%) of respondents shared the advices recommended by RTHS upto 1 person in their locality followed by 26.67 per cent of the respondents who shared information upto 3 persons whereas, 13.33 per cent of the respondents shared advices more than 3 persons recommended by RTHS.
16. As far as frequency of contact at RTHS to get expert advice on particular problem related to animal husband was concerned, large proportion (68.67%) of the respondents had to call single time whereas, 26 per cent of respondents had to call twice. Only 5.33 per cent of respondents had to call thrice or more to get relevant information from RTHS.
17. Results pertaining to frequency of contact at RTHS to seek expert advice for their multiple queries related to animal husbandry from January-2017 to June-2017 revealed that majority (48%) of livestock owners called once whereas, 22 per cent of respondents called twice, 16 per cent of respondents called thrice and 14 per cent of respondents contacted more than thrice.
18. Results pertaining to state wise telephonic calls registered at RTHS revealed that majority (84.88%) of telephonic calls were made by the livestock owners of Rajasthan, occupied first rank followed by Haryana (2.86%), Uttar Pradesh (2.06%), Madhya Pradesh (1.68%), Delhi (1.68%) and Gujarat (1.60%) with 2^{nd}, 3^{rd}, 4^{th}, 4^{th} and 5^{th} rank, respectively. The least number of telephonic calls (0.02%) were made by livestock owners from Mizoram, Orissa, Goa and Tripura, occupied last 4 positions in order.

19. The telephonic calls made by the livestock owners to RTHS were analyzed district-wise. Results revealed that total 4232 telephonic calls registered at RTHS during January-2017 to June-2017 from 33 districts of Rajasthan. Among all districts, maximum number of telephonic calls were made by the livestock owners of Bikaner district (433) occupied first rank followed by Jaipur district (336) occupied 2nd rank. This was followed by the telephonic calls made from livestock owners of Hanumangarh (310), Sri Ganganagar (289) and Alwar district (266) occupied the next three positions in order. The least number of telephonic calls were made from the livestock owners from Pratapgarh (22), Sirohi (19), Banswara (17), Rajasamand (13) and Dungarpur (10) districts with 26th, 27th, 28th, 29th and 30th ranks, respectively.
20. Great majority (29.58%) of callers were from Bikaner division (Bikaner, Churu, Ganganagar and Hanumangarh districts) ranked first in Rajasthan while Jaipur division (Jaipur, Alwar, Sikar, Dausa and Jhunjunu districts) stood second with 24.03 per cent telephonic calls from Rajasthan and the least number of telephonic calls (4.46%) were made by Udaipur division (Udaipur, Chittorgarh, Rajasamand, Dungarpur, Banswara and Pratapgarh districts) ranked seventh in order whereas, Jodhpur, Ajmer, Bharatpur and Kota divisions occupied 3rd, 4th, 5th and 6th rank with 15.09, 10.18, 9.33 and 7.3 per cent of telephonic calls, respectively.
21. As far as query wise telephonic calls registered at RTHS was concerned, majority of telephonic calls (48.10%) were related to medicinal problems followed by livestock production and management related problems (17.65%), gynaecological problems (12.52%), animal feeding and nutritional problems (8.29%), dairy entrepreneurial and dairy marketing (6.37%) and animal genetics and breeding related problems (3.54%). However, the least telephonic calls were related to surgical problems (2.74%) and disease investigation and diagnosis related problems (0.75%).
22. Maximum number of telephonic calls were made in the month of January (17.77 %) and February (17.62%) followed by May (17.55%) and March

(17.36%). The least number of telephonic calls were made in the month of June (16.20%) and April (13.51%).

23. Great majority (56.67%) of respondents fully adopted advices whereas, 10 per cent partially adopted. About 33 per cent respondents not adopted advices provided by RTHS. However, overall per cent of adoption towards advices recommended by RTHS was 61.66 per cent.
24. Results pertaining to query wise adoption level of advice by respondents received from RTHS revealed that information on medicinal problems has maximum (65.34%) adoption level occupied first rank followed by animal production and management related practices (60%), gynaecological problems (58.82%), animal feeding and nutrition problems (50%), information on dairy entrepreneurial and dairy marketing related queries (44.44%) and surgical problems (33.33%) with 2^{nd}, 3^{rd}, 4^{th}, 5^{th} and 6^{th} rank, respectively.
25. Large number (68.67%) of respondents were highly satisfied whereas, 9.33 per cent respondents were satisfied. 22 per cent respondents were not satisfied towards expert advices as per received from RTHS. However, overall extent of satisfaction level towards advices recommended by RTHS was 73.33 per cent.
26. Results pertaining to satisfaction level of respondents towards overall service of RTHS revealed that respondents showed their highest satisfaction (91.33%) towards behaviour of veterinary experts followed by 90.66 per cent of satisfaction for knowledge competency of RTHS expert, 89 per cent of satisfaction towards problem solving competency of expert, 88 per cent of satisfaction for behaviour of RTHS technical personnel, 87.66 per cent of satisfaction towards accessibility of RTHS officials/experts, whenever respondents seek help, 86.33 per cent of satisfaction towards language competency of expert advices in terms of language and technical terminology used by experts.
27. However, respondents reported 85.33 per cent of satisfaction towards working hours of RTHS followed by pick up the telephonic calls by RTHS officials (84.33%), conversation duration of call (83.33%), relevancy of

expert advice towards farmer's query (81.33%) and competency of experts in promptness of reply (81%).

28. Results also revealed that respondents showed 86.21 per cent of overall satisfaction towards service of RTHS.
29. Results pertaining to query wise satisfaction level revealed that advices related to medicinal problems has maximum (80.20%) satisfaction level occupied first rank followed by livestock production and management problems (63.33%), gynaecological problems (61.76%), animal feeding and nutritional problems (60%) and dairy entrepreneurial and dairy marketing problems (50%) with 2nd, 3rd, 4th and 5th rank, respectively. However, satisfaction level towards surgical problems was low (33.33%) and ranked sixth.
30. Results indicated that education and family type had positive and significant relationship with adoption at 1 per cent level of significance whereas, family size had positive and significant relationship with adoption of advice at 5 per cent level of significance. Various independent variables like occupation, livestock holding and number of mobile consumers in family were positively correlated, while age and sex of respondents were negatively correlated and had not significant relationship with adoption level.
31. Satisfaction was positively correlated with their education, family size, family type, occupation, livestock holding and number of mobile consumers in family. Age and sex were negatively correlated with satisfaction level of respondents towards RTHS. Family type of respondents had positively significant relationship with satisfaction.
32. As far as constraints perceived by respondents was concerned, it was revealed that lack of detail information on loan, insurance and various subsidiary governmental schemes was the major constraint occupied first rank followed by delay in call reply, short duration of permitted call and delay in pickup of call at RTHS were other major constraint in the constraint series with 2nd, 3rd and 4th rank, respectively whereas, language barrier between expert and respondents, accessibility of expert on call, call not attended during holidays, behaviour of technical person, frequently

engaged RTHS call system and incompetency of RTHS expert to satisfy farmer query were minor constraints.

33. Results pertaining to suggestions elicited by respondents for further improvement of overall service of RTHS revealed that majority of respondents (52%) suggested need to provide detail Information on various subsidiary loan schemes and insurance and was ranked first followed by call duration should be increased (43.33%), call should be picked up more timely and promptly (40%), along with voice facility, text message facility should be provided (33.33%), problem of call engage should be resolve (30%), advice should be simple and in local language (26.66%) and advice should be relevant and useful for livestock owners (23.33%). However, RTHS facility should be accessible on holiday also was elicited by least number of respondents (20.66%) and was ranked eighth, last rank in all suggestions whereas, 20 per cent of respondents did not express any suggestion towards service of RTHS.

Conclusions:

1. Findings concluded that most of the respondents were educated and effectively utilised mobile communication technology as a media to contact at RTHS.
2. Study further concluded that majority of respondents were found engaged with agriculture along with animal husbandry as their major family occupation and KCC as cosmopolite whereas, fellow farmers as localite were major source of information about existence of RTHS.
3. Findings concluded that majority of respondents shared information of existence of RTHS and advice recommended by RTHS experts to other livestock owners also. Thus, it is advantageous for diffusion of information about existence of RTHS. It would be indicated that in future RTHS would be more beneficial to needy farmers to solve their problems.
4. Findings concluded that majority of telephonic calls received at RTHS were belonged to clinical problems. In clinical cases, livestock owners seek prompt expert advice/treatment or intervention by RTHS experts. RTHS played a crucial role in prompt delivering of expert advice to needy farmer’s located rural remote area as well as urban area.

5. Results revealed that majority of respondents adopted the advices recommended by RTHS and majority of them were satisfied with overall service of RTHS. Thus, it is concluded that respondents were tremendously benefitted with services received from RTHS.

Implications and recommendations:

The present investigation had brought out some important implications and recommendations as following:

1. The socio-economic profile of livestock owners, constraints perceived and suggestions elicited by them should be given due consideration while formulating any strategy and model to improve the functioning of RTHS and overall services to farmer's community.
2. The present study has spotted the region/districts/areas of state Rajasthan from where minimum telephonic calls were registered. So it was recommended that proper extension strategy should be developed with the help of other units of RAJUVAS (LRS, VUTRC, KVK etc.) located in or adjoining regions of these districts for creating awareness about RTHS among livestock owners so that they may also benefitted with RTHS. Government officials like veterinary doctors, agriculture officers, assistant agricultural officers, block development officers and District Rural Development Agencies should also take immediate steps in creating awareness among farmers during the time of farm meetings, farm demonstrations, farmers training and other means. It would popularize RTHS among farmers.
3. Women were closely associated with routine animal husbandry practices. They were more aware about livestock disease and symptoms associated with them. Thus, their information regarding animal disease and other aspect were more useful for veterinary expert for proper diagnosis of disease and suggestions for treatment. Findings revealed that male respondents more frequently communicated at RTHS as compare to female. Thus, finding implies that females should be given due consideration in terms of education and use of information and

communication technology. Findings recommended that government should give more emphasis on women education, women empowerment and trainings related to use of communication technology, so that they can fully utilise the available toll free services in their surroundings and directly communicate with call centre for seeking suggestions for agro-livestock problems

4. Call was not picked up or call busy was one of the problems, might be due to so many callers at RTHS at the same time. It could be recommended that to establish multiple parallel tele-lines so that number of telephonic calls can be attended at the same time to provide advice to much more farmers.
5. It could be recommended that conversation call duration should be increased from existing time (i.e. 4 minutes) for proper and complete conversation without interruption between livestock owners and RTHS team.
6. No doubt RTHS served as prompt communication channel between farmer and experts. Results also revealed that majority of respondents show more satisfaction towards different aspect of RTHS mobile advisory services delivered by RTHS. Thus, there is need to more strengthening the service with consideration of respondent's constraints, so that effective service can be communicated to the farmers.
7. Most of the farmers were more educated and they were also aware about ongoing government schemes and entrepreneurial aspect of livestock management policies. Besides this they also showed their interest in other aspect such as agriculture, fishery etc. So study recommended on above facts that RTHS should develop their linkage with similar type of parallel toll free advisory services such as KCCs, so that RTHS would be able resolve and make solution of queries other than animal husbandry practices.

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Performance and Prospects of Expert Advisory Services Rendered by RAJUVAS TOLL FREE HELPLINE (1800-180-6224) among Livestock Owners of Rajasthan

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Veterinary and Animal Husbandry Extension
Department of Veterinary and Animal Husbandry Extension Education
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ABSTRACT

The present study "Performance and Prospects of Expert Advisory Services Rendered by RAJUVAS TOLL FREE HELPLINE (1800-180-6224) among Livestock Owners of Rajasthan" was carried out to evaluate impact of RTHS on livestock owners in terms of adoption of recommended practices and satisfaction towards overall services provided by RTHS with aim to make effective communication linkage between extension functionaries (veterinary experts) and livestock owners and to facilitate the policymakers, academicians and administrators to take appropriate measures to improve the functioning of RTHS and overall services to farmers' community. Study also documented constraint perceived and suggestions elicited by respondents. Rajasthan University of Veterinary and Animal Sciences (RAJUVAS), BIKANER has started RAJUVAS TOLL FREE HELPLINE SERVICE (1800-180-6224) on 16th November, 2016 to provide prompt service to the farming community.

Study was purposively carried out in state Rajasthan. Total registered telephonic calls were collected from the record of IUMS (Integrate University Management System), RAJUVAS, Bikaner in form of respondent's queries from 1 January-2017 to 30 June-2017 and treated as base of secondary data for further processing and analysis. Two districts, Bikaner and Jaipur were purposively selected having maximum recorded telephonic calls. Total 75 respondents from each district were randomly selected to make total sample

size of 150**.** Respondents were personally contacted through telephonic interview schedule to collect required data for further research which served as base for primary data. The study revealed that majority of the respondents belonged to middle age group, were male, graduate and above, having medium size (5 to 8 members) of family, joint family, pucca house, animal husbandry with agriculture as major family occupation, large land holding (more than 10 hactares), medium livestock holding, medium category (3 to 6 mobile users in family) of mobile users and all respondents had mobiles phones whereas, only 5.33 per cent of them were found to have mobile and telephone both.

Majority of them reported friends as localite whereas, KCC as cosmopolite source from where they came to know about existence of RTHS. Majority of them shared information about toll free and advice recommended by RTHS to others. Bikaner and Jaipur received maximum telephonic calls in state Rajasthan whereas, maximum queries were registered in months of January and February. Most of the queries were related to medicine and livestock production and management. Respondents reported maximum adoption and satisfaction level towards medicinal problems as well as livestock production and management related problems. Majority of them were satisfied with behaviour of veterinary experts, knowledge competency and problem solving competency of veterinary experts. Education, family size, family type, occupation, livestock holding and number of mobile consumers in family were positively correlated whereas, age was negatively correlated with adoption and satisfaction. Majority of them reported lack of detail information on loan, insurance and various subsidiary governmental schemes, delay in call reply and short duration of call as major constraints whereas, most them suggested need to provide detail Information on dairy entrepreneurship and marketing and to increase call duration for better conversation.

