

**Access and Utilization Pattern of ICT Tools by  
Extension Personnel for Transfer of  
Technology in Rajnandgaon District of  
Chhattisgarh Plain**

**THESIS**

*Submitted to*

**Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur**

**In partial fulfilment of the requirements for the**

**Degree of**

**MASTER OF SCIENCE**

*In*

**AGRICULTURE**

**(AGRICULTURAL EXTENSION AND COMMUNICATION)**

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**2019**

## CERTIFICATE – I

This is to certify that the thesis entitled “**Access and Utilization Pattern of ICT Tools by Extension Personnel for Transfer of Technology in Rajnandgaon District of Chhattisgarh Plain**” submitted in partial fulfilment of the requirement for the degree of **MASTER OF SCIENCE in AGRICULTURE (Agricultural Extension and Communication)** of Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur (M.P.) is a record of the bonafide research work carried out by **Ms. SWATI DEWANGAN**, Enroll. No. **170110026** under my guidance and supervision. The subject of the thesis has been approved by the Student’s Advisory Committee and the Director of Instruction.

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

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This is to certify that the thesis entitled “**Access and Utilization Pattern of ICT Tools by Extension Personnel for Transfer of Technology in Rajnandgaon District of Chhattisgarh Plain**” submitted by **Ms. SWATI DEWANGAN** to Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur in partial fulfilment of the requirements for the degree of **Master of Science in Agriculture** in the Department of **Extension Education** has been, after evaluation, approved by the External Examiner and by the Student’s Advisory Committee after an oral examination on the same.

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I, **Swati Dewangan** D/o Shri **Ramkumar Dewangan**, certify that the work embodied in the thesis entitled “**Access and Utilization Pattern of ICT Tools by Extension Personnel for Transfer of Technology in Rajnandgaon District of Chhattisgarh Plain**” is my own first hand bonafide work carried out by me under the guidance of **Dr. M.K. Dubey** at Department of Extension Education, College of Agriculture, JNKVV, Jabalpur during 2018-2019.

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

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Subject : Agricultural Extension and Communication

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## ACKNOWLEDGEMENT

First of all I thank the 'Almighty God' who has blessed me with the opportunity and strength to successfully complete this work.

I am privileged to express my deep and heartfelt gratitude towards the Chairman of thesis Advisory Committee **Dr. M.K. Dubey**, Professor, Department of Extension Education, JNKVV, Jabalpur for his illuminating guidance, intellectual and highly informative advice, incessant encouragement throughout the M.Sc. (Ag.) programme.

I sincerely extend my profound gratitude to members of my advisory committee **Dr. A.K. Pande**, Professor, Department of Extension Education and **Dr. A. Shrivastava**, Department of Agricultural Economics and Farm Management, JNKVV, Jabalpur for their scholarly guidance, timely help and suggestions during the course of research.

I owe my heartfelt thanks to faculty staff **Dr. N.K. Khare**, Professor and Head of the Department, **Dr. V.K. Pyasi**, **Dr. S.K. Agrawal**, **Dr.(Smt.) Seema Naberia**, **Dr. Kamini Bisht**, **Dr. D.K. Jaiswal** and **Dr. Parvez Rajan** for their co-operation and encouragement extended to me during my research work and other non-staff members.

I am extremely thankful to **Dr. P.K. Bisen**, Hon'ble Vice-Chancellor, JNKVV, **Dr. S.D. Upadhyay**, Directorate of Instruction, JNKVV, Jabalpur, **Dr. D. Khare**, Dean Faculty of Agriculture, JNKVV, Jabalpur, **Dr. P.K. Mishra**, Director Research Services, JNKVV, Jabalpur, **Dr.(Smt.) Om Gupta**, DES, JNKVV, Jabalpur and **Dr. R.M. Sahu**, Dean, College of Agriculture, Jabalpur for providing necessary facilities according to my research.

Diction is not at all enough to express feelings towards my admirable parents **Mr. Ramkumar Dewangan** and **Mrs. Rukhmani Dewangan** and my aunt **Mrs. Deveshwari Dewangan** and **Mrs. Rohini Dewangan**, my lovely brother **Manish Dewangan** and my uncle **Mr. Shailendra Dewangan**, who constantly inspired, educated, guided and moulded me into the present position, without whom, I may not have grown to this position.

Words fail in expressing my affection and sincere thanks to my beloved friends Suman, Akansha, Nidhi, Sandhya, Nazneen, Radha, Karishma and Arvind for their appreciation and moral support. Thanks are very few words for my UG Professor Mr. Uttam Deshmukh and my seniors Anjum Khan, Dhaneshwari, Tarani, Garima, Kumudani, Venkateshwar and Minakshi Meshram.