राजस्थान के पशुपालकों में राजुवास टोल फ्री हेल्पलाइन (1800-180-6224) द्वारा प्रदत विषय विशेषज्ञ सलाहकार सेवाओं का कार्य संपादन एवं संभावनाएं

पशु चिकित्सा और पशुपालन प्रसार शिक्षा विभाग,
पशु चिकित्सा एवं पशु विज्ञान महाविद्यालय, बीकानेर
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मुख्य समादेष्टा : डॉ. देवीसिंह राजपूत

अनुक्षेपण

वर्तमान अध्ययन " राजस्थान के पशुपालकों के बीच राजूवास टोल मुक्त हेल्पलाइन (1800-180-6224) द्वारा प्रदान किए गए विशेषज्ञ सलाहकार सेवाओं का कार्य संपादन एवं संभावनाएं" अनुशंसित प्रथाओं और संतुष्टि को अपनाने के मामले में पशुधन मालिकों पर आरटीएचएस के प्रभाव का मूल्यांकन करने के लिए तथा विस्तार कार्यकर्ताओं (पशु चिकित्सा विशेषज्ञों) और पशुधन मालिकों के बीच प्रभावी संचार लिंकेज बनाने के उद्देश्य के साथ आरटीएस द्वारा प्रदान की गई समग्र सेवाओं की ओर और नीति निर्माताओं, शिक्षाविदों और प्रशासकों को किसानों के समुदाय के लिए आरटीएचएस और समग्र सेवाओं के कामकाज में सुधार करने के लिए उचित उपाय करने के लिए किया गया था। अध्ययन ने उत्तरदायी लोगों द्वारा प्राप्त बाध्यता और सुझावों को भी प्रलेखित किया। राजस्थान विश्वविद्यालय के पशु चिकित्सा और पशु विज्ञान (राजूवास), बीकानेर ने 16 नवंबर, 2016 को कृषि समुदाय को शीघ्र सेवा प्रदान करने के लिए राजूवास टॉलिफरी हेल्पलाइन सेवा (1800-180-6224) शुरू की है।

अध्ययन राजस्थान राज्य में किया गया था। कुल पंजीकृत फोन कॉल 1 जनवरी-2017 से 30 जून-2017 तक प्रतिवादी के प्रश्नों के रूप में आईयूएमएस (एकीकृत विश्वविद्यालय प्रबंधन प्रणाली), राजूवास, बीकानेर के रिकॉर्ड से एकत्र किए गए थे और आगे की प्रक्रिया और विश्लेषण के लिए माध्यमिक डेटा के आधार के रूप में माना गया। दो जिलों, बीकानेर और जयपुर को अधिकतम दर्ज कॉलों के आधार पर चयन किया गया था। प्रत्येक जिले से कुल 75 उत्तरदाताओं को क्रम रहित ढंग से 150 का कुल नमूना आकार बनाने के लिए चुना गया। उत्तरदायित्वों को व्यक्तिगत रूप से टेलीफोनी साक्षात्कार कार्यक्रम के माध्यम से संपर्क किया गया ताकि आगे के शोध के लिए आवश्यक डेटा एकत्र किया जा सके जो प्राथमिक डेटा के लिए आधार के रूप में काम करता था। अध्ययन से पता चला है कि अधिकांश उत्तरदाताओं में मध्यम आयु वर्ग के, पुरुष, स्नातक और उपर्युक्त, परिवार के मध्यम आकार (5 से 8

सदस्य), संयुक्त परिवार, पक्के घर, परिवार के प्रमुख व्यवसाय के रूप में कृषि के साथ पशुपालन, बड़ी भूमि धारण (10 से अधिक हाक्टर्स), मध्यम पशुधन धारण, मध्यम श्रेणी मोबाइल उपभोक्ताओं की धारण (परिवार में 3 से 6 मोबाइल उपयोगकर्ता) और सभी उत्तरदाताओं में मोबाइल फोन थे, जबकि उनमें से केवल 5.33 प्रतिशत मोबाइल और टेलीफोन दोनों ही पाए गए थे।

उनमें से अधिकांश लोगों के लिए मित्रों के रूप में स्थानीय स्रोत थे जबकि केसीसी के रूप में कॉस्मोपॉलिट स्रोत थे जहां से उन्हें □रटीएचएस के अस्तित्व के बारे में पता चला। उनमें से अधिकांश अन्य लोगों के लिए टोलफ्री के बारे में जानकारी और □रटीएचएस द्वारा सुझाए गए सलाह के बारे में जानकारी साझा करते थे। बीकानेर और जयपुर से राज्य राजस्थान में अधिकतम कॉल्स मिली जबकि अधिकतम कॉल्स जनवरी और फरवरी के महीने में पंजीकृत किए गए। अधिकांश प्रश्न पशु चिकित्सा और पशुधन उत्पादन और प्रबंधन से संबंधित थे। उत्तरदायियों ने औषधीय समस्याओं के साथ-साथ पशुधन उत्पादन और प्रबंधन संबंधी समस्याओं के बारे में अधिकतम अपनाने और संतुष्टि स्तर की सूचना दी। उनमें से अधिकांश पशु चिकित्सा विशेषज्ञों की ज्ञान की योग्यता और पशु चिकित्सा विशेषज्ञों की समस्याओं को सुलझाने की योग्यता के व्यवहार से संतुष्ट थे। शिक्षा, पारिवारिक □कार, परिवार के प्रकार, व्यवसाय, पशुधन धारण और परिवार में मोबाइल उपभोक्ताओं की संख्या सकारात्मक रूप से, जबकि उम्र नकारात्मक रूप से अपनाने और संतुष्टि से संबंधित थी। उनमें से अधिकांश ने ऋण, बीमा और विभिन्न सहायक सरकारी योजनाओं बारे में विस्तृत जानकारी की कमी, कॉल में देरी और कॉल की कम अवधि को बड़ी बाधाओं के रूप में मिली, जबकि ज्यादातर लोगों ने डेयरी उद्यमिता और डेयरी विपणन के बारे में विस्तार से जानकारी प्रदान करने और कॉल की अवधि बढ़ाने के लिए सुझाव दिया था।

DEPARTMENT OF VETERINARY AND ANIMAL HUSBANDRY
EXTENSION EDUCATION
COLLEGE OF VETERINARY AND ANIMAL SCIENCE

RAJASTHAN UNIVERSITY OF VETERINARY AND ANIMAL SCIENCES, BIKANER (RAJASTHAN) -334001

INTERVIEW SCHEDULE

Performance and Prospects of Expert Advisory Services Rendered by RAJUVAS TOLLFREE HELPLINE (1800-180-6224) among Livestock Owners of Rajasthan

Respondent Number:

Date of query:

Name:

District:

Nature of query:

1. Socio-economic profile of respondents

1.1. Age..... (In completed years)

1.2. Sex Male (1)..... Female (2).....

1.3. Education status

a) Illiterate (0)

b) Primary (1)

c) Middle (2)

d) Secondary or Higher secondary (3)

e) Graduate or above (4)

1.4. Family size .....(total members)

1.5. Family type

Nuclear (1)..... Joint (2).....

1.6. Type of house

Katcha (1).....Pucca (2).....Mixed (3).....

1.7. Family occupation

a) Animal husbandry (1)

b) Animal husbandry + Agriculture (2)

c) Animal husbandry + Agriculture+ Labours (3)

d) Animal husbandry + Agriculture +Service (4)
(Private/Government)

1.8. Land holding

Landless (No land) (1)

Marginal (<1 hectare) (2)

Small (1-2 hectare) (3)

Semi Medium (2-4 hectare) (4)

Medium (4-10 hectare) (5)

Large (>10 hectare) (6)

1.9. Livestock holding

Cattle ..... Buffalo.....

Sheep..... Goat.....

Dog..... Pig.....

Camel..... Horse.....

Donkey..... Poultry.....

1.10. Accessibility to telephone/mobile or both

Do you have Telephone/mobile facility at your home?

Yes..... No.....

If yes, than please indicate accessibility

Telephone (1)

Mobile (2)

Telephone and mobile both (3)

1.11. Number of mobile users in family.....(Total users)

Category	**Score**
Small (below 3 mobile users)	1
Medium (3 to 6 mobile users)	2
Large (above 6 mobile users)	3

2. Information and communication pattern

2.1. Source of information

How did you come to know about RTHS? Let me know from whom you get source of information about RTHS?

Type of source	Source of information	Score
A. Localite source	Family members	1
	Fellow farmers	2
B. Cosmopolite source	Kisan Call Centre (KCC)	3
	Radio	4
	News paper	5
	Social media (Facebook, Watsapp etc.)	6
	RAJUVAS	7
	Television	8
	Animal husbandry department	9
	Animal fair	10

2.2. Information Sharing Behaviour

2.2.1. Do you share about existence of RTHS (1800-180-06224) to other livestock owners?

Yes..... No.....

If yes, than up to which extent you shared the source of RTHS (1800-180-6224) to other livestock owners?

S. No.	Extent of Information sharing	Sharing about RTHS (1800-180-6224)
1.	Up to one person	1
2.	Up to 3 person	2
3.	Above 3 Person	3

2.1.2. Do you share recommended advice received from expert to other livestock owners?

Yes..... No.....

If yes, than up to which extent you shared the recommended expert advice to other livestock owners?

S. No.	Extent of advice sharing	Sharing about recommended advice to others
1.	Up to one person	1
2.	Up to 3 person	2
3.	Above 3 Person	3

2.2. Frequency of contact at RTHS

2.3.1. How many times you have called at RTHS to seek solution for particular query related to animal husbandry?

S. No	Frequency of contact	Response
1	Once	1
2	Twice	2
3	Thrice and above	3

2.3.2. How many times you have contacted at RTHS from January-2017 to June-2017 for solution of your queries related to animal husbandry?

S. No	Frequency of contact	Response
1.	Once	1
2.	Twice	2
3.	Thrice	3
4.	More than thrice	4

3. Adoption and Satisfaction level

3.1. Adoption level

Did you adopt the advice received from RTHS?

Yes..... No.....

If yes, than please indicate up to which extent you have adopted the expert advice?

S .No.	Extent of adoption	Score
1.	Fully adopted	2
2.	Partially adopted	1
3.	Not adopted	0

3.2. Satisfaction level

Are you satisfied from expert advice received from RTHS?

Yes..... No.....

If yes, than please indicate up to which extent you satisfied from expert advice?

S .No.	Extent of satisfaction	Score
1.	Highly satisfied	2
2.	Satisfied	1
3.	Not satisfied	0

3.3. Extent of satisfaction towards overall service offered by RTHS

Please indicate up to which extent you satisfied with the following statements?

S. No.	Statements	Highly Satisfied (2)	Satisfied(1)	Not Satisfied(0)
1.	Behaviour of RTHS technical person			
2.	Behaviour of experts			
3.	Knowledge competency of experts			
4.	Problem solving competency of experts			
5.	Accessibility of experts on telephonic calls			
6.	Language competency of experts			
7.	Working hours of RTHS			
8.	Conversation duration of telephonic calls			
9.	Competency of experts in promptness of reply			
10.	Pick up the telephonic calls by RTHS officials			
11.	Relevancy of expert advice towards farmers query			

4. Constraints and Suggestion

4.1. Constraints perceived by respondents:

Let me know the seriousness of the following constraints perceived by you towards RTHS.

S. No.	Constraint	Highly serious (2)	Serious (1)	Not serious (0)
1.	Accessibility of experts on telephonic calls			
2.	Telephonic calls not attended during holidays			
3.	Behaviour of technical personnel			
4.	Lack of detail information on loan, insurance and governmental subsidiary schemes			
5.	Incompetency of RTHS experts to satisfy farmer query			
6.	Language barrier between experts and respondents			
7.	Delay in telephonic calls reply			
8.	Delay in pickup of telephonic calls			
9.	Frequently engaged RTHS telephonic calls system			
10.	Short duration of permitted telephonic calls			

4.2. What are the suggestions you would like to offer to make RTHS service better and efficient for livestock owner?

1.

2.

3.

4.

5.