Place: Jabalpur

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(Swati Dewangan)

## LIST OF CONTENTS

| <b>Chapter No.</b> | <b>Title</b>                                          | <b>Page No.</b> |
|--------------------|-------------------------------------------------------|-----------------|
| 1.                 | Introduction                                          | 1 – 4           |
| 2.                 | Review of literature                                  | 5 – 15          |
| 3.                 | Material and methods                                  | 16 – 29         |
| 4.                 | Results                                               | 30 – 46         |
| 5.                 | Discussion                                            | 47 – 53         |
| 6.                 | Summary, conclusions and suggestions for further work | 54 – 60         |
|                    | 6.1 Summary                                           |                 |
|                    | 6.2 Conclusions                                       |                 |
|                    | 6.3 Suggestions for further work                      |                 |
|                    | BIBLIOGRAPHY                                          | 61 - 66         |
|                    | APPENDICES                                            |                 |
|                    | CURRICULLUM VITAE                                     |                 |

## LIST OF TABLES

| <b>Table Number</b> | <b>Title</b>                                                                           | <b>Page Number</b> |
|---------------------|----------------------------------------------------------------------------------------|--------------------|
| 3.1                 | List of district wise number of extension personnel                                    | 18                 |
| 3.2                 | List of extension personnel of selected blocks                                         | 19                 |
| 4.1                 | Distribution of extension personnel according to their age                             | 30                 |
| 4.2                 | Distribution of extension personnel according to their education                       | 31                 |
| 4.3                 | Distribution of extension personnel according to their knowledge level about ICT tools | 31                 |
| 4.4                 | Distribution of extension personnel according to their experience                      | 32                 |
| 4.5                 | Distribution of extension personnel according to their training received on ICT tools  | 32                 |
| 4.6                 | Distribution of extension personnel according to their duration of training            | 33                 |
| 4.7                 | Distribution of extension personnel according to their job commitment                  | 33                 |
| 4.8                 | Distribution of extension personnel according to their achievement motivation          | 34                 |
| 4.9                 | Distribution of extension personnel according to their innovativeness                  | 34                 |

| <b>Table Number</b> | <b>Title</b>                                                                                                  | <b>Page Number</b> |
|---------------------|---------------------------------------------------------------------------------------------------------------|--------------------|
| 4.10                | Overall distribution of extension personnel according to their accessibility to ICT tools                     | 35                 |
| 4.11                | Distribution of extension personnel according to their accessibility to individual ICT tools                  | 36                 |
| 4.12                | Overall distribution of extension personnel according to their extent of utilization of ICT tools             | 37                 |
| 4.13                | Distribution of extension personnel according to their extent of utilization of individual ICT tools          | 38                 |
| 4.14                | Distribution of extension personnel according to their purpose of utilization of ICT tools                    | 40                 |
| 4.15                | Association between profile of extension personnel and their extent of utilization of ICT tools               | 42                 |
| 4.16                | Association between profile of extension personnel and their purpose of utilization of ICT tools              | 43                 |
| 4.17                | Distribution of extension personnel according to their constraints faced in utilization of ICT tools          | 44                 |
| 4.18                | Distribution of extension personnel according to their suggestions for enhancing the utilization of ICT tools | 46                 |

## LIST OF FIGURES

| <b>Fig.<br/>Number</b> | <b>Title</b>                                                                           | <b>Page No.<br/><br/>(In between)</b> |
|------------------------|----------------------------------------------------------------------------------------|---------------------------------------|
| 3.1                    | Map of Rajnandgaon District                                                            | 17 – 18                               |
| 4.1                    | Distribution of extension personnel according to their age                             | 30 – 31                               |
| 4.2                    | Distribution of extension personnel according to their education                       | 31 – 32                               |
| 4.3                    | Distribution of extension personnel according to their knowledge level about ICT tools | 31 – 32                               |
| 4.4                    | Distribution of extension personnel according to their experience                      | 32 – 33                               |
| 4.5                    | Distribution of extension personnel according to their training received on ICT tools  | 33 – 34                               |
| 4.6                    | Distribution of extension personnel according to their duration of training            | 33 – 34                               |
| 4.7                    | Distribution of extension personnel according to their job commitment                  | 34 – 35                               |
| 4.8                    | Distribution of extension personnel according to their achievement motivation          | 34 – 35                               |
| 4.9                    | Distribution of extension personnel according to their innovativeness                  | 34 – 35                               |

| <b>Fig.<br/>Number</b> | <b>Title</b>                                                                                         | <b>Page No.<br/><br/>(In between)</b> |
|------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------|
| 4.10                   | Overall distribution of extension personnel according to their accessibility to ICT tools            | 35 – 36                               |
| 4.11                   | Distribution of extension personnel according to their accessibility to individual ICT tools         | 35 – 36                               |
| 4.12                   | Overall distribution of extension personnel according to their extent of utilization of ICT tools    | 37 – 38                               |
| 4.13                   | Distribution of extension personnel according to their extent of utilization of individual ICT tools | 37 – 38                               |
| 4.14                   | Distribution of extension personnel according to their purpose of utilization of ICT tools           | 40 – 41                               |

## **INTRODUCTION**

Information and Communication Technology (ICT) in agriculture is emerging field focusing on the enhancement of agricultural and other development in India. At present, the Information and Communication Technology (ICT) revolution has made the extension function more efficient and effective and provide extension systems with opportunities to deliver timely new information services to the clients. Now-a-days, it also provides new options for accessing information by providing it directly to farmers and rural households by extension agents, agribusiness and other intermediaries (Ragul et al., 2016).