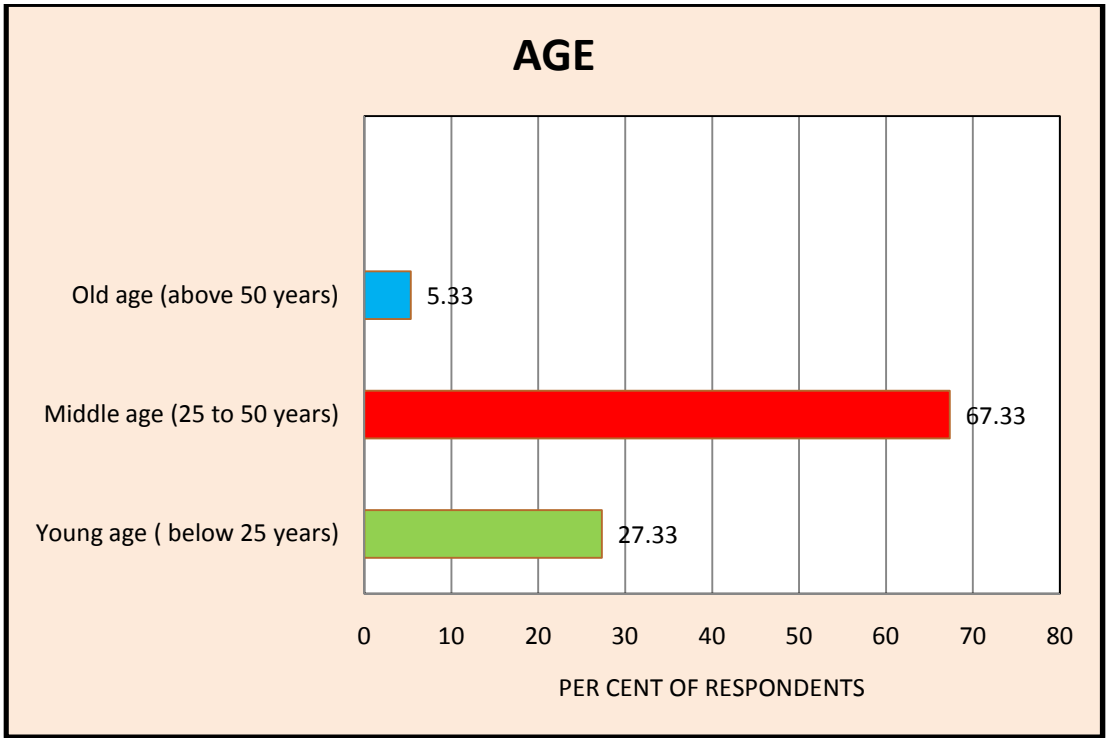

Fig.7: Diagrammatic representation of respondents according to their age

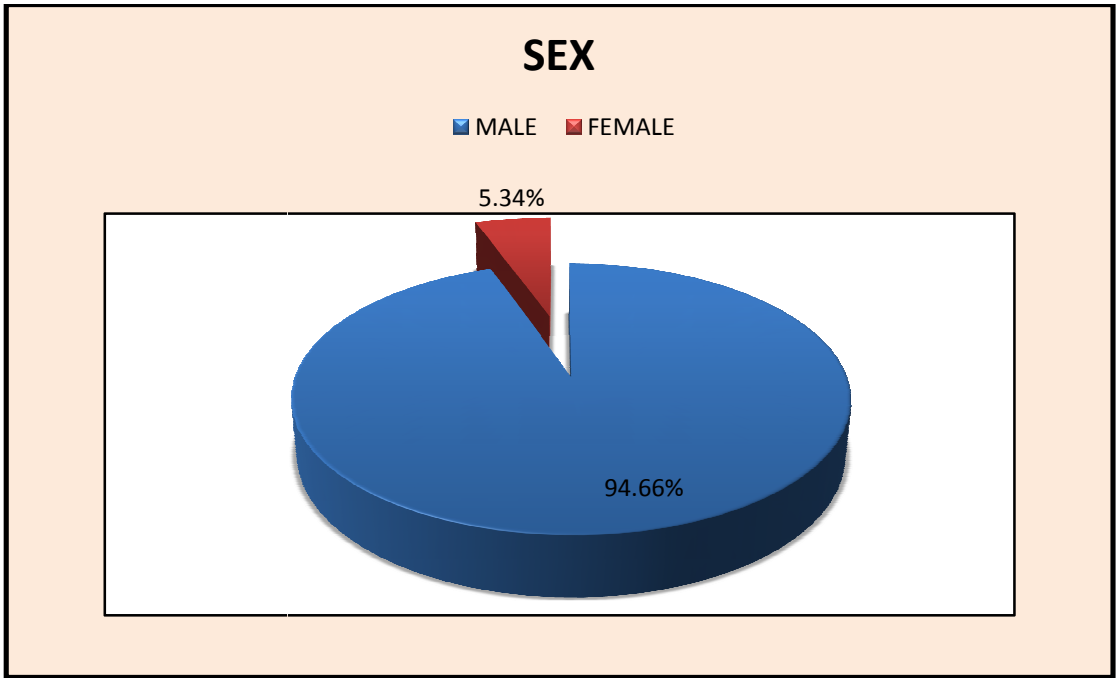

Fig.8: Diagrammatic representation of respondents according to their sex

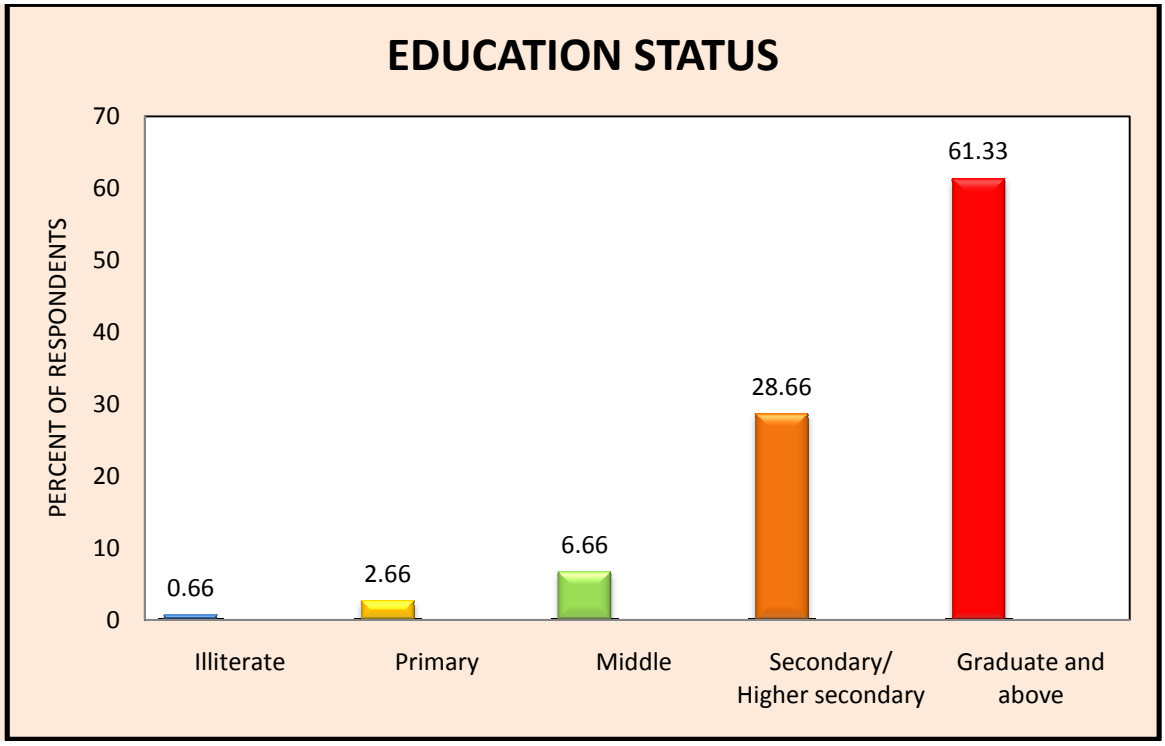

Fig.9: Diagrammatic representation of respondents according to their education status

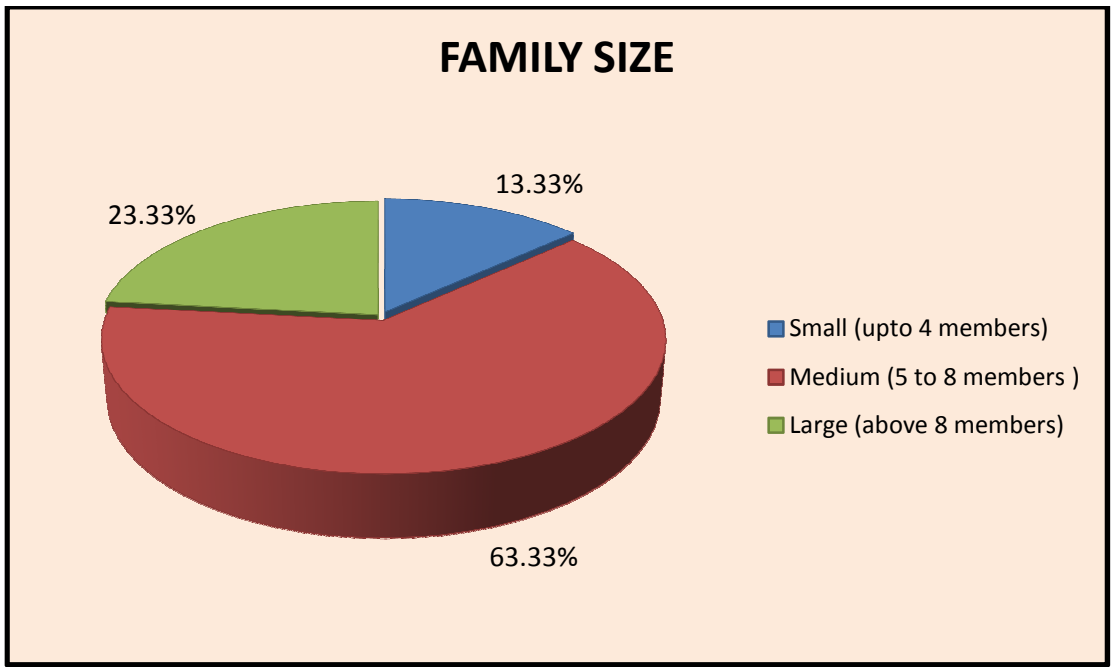

Fig.10: Diagrammatic representation of respondents according to their family size

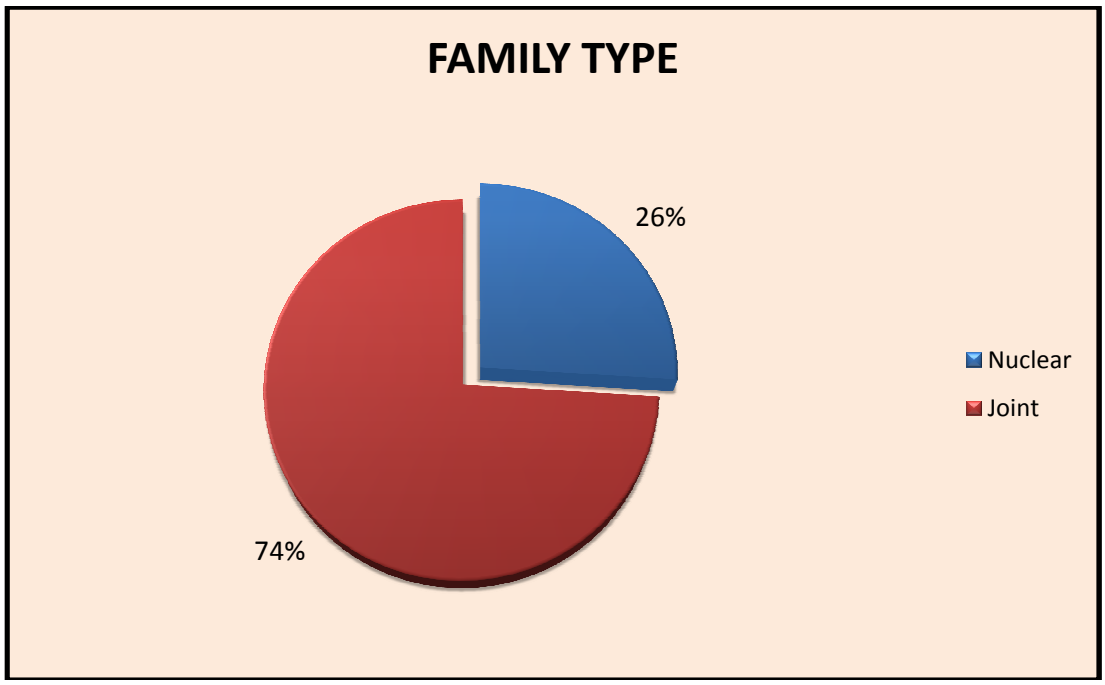

Fig.11: Diagrammatic representation of respondents according to their family type

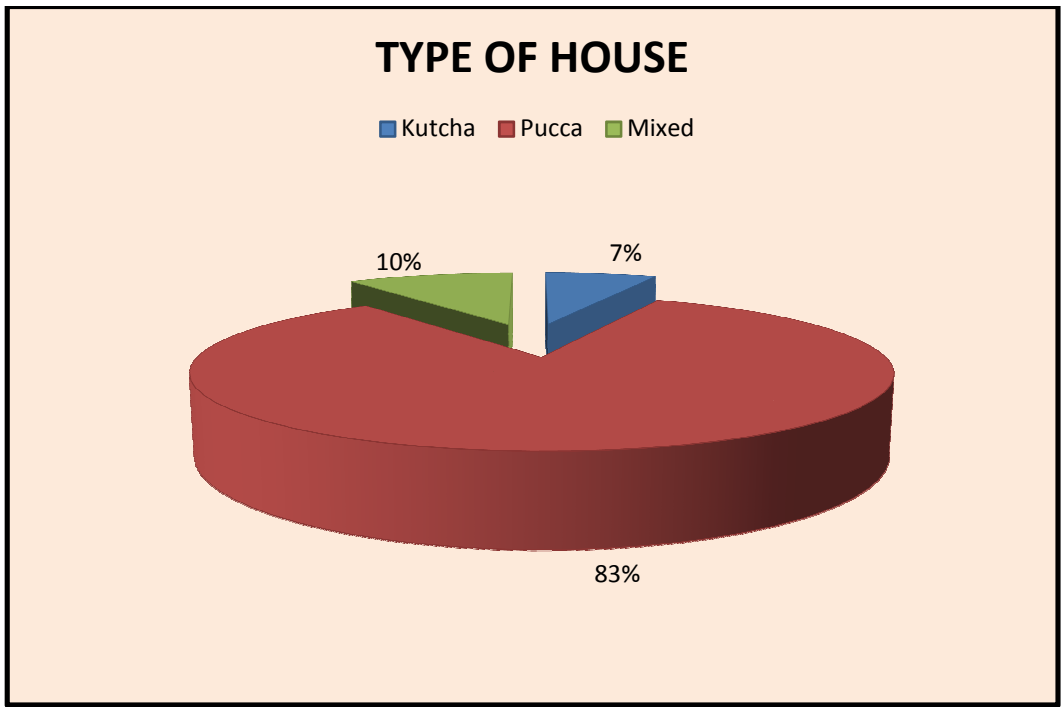

Fig.12: Diagrammatic representation of respondents according to their type of house

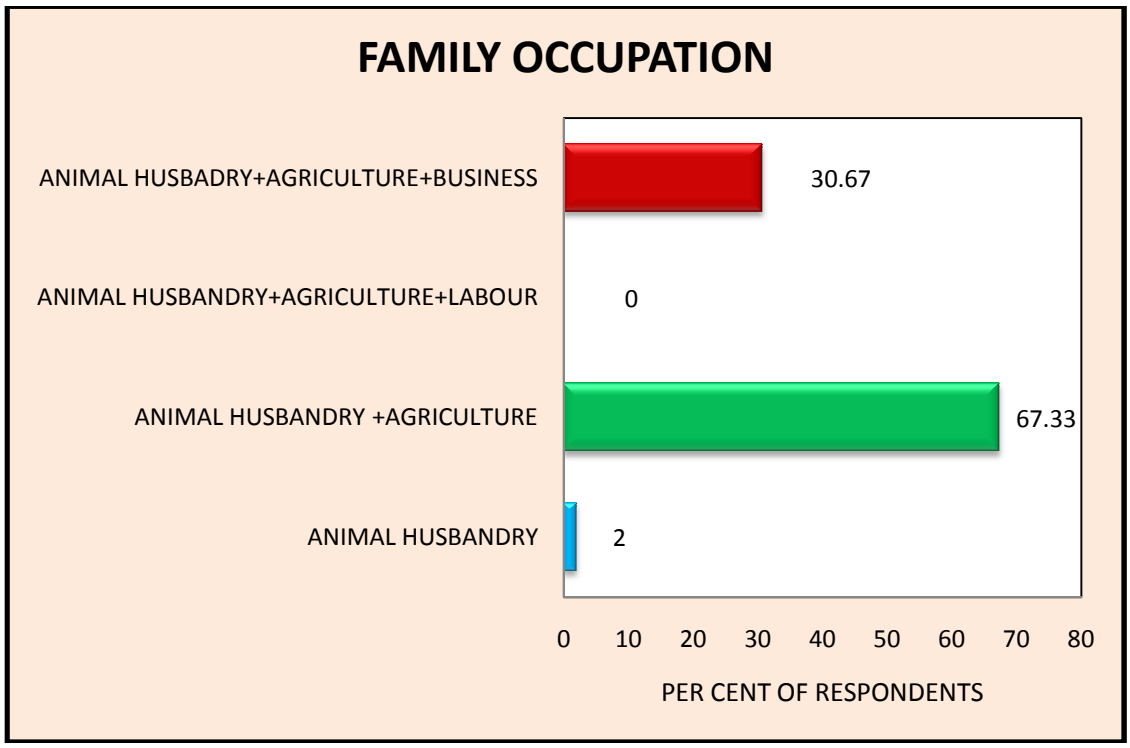

Fig.13: Diagrammatic representation of respondents according to their family occupation