In India more than 70% of population resides in rural areas (Census, 2011) in which 56% of the workforce (Census, 2011) is engaged in agriculture and allied activities alone. The farmers living in the 6,36,000 villages are feeding the 1.21 billion population (Census, 2011) of the country. Most of our development programmes are concerned with the rural areas, still the villages are struggling with issues of poverty, illiteracy, poor sanitation and urban migration. The declining natural resources and distancing of technology gap also complicate the situation. Besides, the ever burgeoning population also demands best out of crop production. Hence, it is imperative to keep our farmers profitable and remunerative through latest communication gadgets. In this context, new advanced Information and Communication Technology (ICT) tools such as internet and mobile phones have tremendous potential to facilitate technology transfer to farming community. Through ICT tools people in rural areas can connect with the local, regional and national economy and access markets, banking/ financial services and employment opportunities (Sivabalan et al., 2013).

Agricultural extension has a wider connotation, from providing non-formal agriculturally related continuing adult education for multiple audiences viz., farmers, youth and community. Today, educational programmes delivered by extension agents are more varied than ever and will continue to change to meet the needs of the clientele they serve. Given the need for sustainability in today's world, Agricultural Extension Agents (AEAs) are expected to know more, and meet the increasing demands of a diverse farmer population (Surudhi et al., 2017).

The role of Agricultural Officers in the agricultural extension system is very important because, they are the personnel whose technical contribution is directly influencing the farm productivity. Agricultural Officer is the grassroot level technical officer who is supposed to possess technical, communication cum management skill to deliver the agricultural inputs to the farming community more effectively.

Extension workers at the grassroot level, who have direct links with farmers are well positioned to make use of ICTs to access modern knowledge or other types of information that could facilitate the accomplishment of their activities. In a modern agricultural extension system, they need to know how to use ICTs for facilitating innovations (Martin et al., 2001).

For keeping these in view the present study was undertaken with the following specific objectives:

**Objectives of the study:**

1. To know the socio-economic profile of extension personnel using ICT tools.
2. To study the accessibility to ICT tools by the extension personnel.
3. To ascertain the utility pattern of ICT tools for transfer of technology (TOT) by the extension personnel.

4. To find out the association between independent and dependent variables.
5. To enumerate the constraints faced by the extension personnel and their suggestions in utilization of ICT tools.

**Role of ICTs:**

1. ICTs can be helpful in providing the interaction among the researchers, extension workers and farmers.
2. ICTs help in providing up to date information services to the farmers such as on package of practices, market information, weather forecasting, the input supply, credit availability etc; can be provided at the earliest possible time.
3. ICT provide information on insect- pest & diseases and their control measures, early warning systems, information regarding research development programmes, crop insurance and post harvest technology.
4. ICT can extend services regarding farm business and management information to the farmers.

**Scope and importance of the study:**

Agriculture is an educational service which brings information and communication technologies to farming communities to enable them to improve their production, income and standard of living. At present the extension personnel who are in the Department of Agriculture performing their role in transferring agriculture & allied technologies to the farming community from time to time. But at this juncture the extension agents face number of problems in contacting farmers and the researchers due to physical distances and lack of transportation in remote areas etc. Hence, the application of ICT offers excellent possibilities, for strengthening TOT between research and extension system and further onward transmission to the end- users. Thus, for effective and efficient service delivery, the extension service and research organization need to be appropriately supported with the use of ICT tools. Hence, the findings of the proposed research study

was immense utility to the extension personnel to formulate and execute suitable strategies enhancing the use of ICT tools for transfer of technology.

**Limitations of the study:**

1. The study was carried on limited number of extension personnel due to limitation of time and resources.
2. The study was restricted to few numbers of variables due to limited time and resources.
3. The conclusions were based on the data provided by the extension personnel, therefore, the validity and reliability on how honestly they provided the information.

**Presentation of the study:**

The thesis is presented under six chapters. The first chapter deals with the introduction, objectives, roles, scope and limitations of the study. The second chapter is review of literature, deals with the review of important studies related to the field of present study. In the third chapter, the materials and methods used in the research work including operationalization of the concepts, measurement procedure of the variables and the statistical tools used are presented. The fourth chapter deals with result. The fifth chapter deals with discussions and the sixth chapter deals with summary, conclusions and suggestions for further work. The bibliography, appendices and vita are furnished at the end.

## **REVIEW OF LITERATURE**

This chapter present the findings of past research work related to the present problem appeared in the research journals, articles, documents, approved thesis, books and magazines in order to keep up to date information on :-

1. To know the socio – economic profile of extension personnel using ICT tools.
2. To study the accessibility to ICT tools by the extension personnel.
3. To ascertain the utility pattern of ICT tools for transfer of technology (TOT) by the extension personnel.
4. To find out the association between independent and dependent variables.
5. To enumerate the constraints faced by the extension personnel and their suggestions in utilization of ICT tools.

### **2.1 Profile of the extension personnel**

#### **1. Age**

Vidyasagar (1998) reported that higher percentage of the respondents (52.85%) fell in young age group (20 to 35 years) followed by (47.15%) in older age group (above 35 years).

Adesope *et al.* (2007) in their study on extension and research proficiency requirement in information and communication technologies in Southeastern Nigeria concluded that 58.5 per cent of the researchers are between the 35-40 years old, while 100 per cent of the extensionists are between 29-34 years.

Nagalaksmi (2008) in her study on integrating ICT with multiple functions for Agriculture Development concluded that

majority of extension personnel (52.94%) were under old age category, 26.47 per cent of extension personnel were under middle age and 20.59 per cent of extension personnel were under young age category.

Sarada *et al.* (2009) revealed that more than half (56%) of the extensionists were middle aged followed by above middle aged and young extensionists with 28 per cent and 16 per cent respectively.

Halasangi and Swamy (2012) reported that 100 per cent of the respondents were young (< 35 years) in age.

Raksha *et al.* (2014) revealed that more than half (51.67%) of the total extension personnel were young followed by middle (28.33%) and old age (20.00%).

Baig (2015) revealed that higher percentage (60.83%) of the respondents were young age group (< 35 years) followed by middle (39.17%) and old age (0.00%).

Gangadharan (2015) revealed that higher percentage (48.66%) of the extension personnel were middle age group followed by old (34.66%) and young (16.66%).

## **2. Education**

Ingale (1987) revealed that majority of the respondents (AOs) (84.00%) of them were B.Sc. (Ag.) and 16.00 per cent were M.Sc.(Ag.) and including Ph.D.

Sambireddy (1997) found that majority (86.60%) of respondents were graduates in agriculture, while (10.00%) and (3.40%) were having post graduate and doctorate qualifications respectively.

Ramprasad (2004) indicated that majority (72.20%) of the respondents were graduates while (26.70%) were post graduates and only (1.10%) had doctorate degree.

Sarada (2004) reveals that higher percentage (56.00%) of the respondents had bachelor degree followed by (44.00%) with post graduate degree, but none of them had doctorate degree.

Hedjazi *et al.* (2006) inferred that higher percentage of the respondents (61.50%) had Bachelor degree followed by Master's degree (34.60%) and only 3.80 per cent of the specialists had Ph.D. degree.

Tilwani and Agrawal (2010) revealed that higher percentage of the respondents (52.89%) had Bachelor degree, 36.55 per cent of them had Master degree of education and only 10.56 per cent of them had Ph.D. degree.

Gangadharan (2015) inferred that higher percentage (46.66%) of the extension personnel were B.Sc. (Ag.) followed by (41.33%) were M.Sc. (Ag.), 4.00 per cent were degree and 2.00 per cent respondents were Ph.D.

### **3. Knowledge level**

Bahgat and Antar (2007) in their study on Evaluations of extension personnel in Assiut governorate of their levels of knowledge and use and the degree of importance of information communication technology revealed that 49% of them had low or very low levels of knowledge on ICT, only 18.2% of them had high or very high levels of knowledge.

Agwu *et al.* (2008) in their study on Use of Information Communication Technologies (ICTs) among Reasearchers, Extension Workers and Farmers in Abia and Enugu States: Implications for a national Agricultural Extension Policy on ICTs reported that majority (52.5%) of the researchers had high knowledge level while only 7.5% had low knowledge level of ICTs. In the case of the extension workers, majority 57.5% had moderate knowledge level while only 10. 0% had low knowledge level. On the part of farmers, majority (56.7%) had low knowledge level of ICTs.

This shows that apart from the researchers, the extension workers and farmers need to be trained on the use of ICTs.

James and Lakshminarayan (2018) reported the higher percentage of the agriculture functionaries (42.50%) had overall high level of knowledge regarding ICT tools whereas 32.50 per cent were having medium and 25.00 per cent respondents were having low level of knowledge.

#### **4. Experience**

Helen (2008) reported that higher percentage of extension personnel (40.56%) had low experience up to 10 years, 40 per cent of the extension personnel possessed the experience from 11-20 years and only 14.44% of the extension personnel gained above 21 years of experience.

Raksha *et al.* (2014) revealed that higher percentage (59.44%) of the extension personnel fall into low category of years of service followed by medium (22.22%) and high (18.33%).

Raksha and Meera (2015) conducted a study on e-Readiness in Agricultural Extension System and concluded that higher percentage of the respondents (51.56%) belonged to less year of service.

Noor Agha *et al.* (2018) revealed that higher percentage of the extension personnel (60.00%) had up to 10 years job experience.

#### **5. Training received on ICT tools**

Reddy (1983) revealed that majority (91.88%) of the village extension officers were trained for shorter duration and only few (8.22%) were trained for longer period.

Rao (1988) revealed that majority (68.75%) of the village extension officers had received average training.

Lakshminarayan (1992) in his study on extension teaching methods used by Agricultural Assistants found that 80.00 per cent of

the Agricultural Assistants undergone refresher training and 20.00 per cent of them did not undergo any refresher training.

Prakash *et al.* (1998) found that more than half (55.76%) of the respondents were with medium level of training undergone.

## **6. Job commitment**

Prasannakumar (1985) found that 44 per cent of Assistant Agricultural Officers under Training and Visit system in Karnataka had medium level of commitment.

Mohan (2000) reported that 73.17 per cent of AAOs had medium level of organizational commitment.

Rao (2000) in his study on the communication techniques used by the agricultural assistants of KSDA in Dharwad district reported that higher percentage (40%) of the respondents had medium level of job commitment followed by 31.66 per cent of AAs in low category and 28.33 per cent of the AAs were in the category of high level of job commitment.

Manjunath (2004) revealed that majority (80.96%) of extension workers belonged to medium level of organizational commitment.

Sarada (2004) revealed that equal per cent (36.00% each) of respondents had medium and high job commitment whereas (28.00%) were with low job commitment.

## **7. Achievement motivation**

Mohan (2000) reported that higher percentage (69.51%) of AAOs were having medium achievement motivation followed by high level (19.21%) and 12.19 per cent of the respondents were low achievement motivation.