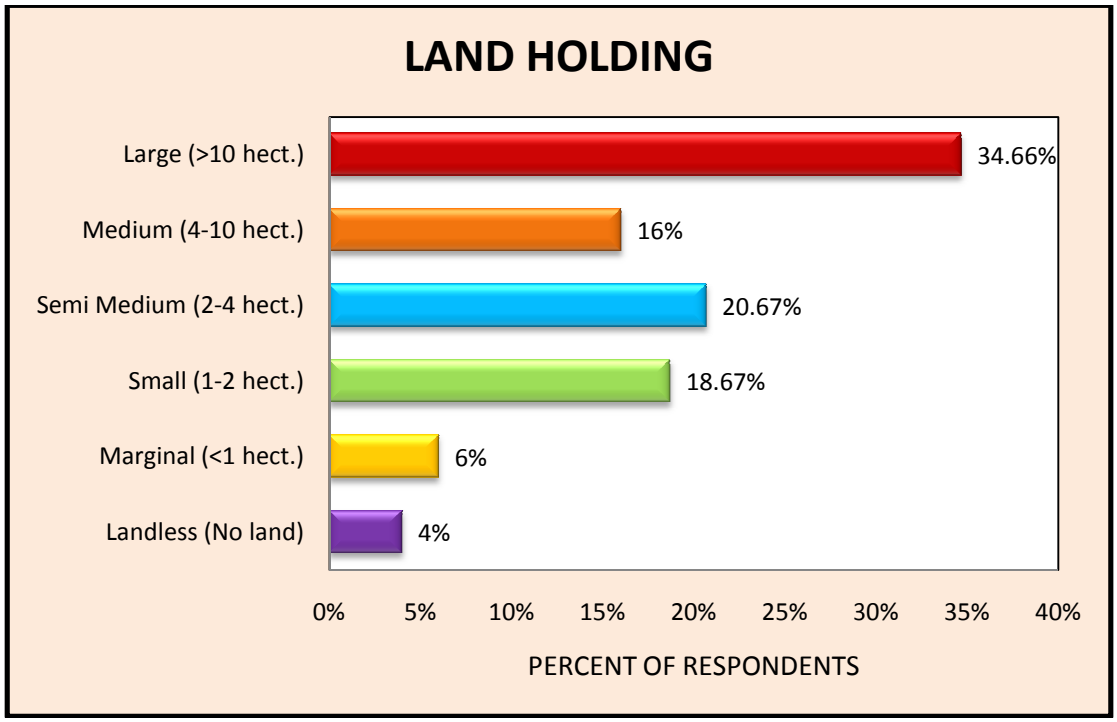

Fig.14: Diagrammatic representation of respondents according to their land holding

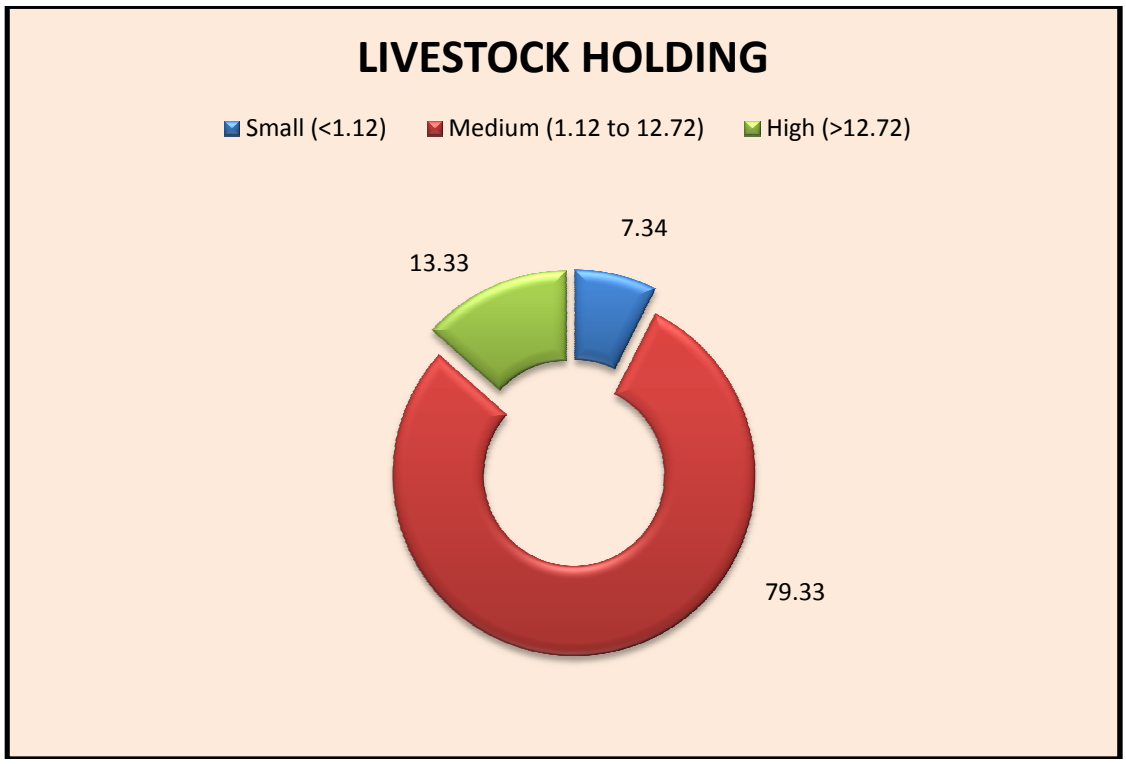

Fig.15: Diagrammatic representation of respondents according to livestock holding

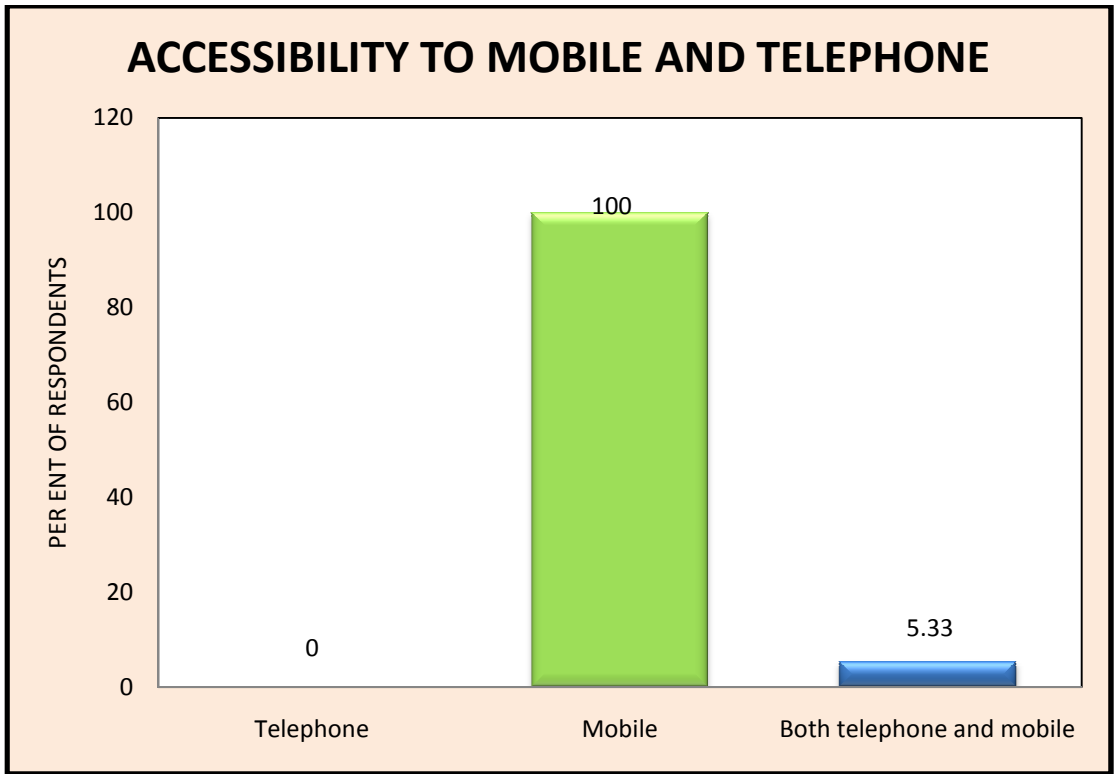

Fig.16: Diagrammatic representation of respondents according to their accessibility to telephone and mobile

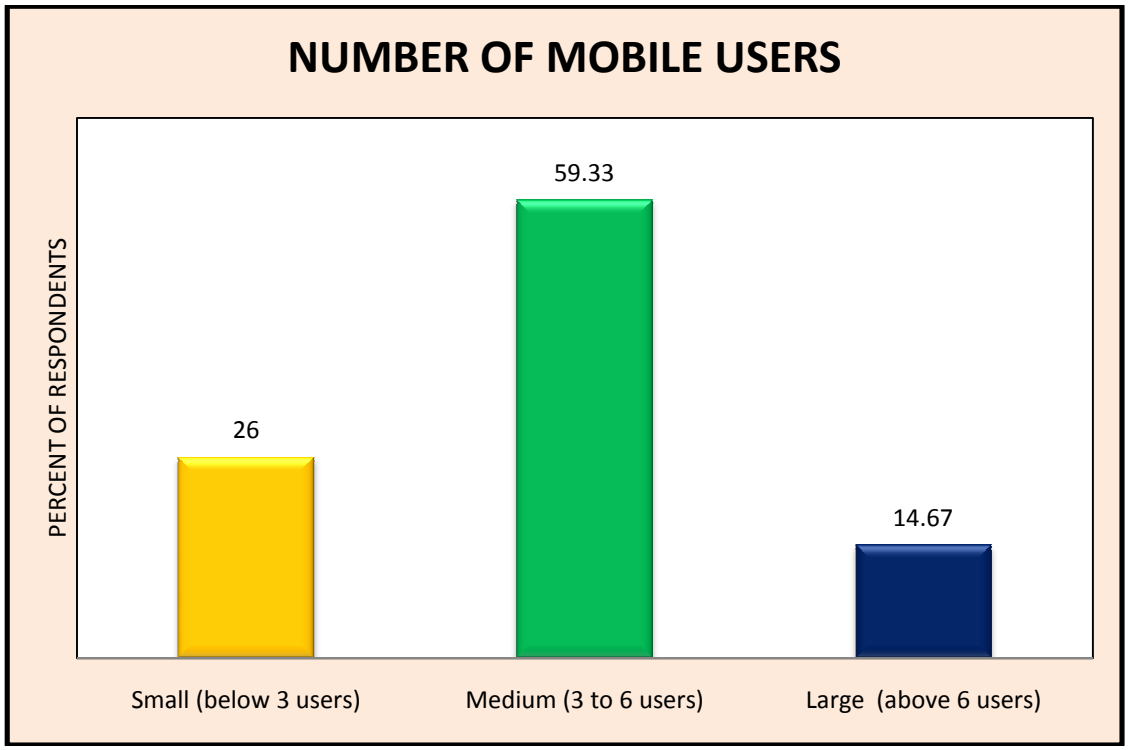

Fig.17: Diagrammatic representation of respondents according to number of mobile users in their family

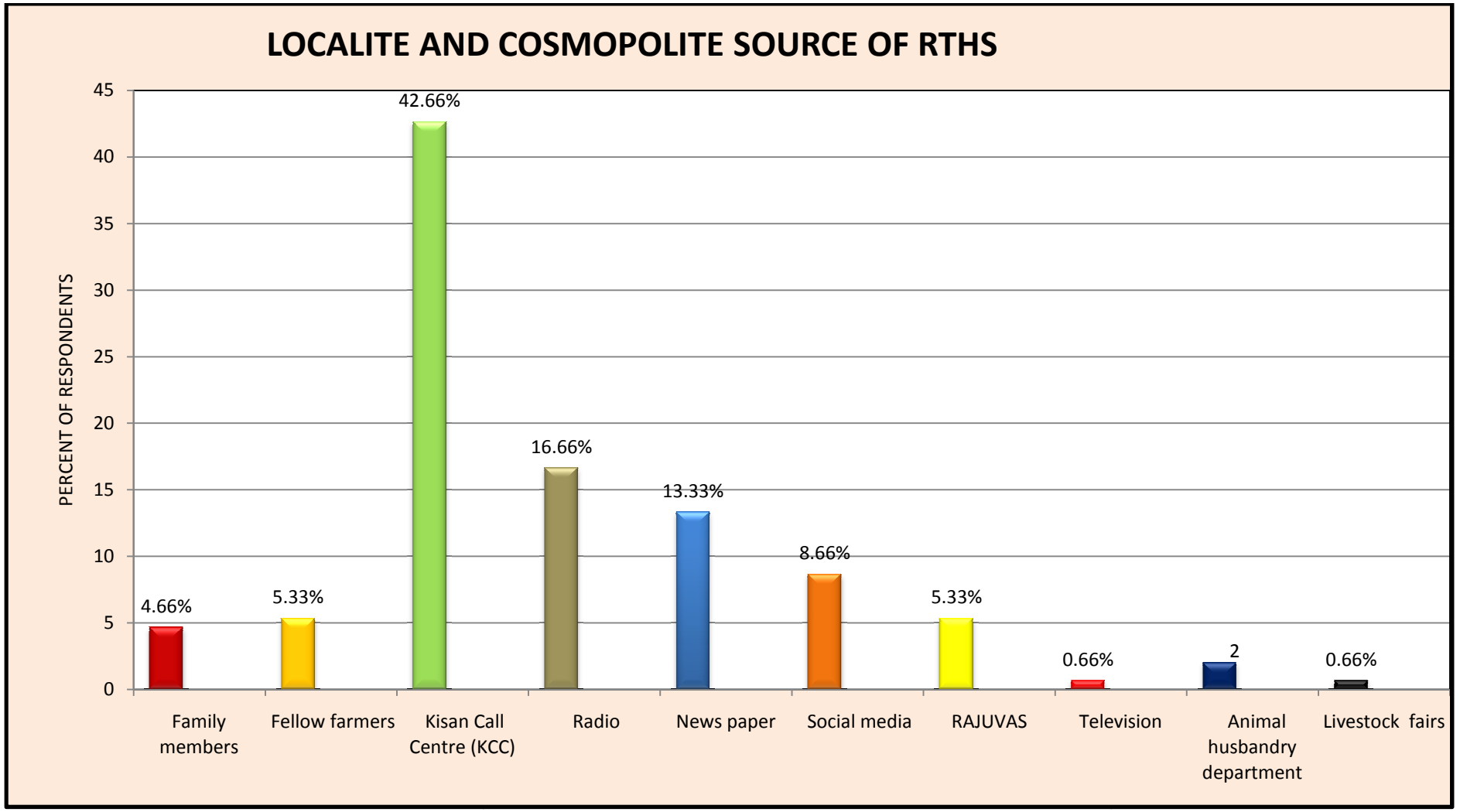

Fig.18: Diagrammatic representation of respondents according to their localite and cosmopolite source of RTHS