Manjunath (2004) reported that majority (66.67%) of extension workers belonged to medium achievement motivation category.

Ramprasad (2004) revealed that majority of the respondents (72.2%) had medium achievement motivation followed by low 14.4 per cent and high 13.4 per cent achievement motivation.

Venkatarao (2004) depicted that majority (75.27%) of AOs had medium achievement motivation followed by low (12.90%) and high (11.83%).

Kiran (2007) opined that majority of scientists (80.63%) had medium level of achievement motivation whereas 11.87 per cent of them were in high level and the 7.50 per cent of them were in low level of achievement motivation category.

## **8. Innovativeness**

Senthilkumar (2000) found that higher percentage (67.74%) of the extension professionals were having medium level of innovativeness followed by high level (31.66%) of innovativeness and only 5 per cent having low level of innovativeness.

Sarala (2008) reported that agricultural officers who were innovative constituted higher percentage (80%) belonged to medium category of innovativeness followed by less innovative (12.63%) and highly innovative (7.37%).

Baig (2015) indicated that higher percentage (54.17%) of the respondents possessed medium level of innovativeness followed by high level (29.17%) and low level (16.67%) of innovativeness.

Gangadharan (2015) indicated that majority of the extension personnel (71.33%) belonged to medium level of innovativeness followed by high level (14.66%) and low level (14.00%).

### **2.2 Accessibility to ICT tools by the extension personnel**

Agwu et al. (2008) reported that 65% of the researchers, 56% of the extension workers and 33% of the farmers asserted that they had access to ICT facilities. The fact that majority (67%) of the farmers do not have access shows that most rural areas in Enugu

and Abia states don't have access to major ICT facilities and so are not likely to be aware of major agricultural findings.

Oladosu (2008) in his study on extension workers' information technology use characteristic and training needs of Nigeria revealed that majority (80%) of the extension agents had access to the internet. Only a significant proportion (7%) uses it regularly.

Salau and Saingbe (2008) in their study on access and utilization of information and communication technologies (ICT) among agricultural researchers and extension workers revealed that researchers had 87.00 per cent access to ICT facilities while the extension worker had (66.00%) access.

Cynthia and Nwabugwu (2016) ) in their study on challenges to adoption of ICT tools by agricultural extension workers revealed that majority (92.8%) of the respondents had access to mobile phone, while 52.2% had access to computer. In this study found that majority of extension agents in south east Nigeria had access to mobile phone.

## **2.3 Utility pattern of ICT tools for transfer of technology by the extension personnel**

### **1. Extent of utilization of ICT tools by extension personnel**

Bahgat and Antar (2007) revealed that levels of use of ICT were evaluated as low or very low by over 60% of them and as high or very high by only 12.6% of them.

Singh *et al.* (2009) elucidated the use of Internet based e-resources at Manipur University. It was noticed that 30.7% of respondents use Internet to little extent, 28.8% to some extents and 13.1% of respondents use Internet to full extent. However 27.4% of respondents are non- users of Internet.

Amar *et al.* (2011) concluded that, nearly half section (46.67%) of the respondents had medium extent of use of ICT followed by only (10.00%) had low level extent of use of ICT.

Samansiri and Wanigasundera (2014) revealed that majority (100%) of the respondents had availability of mobile phones and internet connectivity (36.60%) were most commonly used ICT tools by extension workers.

Ragul *et al.* (2016) in their study on utility pattern of ICT tools for transfer of technology revealed that radio was not used by cent percent of extension personnel whereas television was used frequently by the majority of them followed by telephone very frequently. In case of mobile, internet and computer used by almost all very frequently. Video- conferencing, e- newspaper were used by majority of them less frequently.

## **2. Purpose of utilization of ICT tools by extension personnel**

Bahgat and Antar (2007) revealed that highest propotion of respondent was in the case of searching the internet and the lowest was in the case of spread sheet. This may be due to that some of extension personnel are working for VERCON and may be using the internet in their work more than other skills.

Oladosu (2008) revealed that majority (53%) claimed that they rarely seek extension information, about one third (33%) sometimes seek extension information while a very small proportion do seek extension information regularly.

Salau and Saingbe (2008) revealed that majority of the sampled researchers used ICT items such as telephones, radio, television, video film / camera and power point for agricultural research and extension activities, while only 56.22% of the extension workers use these equipment.

Manty (2011) found that for getting the information, extension personnel in North Karnataka used internet (97.5%), web based agricultural information portals (95%), mobile (72.5%). For “transfer of technology” extension personnel used internet (90%), mobile (75%), video conferencing (67.5%), computer (57.5%) and telephone (52.5%).

Ragul *et al.* (2016) revealed that regarding purpose of utilization they used internet and agriculture portal for information purpose, whereas video conferencing and computer for training purpose, while telephone and mobile phone were used by majority of them sharing information with other organization.

## **2.4 Association between profile of extension personnel and utilization pattern of ICT tools**

Amar *et al.* (2011) concluded that, training received and extent of knowledge were positively correlated and significantly associated with use of ICT and experience was non significantly associated with extent of use about ICT.

Ometesho *et al.* (2012) proved that, education was positively correlated and significantly associated to ICT.

Rudroju (2013) revealed that education, innovative proneness and internet accessibility were positively correlated and significantly associated with utilization of ICTs.

Tanko *et al.* (2013) indicated that, age shown a positive correlation and significant association with utilization of ICT facilities.

Jha *et al.* (2014) inferred that innovativeness was positively and significantly associated with utilization of ICT.

Yakubu *et al.* (2014) revealed that, age and education shown a positive correlation and significant association with utilization of ICT.

Baig (2015) concluded that extent of knowledge and innovativeness were positively correlated and significantly associated with utilization of ICT.

Gupta (2015) indicated that education, achievement motivation and innovativeness had positively correlated and significantly associated with extent of utilization of ICTs.

Khondokar and Roy (2015) showed that, age and accessibility to ICT tools were positively correlated and significantly associated with the preferences of ICT tools.

## **2.5 Constraints faced by the extension personnel and their suggestions in utilization of ICT tools**

Salau and Saingbe (2008) in their study on access and utilization of information and communication technologies (ICT) among agricultural researchers and extension workers revealed that lack of electricity supply was rated highest (62.22%) and (82.21%) by researchers and extension workers respectively.

Singh et al. (2009) found the difficulties in browsing the internet based information resources. It was found that low speed internet access and erratic power supply are problems with regards to the use of internet based e-resource.

Manty (2011) reported that the problems faced by extension personnel in using ICT. The general problems faced by UASD extension personnel were 'insufficient power supply' (50%), 'internet connection is poor/slow' (37.5%), 'lack of proper training facility' (30%) and lack of knowledge (20%). While general problems faced by the KSDA extension personnel was 'insufficient power supply' (87.5%), 'lack of proper training facility' (75%), 'lack of knowledge' (62.5%) and 'internet connection is poor/slow' (55%). With respect to Physiological Problems UASD extension personnel faced the problems like 'head ache' (37.5%), 'back ache' (25%), 'eye fatigue' (15%), 'shoulder pain' (10%) and 'wrist pain' (5%). Whereas, KSDA extension personnel faced the problems like 'eye fatigue' (37.5%), 'back ache' and 'head ache' (30%), 'shoulder pain' (20%) and 'wrist pain' (12.5%). Whereas, in case of Social Problems UASD extension personnel expressed decreased in the frequency of 'time spent in social events or gathering outside home' and 'time spent with children's (37.5%) followed by 'conversation with parents' (32.5%), meeting with friends (30%) and visit to relative house (25%). While the social problems faced by the KSDA extension personnel were; conversation with parents (37.5%), time spent in social events or

gathering outside home (30%), time spent with children's (25%), 'meeting with friends' (12.5%), 'visit to relative house' (5%).

Kale *et al.* (2017) revealed that among the technical constraints, slow functioning of internet and computers (94.68%) was ranked first followed by frequent electricity failure. Among the operational constraints, lack of adequate knowledge about hardware, software and internet browser (82.98%) was ranked first, followed by lack of ICT – oriented education and training (78.72%), lack of expertise and skill in ICT use (75.53%). All these constraints can be overcome by implementing suggestions by respondents like provision of training in ICT use.

## **MATERIAL AND METHODS**

“Research methods are the tools and techniques for doing research”. According to Kothari (2004), research methodology is a method to analytically explain the research problem. It may be described as a science of analysis how research is done systematically. The chapter deals with the methods and procedures used for planning and conducting the research work. It consists of following subheads:

1. Locale of the study
2. Sampling technique used
3. Selection of ICT tools
4. Variables, their operationalization and measurement
5. Instrument and method of data collection
6. Statistical methods used and
7. Derivation of hypotheses.

### **3.1 Locale of the study**

#### **State profile:**

Chhattisgarh is one of the 29 states of India, located in the centre- east of the country. It is the ninth- largest state in India, with an area of 1,35,192 km<sup>2</sup> with a 2011 population of 25.5 million. Chhattisgarh is the 16<sup>th</sup> most populated state in the country. The state was formed on 1 November 2000 by partitioning ten Chhattisgarhi and six Gondi speaking southeastern districts of Madhya Pradesh. Chhattisgarh is a new state and having faster growth rate in agriculture as well as access to different ICT tools Computer with Internet. The study aims at delineating the utilization pattern of ICT tools among the extension functionaries of the digitally well-performing and responsive state. Since Chhattisgarh government has launched the SKY scheme for making sure the availability of internet connectivity to remote areas, so it was also necessary to study the utilization pattern of ICT tools for further improvement and strengthen

of the extension activities. To fulfil the objectives of this study we have purposively selected Chhattisgarh state.

### **District profile:**

The investigation was conducted in Rajnandgaon district of Chhattisgarh plain. The district covers an area of 8,070 km<sup>2</sup> (Anonymous, 2011a). The district is situated in the western part of newly created Chhattisgarh state, the district lies between 20°70'-22°29' N Latitude and 80°23'-81°29' E Longitude. It has an average elevation of 307m above sea level. Rajnandgaon district is surrounded by Kawardha district in north, Durg district in the east, Bastar district in the south and Garchiroli, Bhandara (M.H.) and Balaghat (M.P.) district in the west. The district headquarter Rajnandgaon is on the Mumbai – Howrah line of southeastern railways. The National Highway no. 6 (Great Eastern Road) also passes through the town of Rajnandgaon. The district has been divided into 5 Sub - divisions namely Khairagarh, Dongargarh, Rajnandgaon, Dongargaon and Mohla. The district comprises of 9 blocks namely Chhuikhadan, Khairagarh, Rajnandgaon, Dongargarh, Dongargaon, Chhuriya, Ambagarh Chowki, Mohla and Manpur. Rajnandgaon district comprises 3 sub – divisional agriculture office namely Rajnandgaon, Khairagarh and Ambagarh Chowki. The population of district is 15,37,133 out of which 7,62,855 are male and 7,74,278 are female (Anonymous, 2011b). The literacy level of the district is 75.96 per cent. The district has 1685 villages, 1 Nagar Palik Nigam, 2 Nagar Palika, 5 Nagar panchayat, 9 Janpad Panchayat, 692 Gram Panchayat.