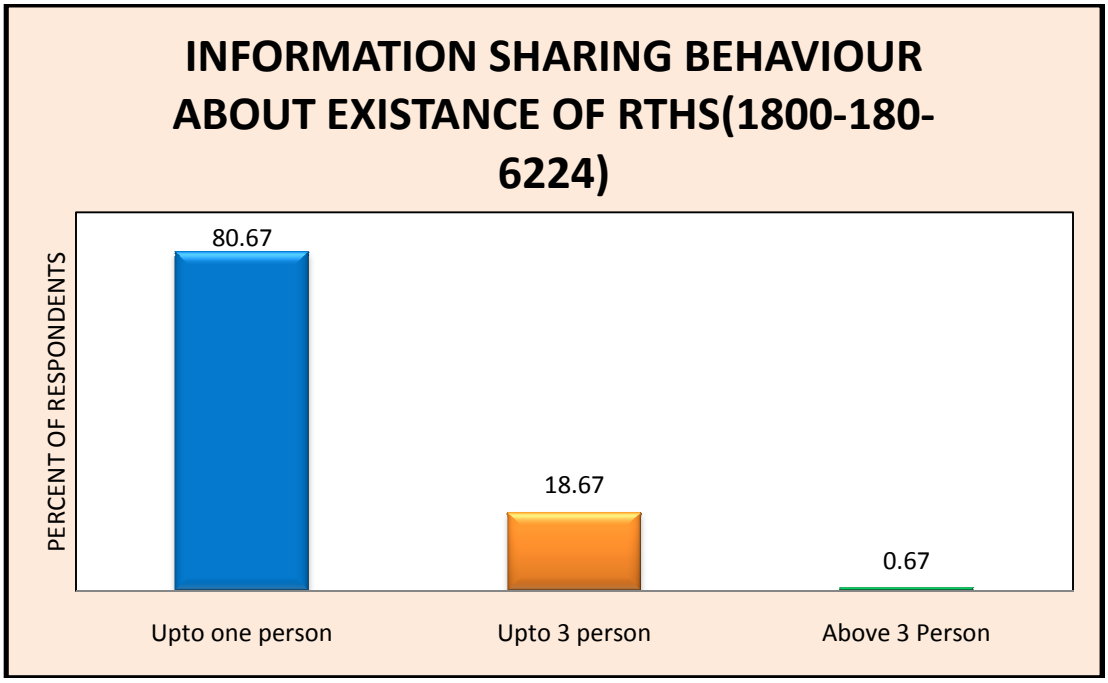

Fig.19: Diagrammatic representation of respondents according to sharing of information about existence of RTHS (1800-180-6224)

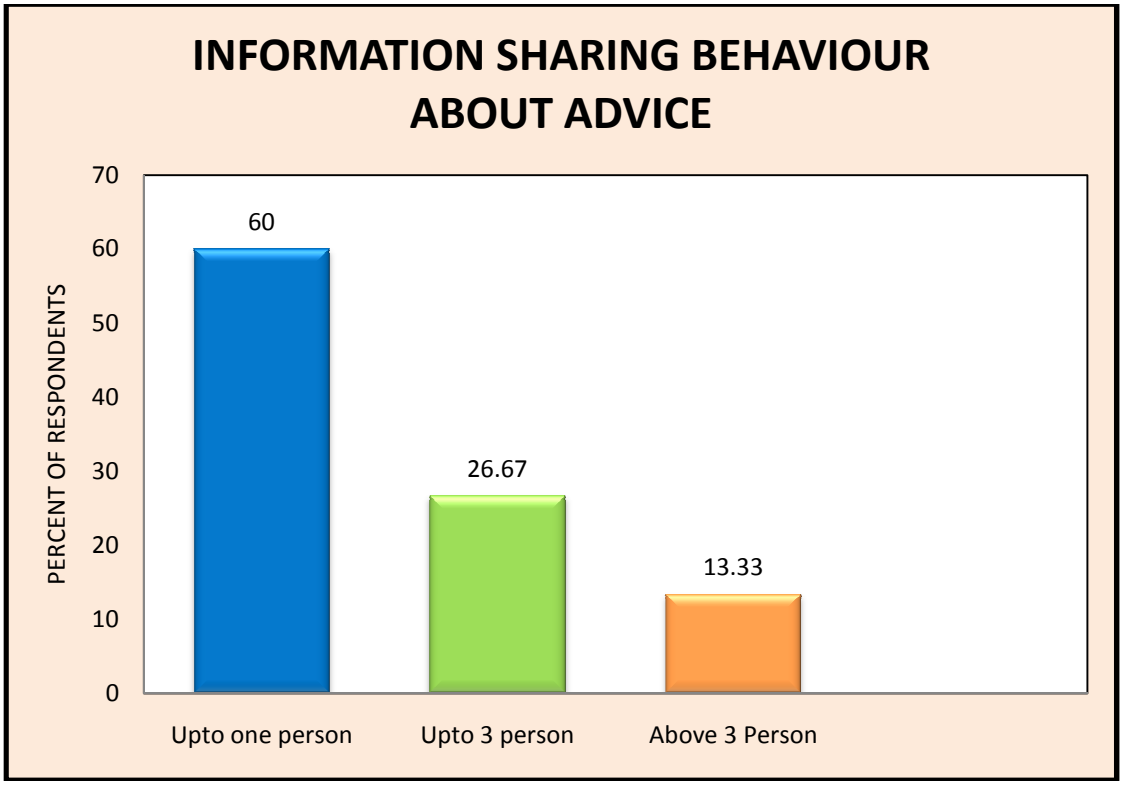

Fig.20: Diagrammatic representation of respondents according to sharing of advice to other livestock owners

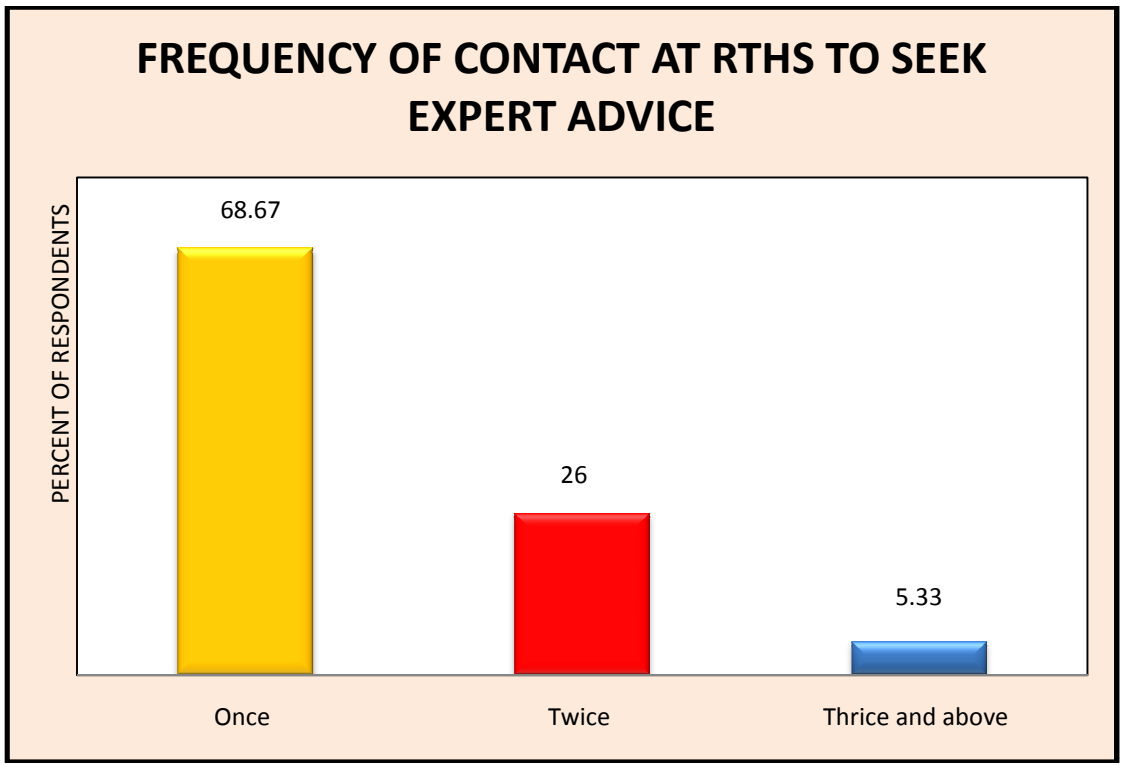

Fig.21: Diagrammatic representation of respondents according to their frequency of contact at RTHS to seek expert advice

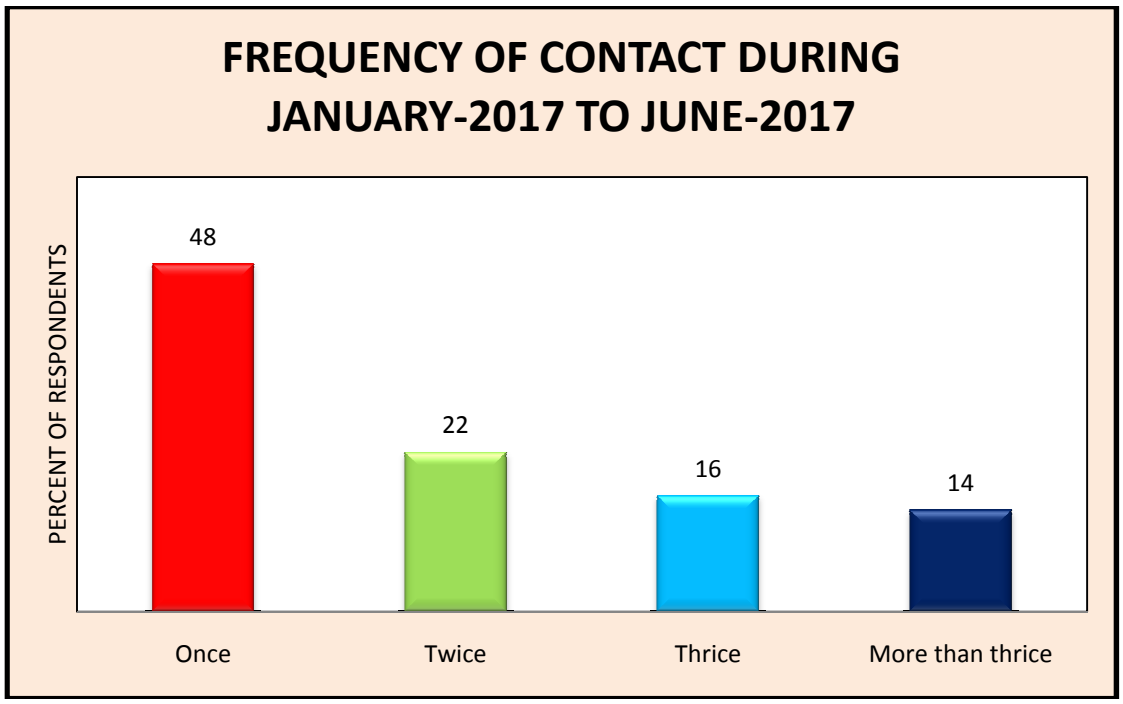

Fig.22: Diagrammatic representation of respondents according to their frequency of contact at RTHS during last six months

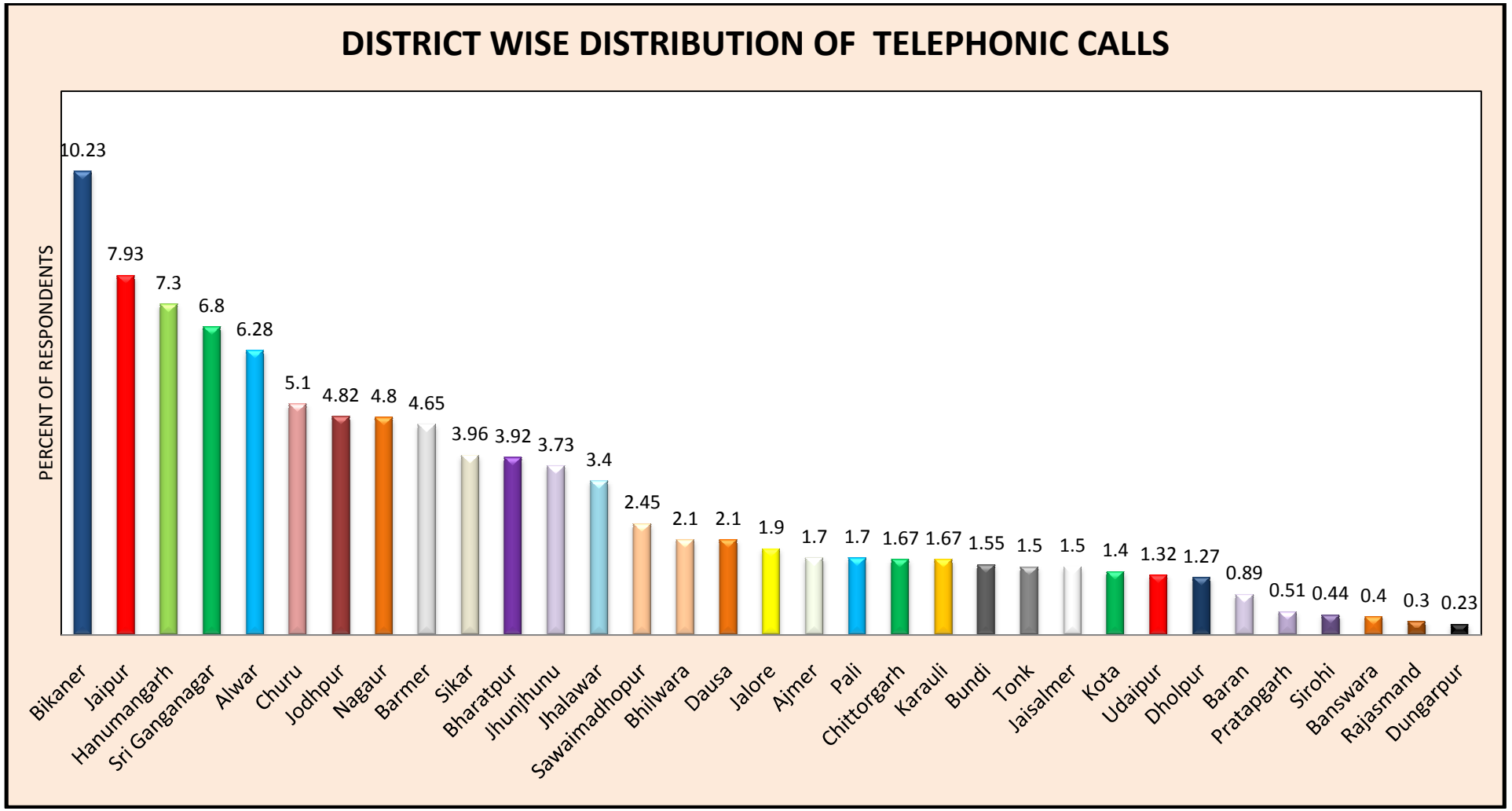

Fig.23: Diagrammatic representation of telephonic calls according to district wise

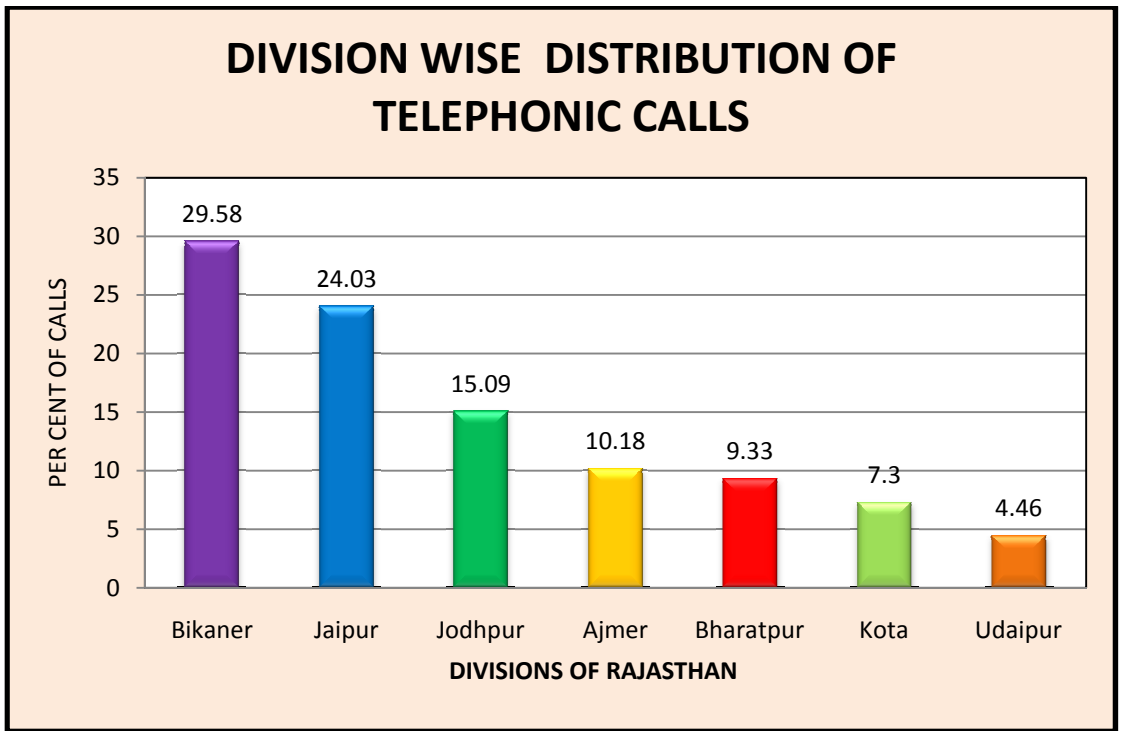

Fig.24: Diagrammatic representation of telephonic calls according to division wise

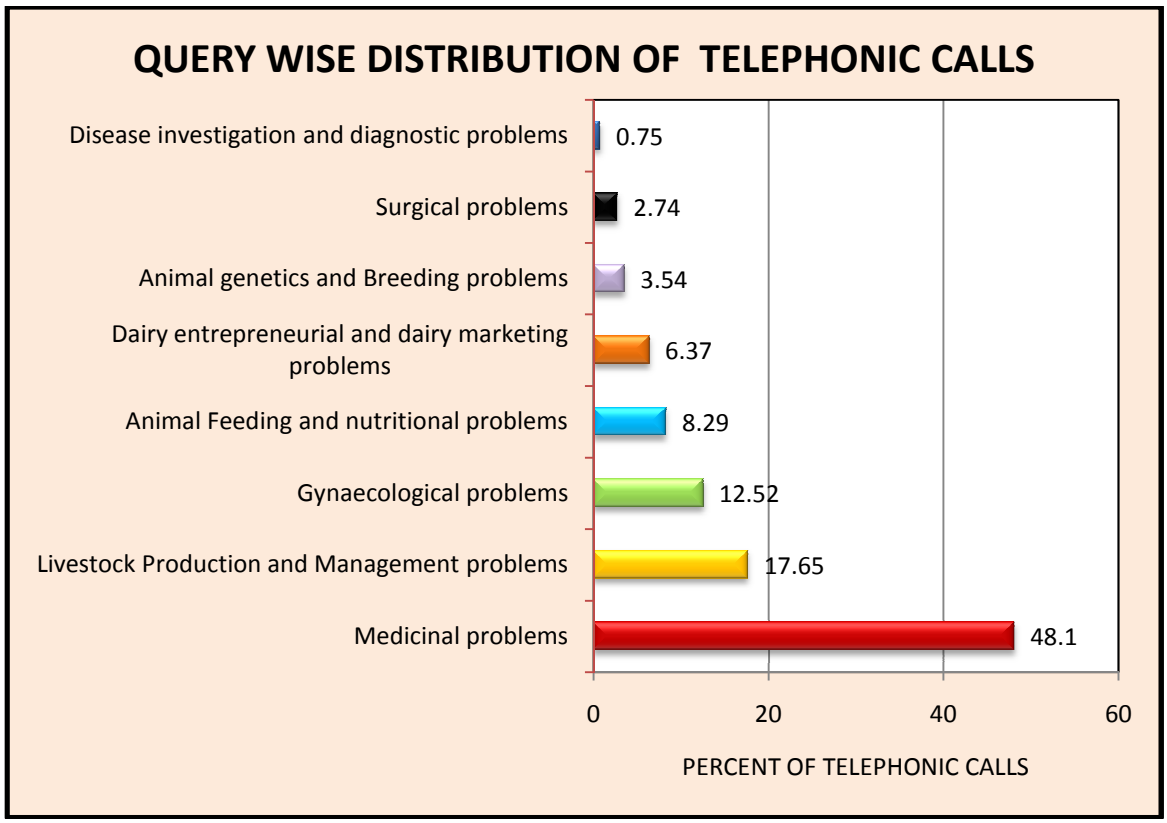

Fig.25: Diagrammatic representation of telephonic calls according to nature of query

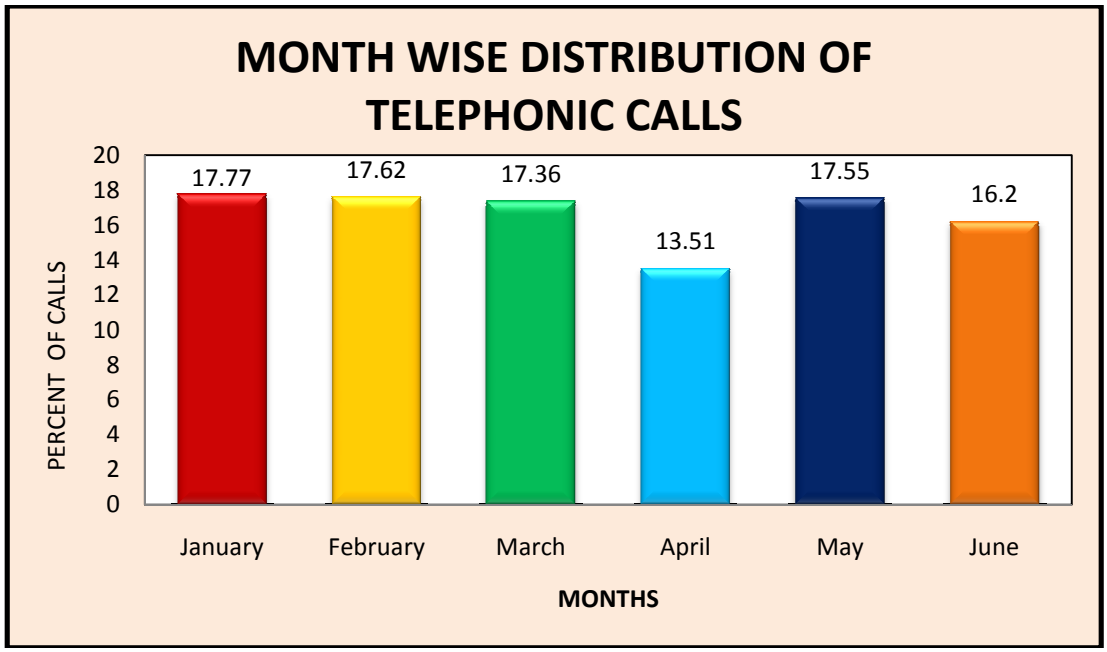

Fig.26: Diagrammatic representation of telephonic calls according to months wise

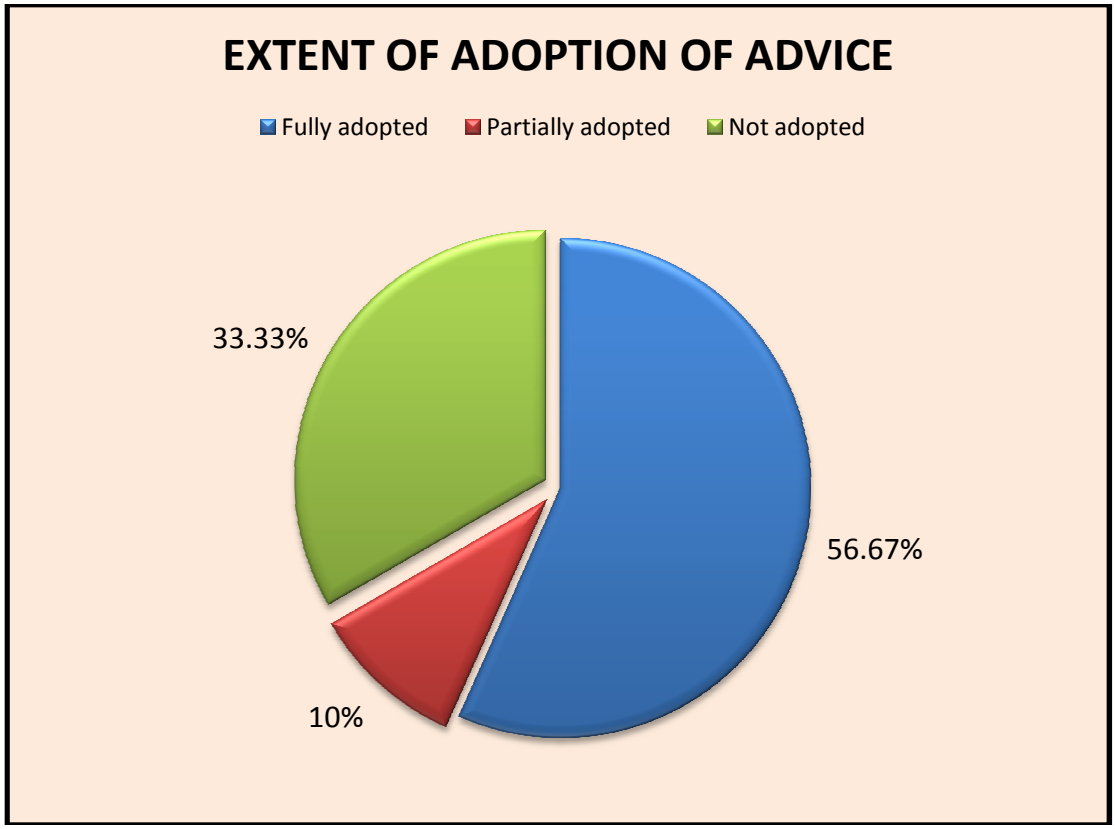

Fig.27: Diagrammatic representation of respondents according to extent of adoption of advice