## **3.2 Sampling technique used**

### **Selection of district**

Chhattisgarh plain comprises of 15 districts namely Balod, Rajnandgaon, Baloda bazaar, Bilaspur, Raipur, Bemetara, Mahasamund, Mungeli, Dhamtari, Durg, Kawardha, Janjgir-champa, Raigarh, Korba, and parts of Kanker. Out of which Rajnandgaon district was selected purposively because 2<sup>nd</sup> larger number of Extension Personnel working in this district.

**Table 3.1: List of district wise number of extension personnel**

| <b>S. No.</b> | <b>Name of District</b> | <b>No. of extension personnel</b> |
|---------------|-------------------------|-----------------------------------|
| 1.            | Balod                   | 350                               |
| 2.            | <b>Rajnandgaon</b>      | <b>343</b>                        |
| 3.            | Raipur                  | 200                               |
| 4.            | Bilaspur                | 150                               |
| 5.            | Baloda bazaar           | 148                               |
| 6.            | Kawardha                | 140                               |
| 7.            | Bemetara                | 135                               |
| 8.            | Mahasamund              | 130                               |
| 9.            | Mungeli                 | 126                               |
| 10.           | Dhamtari                | 121                               |
| 11.           | Durg                    | 100                               |
| 12.           | Raigarh                 | 100                               |
| 13.           | Parts of Kanker         | 90                                |
| 14.           | Korba                   | 85                                |
| 15.           | Janjgir-champa          | 80                                |

**Source – D.D.A. Office, C.G.**

#### **Selection of block**

The Rajnandgaon district comprises of 09 blocks namely – Rajnandgaon, Chhuhikhadan, Chhuriya, Chowki, Dongargaon, Dongargarh, Khairagarh, Manpur and Mohla. Out of which only 04 blocks namely – Rajnandgaon, Dongargaon, Khairagarh and Chowki were selected randomly for the study.

#### **Selection of the respondents**

After selection of blocks, a list of block wise respondents (Grassroot level workers - Rural Agriculture Extension Officers and Rural Horticulture Extension Officers, those who participated with farmers for working the extension activities) were prepared and 75% extension personnel were selected from each block through random sampling method to make the total sample size of 99 for the purpose of the present study.

**Table 3.2: List of extension personnel of selected blocks**

| <b>Blocks</b> | <b>No. of<br/>RAEO's</b> | <b>75%<br/>RAEO's<br/>were<br/>selected</b> | <b>No. of<br/>RHEO's</b> | <b>75%<br/>RHEO's<br/>were<br/>selected</b> | <b>Tot.<br/>res.</b> |
|---------------|--------------------------|---------------------------------------------|--------------------------|---------------------------------------------|----------------------|
| Rajnandgaon   | 38                       | 29                                          | 8                        | 6                                           | 35                   |
| Dongargaon    | 27                       | 20                                          | 2                        | 2                                           | 22                   |
| Khairagarh    | 28                       | 21                                          | 3                        | 2                                           | 23                   |
| Chowki        | 23                       | 17                                          | 3                        | 2                                           | 19                   |
| <b>Total</b>  | <b>116</b>               | <b>87</b>                                   | <b>16</b>                | <b>12</b>                                   | <b>99</b>            |

### 3.3 Selection of ICT tools

The ICT tools selected for the study were – mobile, computer, internet, telephone, teleconferencing, agricultural websites & portals, agriculture based mobile apps and laptop. Thus total 08 ICT tools were selected for the study.

### 3.4 Variables, their operationalization and measurement

| <b>S. No</b> | <b>Variables</b>               | <b>Measurement</b>                   |
|--------------|--------------------------------|--------------------------------------|
| <b>A.</b>    | <b>Independent variable</b>    |                                      |
| 1.           | Age                            | Actual chronological age             |
| 2.           | Education                      | No. of classes passed                |
| 3.           | Knowledge level                | Self – scoring                       |
| 4.           | Experience                     | No. of year of service               |
| 5.           | Training received on ICT tools | Self – scoring                       |
| 6.           | Job commitment                 | Procedure followed by Rao (2000)     |
| 7.           | Achievement motivation         | Procedure followed by Biradar (2008) |
| 8.           | Innovativeness                 | Scale developed by Moulik (1965)     |
| 9.           | Accessibility to ICT tools     | Self – scoring                       |
| <b>B.</b>    | <b>Dependent variable</b>      |                                      |
|              | Utilization pattern;           |                                      |
| 1.           | Extent of utilization          | Index developed                      |
| 2.           | Purpose of utilization         | Index developed                      |