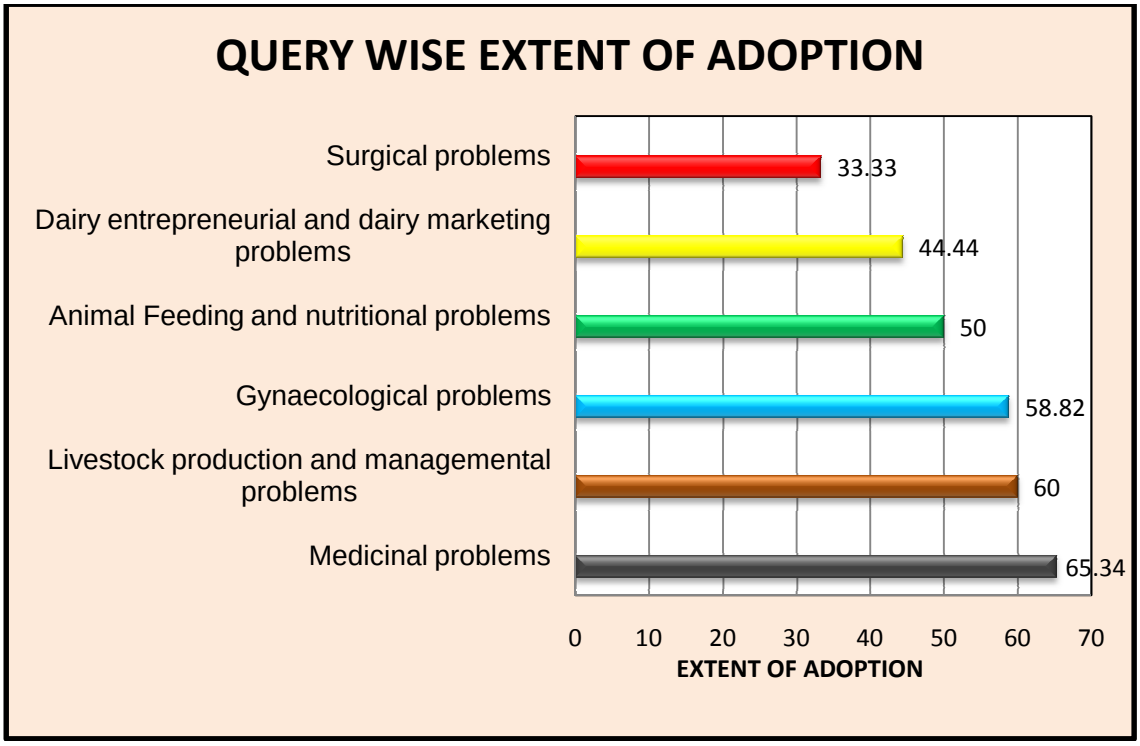

Fig.28: Diagrammatic representation of respondents according to query wise adoption

Fig.29: Diagrammatic representation of respondents according to their extent of satisfaction towards expert advice

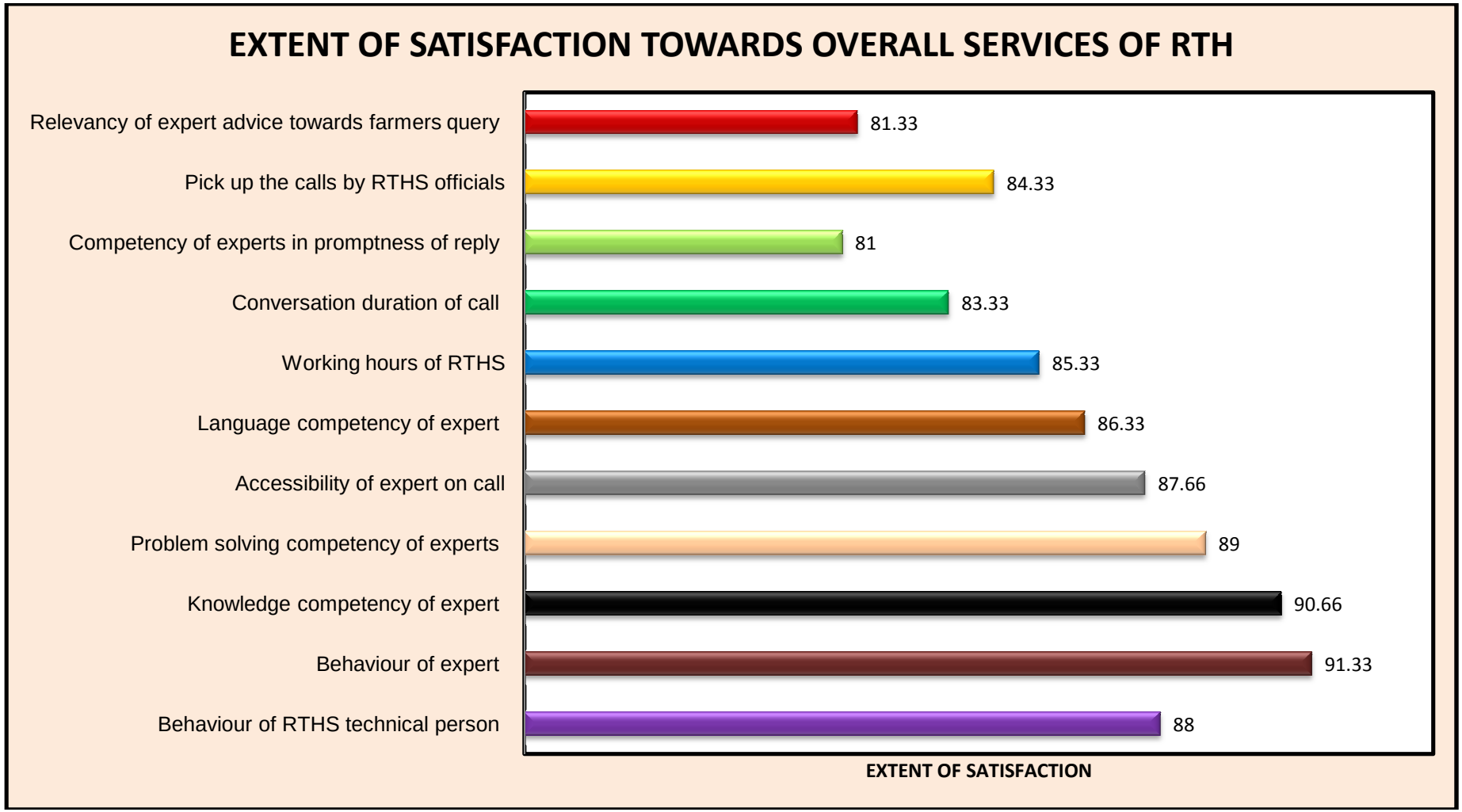

Fig.30: Diagrammatic representation of respondents according to their extent of satisfaction towards overall services of RTH

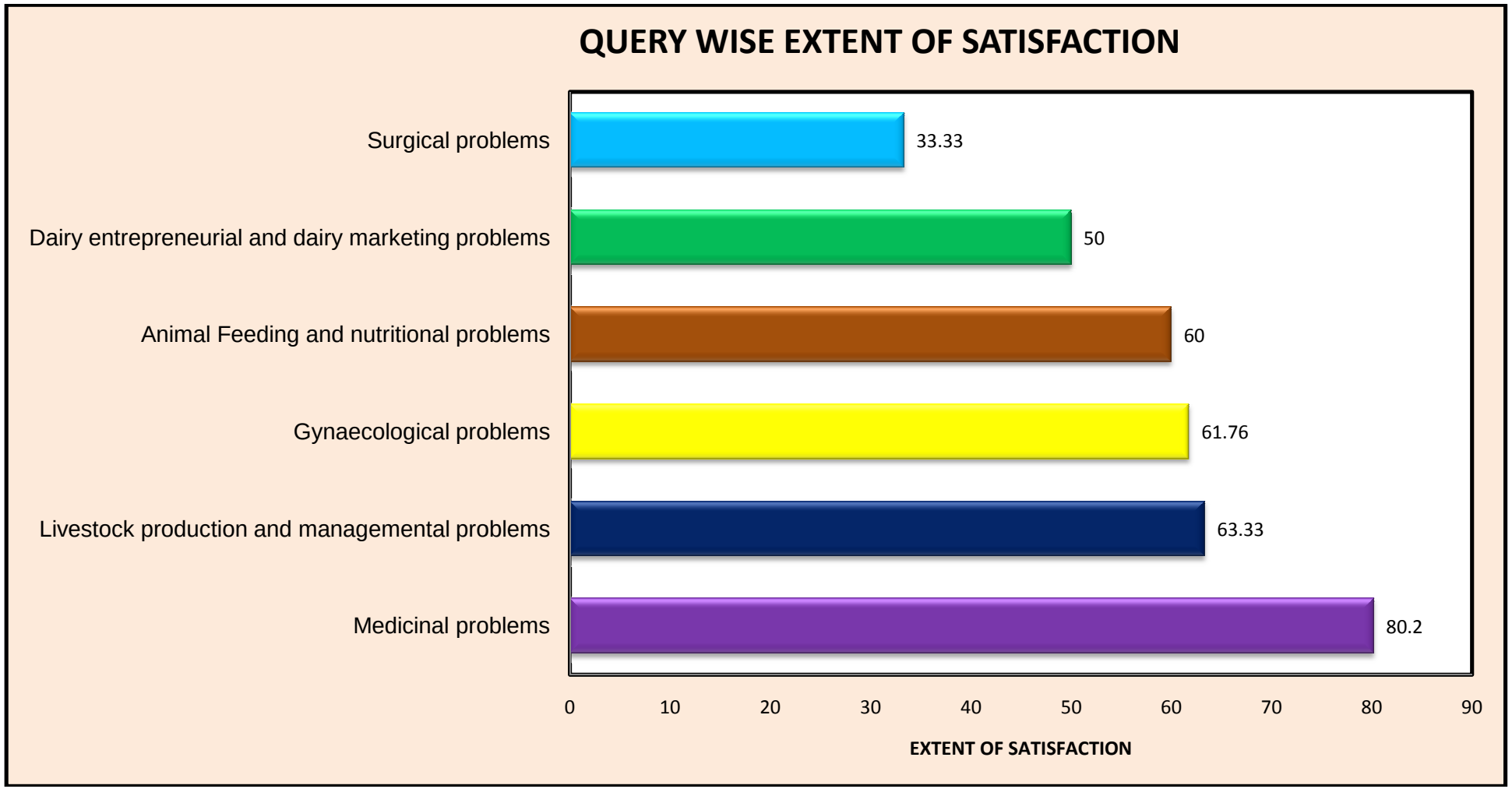

Fig.31: Diagrammatic representation of respondents according to query wise satisfaction

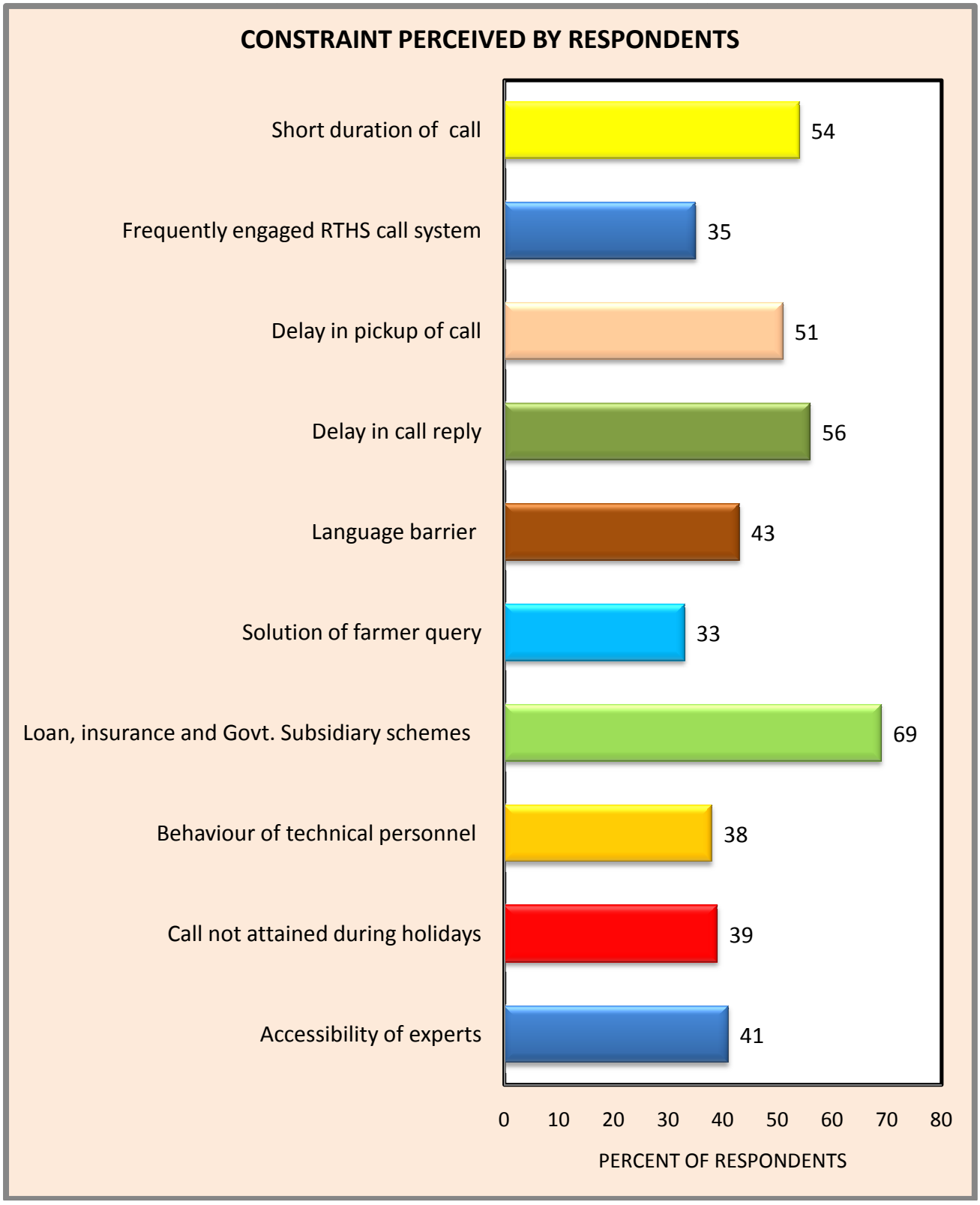

Fig.32: Diagrammatic representation of respondents according to the constraints perceived by them

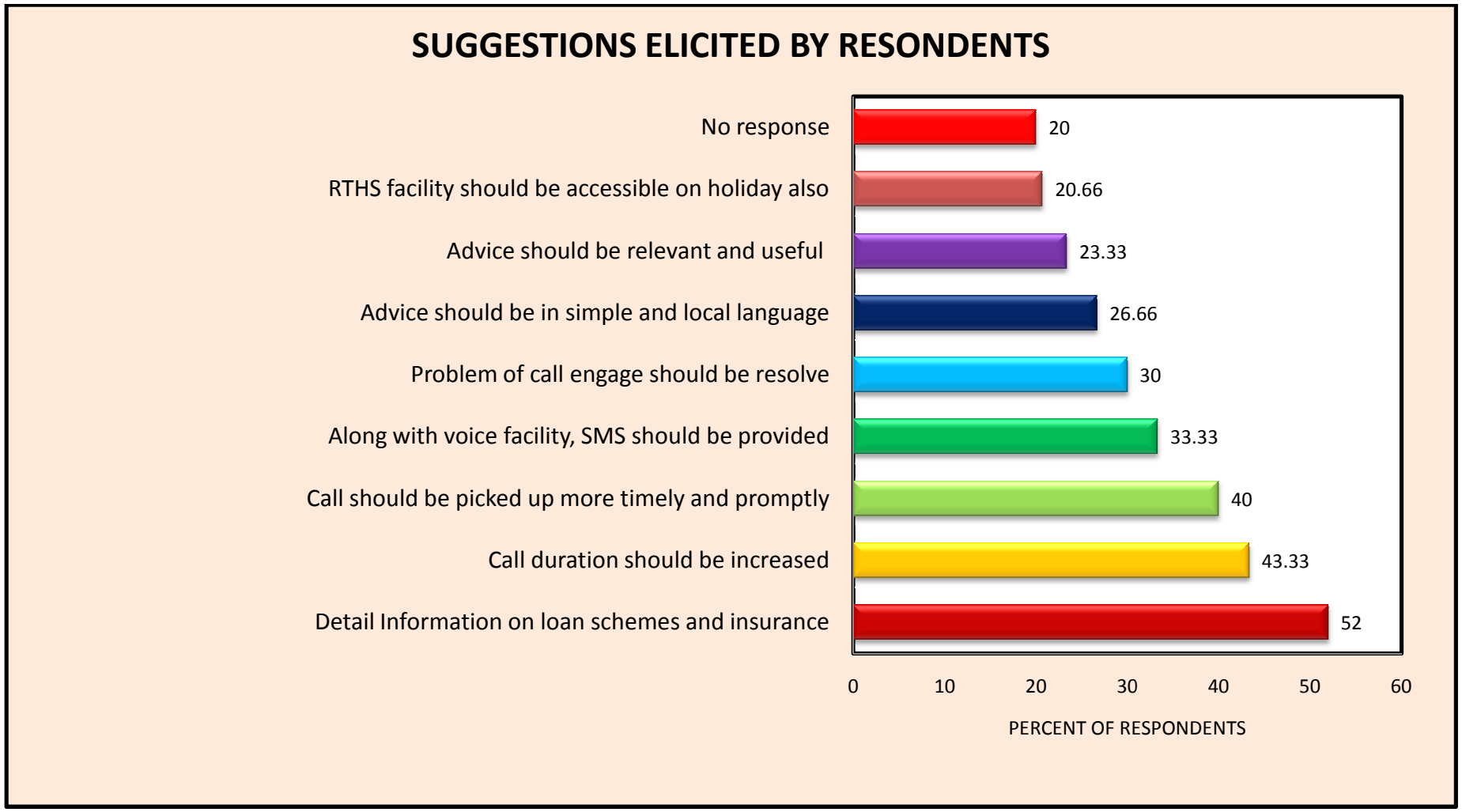

Fig.33: Diagrammatic representation of respondents according to suggestions elicited by them

Fig.1: Location of Rajasthan state in India

Fig.2: Location of research area in Rajasthan

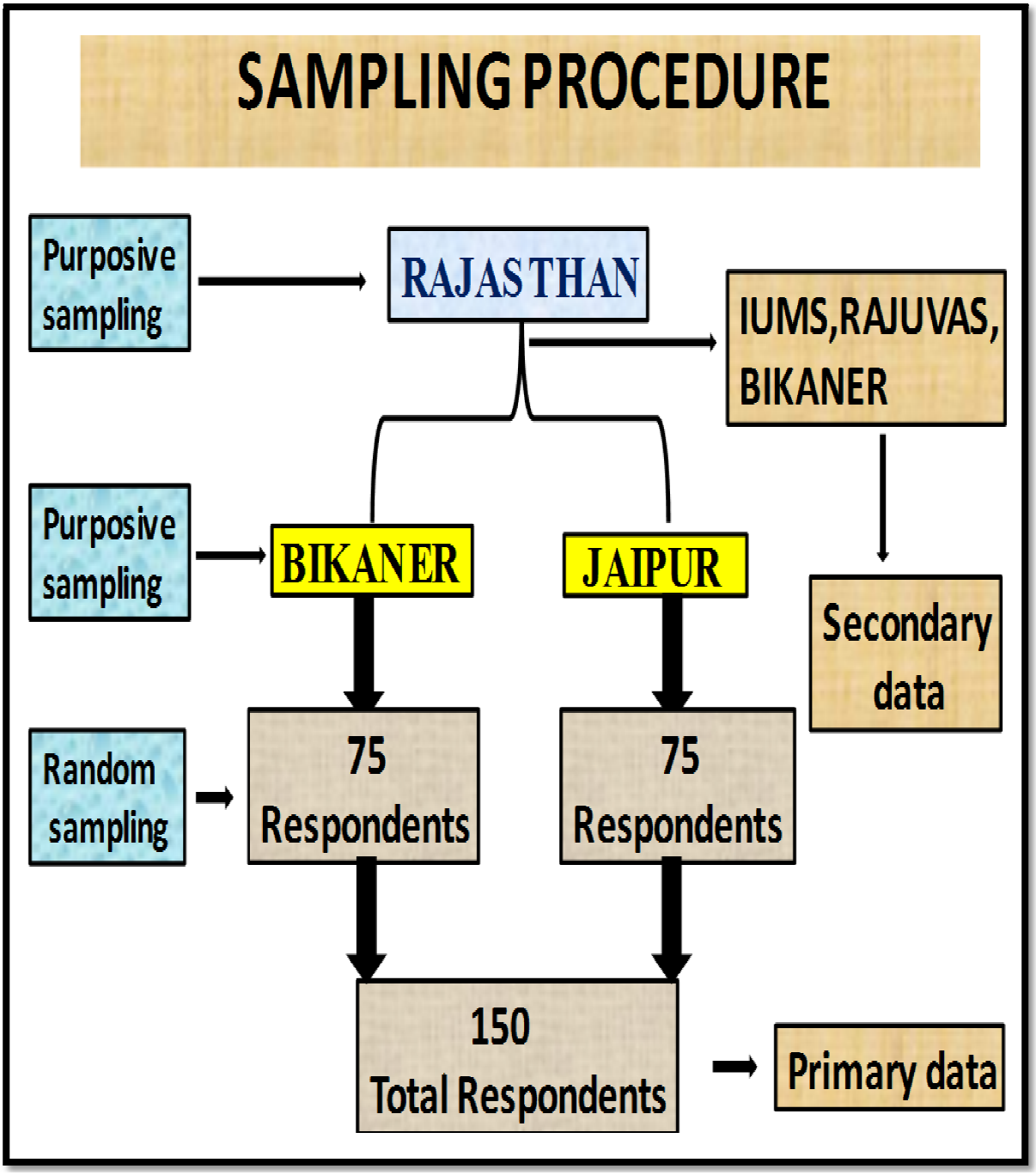

Fig.3: Samples and sampling procedure adopted for the study

Fig.4: Pictures showing RAJUVAS Tollfree Helpline Service Telephonic Call system with working staff

Fig.5: Conceptual model of study

Livestock owner calling at RTHS

Technical staff receiving telephonic call of livestock owner

Veterinary experts of RAJUVAS talking with livestock owner

Fig.6: Schematic representation of RTHS Operational Mechanism

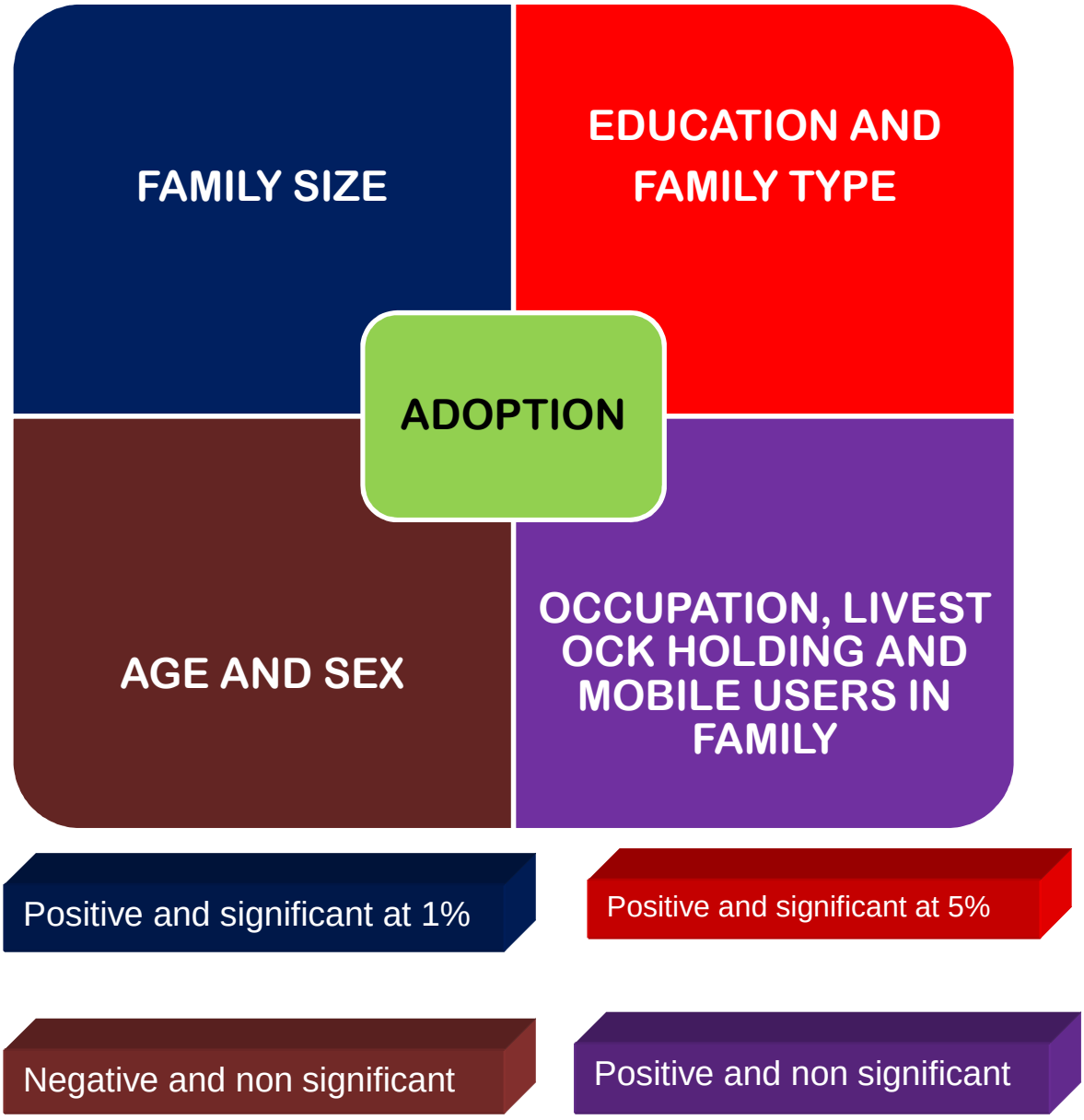

Fig.33: Empirical relationship of adoption with selected independent variables

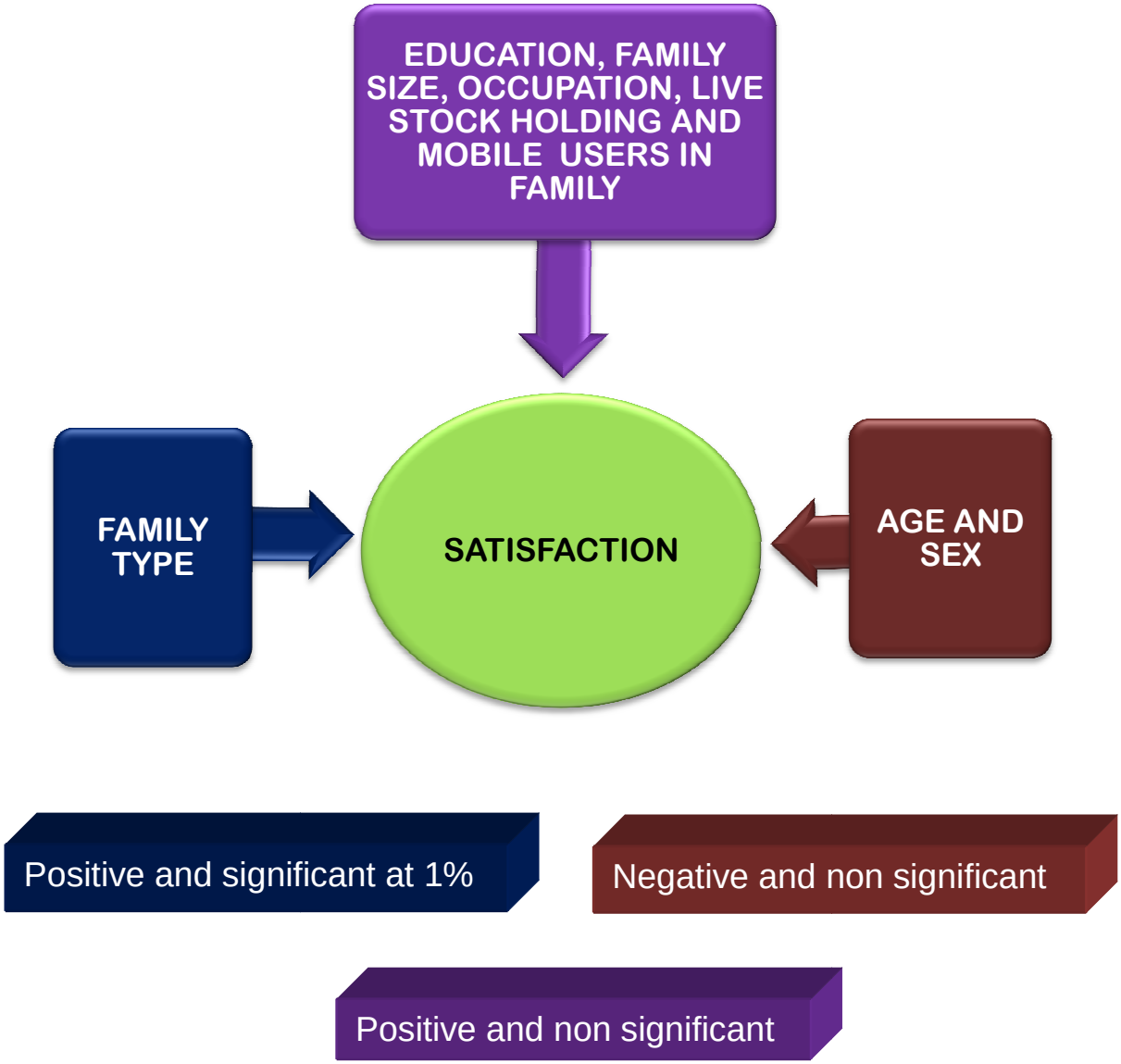

Fig.34: Empirical relationship of satisfaction with selected independent variables