## **Operationalization of the variables**

### **A. Independent variables**

#### **1. Age**

It was operationalized by considering the chronological age of the extension personnel in completed years at the time of investigation. The categories formulated as :

| <b>S.No.</b> | <b>Categories</b> | <b>Score</b>   |
|--------------|-------------------|----------------|
| 1.           | Young age         | Up to 35 years |
| 2.           | Middle age        | 36 to 50 years |
| 3.           | Old age           | Above 50 years |

#### **2. Education**

It was operationalized as the extent of formal education undergone by the extension personnel. The information pertaining to the formal education was collected by asking the respondents. The respondents were categorized into following five groups.

| <b>S.No.</b> | <b>Categories</b>                         | <b>Score</b> |
|--------------|-------------------------------------------|--------------|
| 1.           | Graduation in other science & allied sub. | 1            |
| 2.           | Graduation in agriculture science         | 2            |
| 3.           | Master in other science                   | 3            |
| 4.           | Master in agriculture science             | 4            |
| 5.           | Ph.D. in agriculture                      | 5            |

#### **3. Knowledge level**

English and English (1958) defined knowledge as a body of understood information possessed by an individual. Knowledge level of extension personnel was operationalized as the quantum of scientific information known to the respondents about the selected ICT tools.

The test constituted 07 knowledge questions which were provided with 3 alternative answers including correct answer. The knowledge test was administered to the respondents and was ask to underline/tick mark to the correct answer. Quantification of knowledge item answers was made by giving one score and zero score for correct and wrong answers respectively. The scores of all the individual items were summed to get knowledge score of the respondent. The summation of scores for a particular respondent indicated his knowledge level about ICT tools. The maximum score that one should get was 07 and the minimum was 0.

Based on the total score, the respondents were classified into three categories namely 'low', 'medium' and 'high' by using range of scores.

| <b>S.No.</b> | <b>Categories</b> | <b>Score</b> |
|--------------|-------------------|--------------|
| 1.           | Low               | Up to 2      |
| 2.           | Medium            | 3 to 5       |
| 3.           | High              | Above 5      |

#### **4. Experience**

It was operationalized as the number of years of service completed in performing his job at the time of investigation was considered as his experience. The respondents were classified into three categories namely 'low', 'medium' and 'high' by using range of scores.

| <b>S.No.</b> | <b>Categories</b> | <b>Score</b>   |
|--------------|-------------------|----------------|
| 1.           | Low               | Up to 11 years |
| 2.           | Medium            | 12 to 21 years |
| 3.           | High              | Above 21 years |

#### **5. Training received on ICT tools**

It refers to the training received by the respondents on ICT tools. A scoring of 1 and 0 was given to the respondents received training and not received respectively. The categories formulated as:

| <b>S.No.</b> | <b>Categories</b> | <b>Score</b> |
|--------------|-------------------|--------------|
| 1.           | Yes               | 1            |
| 2.           | No                | 0            |

#### **Duration of training**

| <b>S. No.</b> | <b>Duration</b> | <b>Score</b> |
|---------------|-----------------|--------------|
| 1.            | 1-5 days        | 1            |
| 2.            | 6-10 days       | 2            |
| 3.            | 11-15 days      | 3            |
| 4.            | 16-20 days      | 4            |
| 5.            | Above 20 days   | 5            |

#### **6. Job commitment**

It was conceptualized as the extent of dedication, devotion or adherence of extension personnel with a strong belief in accepting his existing job. The procedure followed by Rao (2000). This procedure has 10 statements among these 7 were positive statements and 3 statements (3<sup>rd</sup>, 4<sup>th</sup> and 6<sup>th</sup>) were negative. The response of each statement was obtained on five point continuum namely Strongly agree, Agree, Undecided, Disagree and Strongly disagree and weightage of 5, 4, 3, 2 and 1 were assigned to positive statements. Reverse weightage was given to the negative statements. The score ranged from 10 to 50. Based on the range of scores, the respondents were categorized into three groups as follows.

| <b>S. No.</b> | <b>Categories</b> | <b>Score</b> |
|---------------|-------------------|--------------|
| 1.            | Low               | 10 to 23     |
| 2.            | Medium            | 24 to 36     |
| 3.            | High              | 37 to 50     |

## **7. Achievement motivation**

It was operationally defined as the degree to excel regardless of social rewards. It was the desire to do well not so much for the sake of social recognition or prestige but to attain an inner feeling of personal accomplishment. The procedure followed by Biradar (2008) was used in the present study. This procedure has 6 statements in the form of questions. The questions 1, 4 and 6 were positive statements and other questions were negative statements. The response of each statement was obtained on three point continuum namely Agree, Undecided and Disagree and weightage of 2, 1 and 0 were assigned to positive statements. Reverse weightage was given to the negative statements. The score ranged from 0 to 12. Based on the range of scores, the respondents were categorized into three following groups.

| <b>S. No.</b> | <b>Categories</b> | <b>Score</b> |
|---------------|-------------------|--------------|
| 1.            | Low               | Up to 4      |
| 2.            | Medium            | 5 to 8       |
| 3.            | High              | Above 8      |

## **8. Innovativeness**

It refers to the behavioral pattern of an individual who has interest and desire to seek changes in farming techniques and ready to introduce such changes which are practical and feasible. For quantifying this variable, the scale developed by Moulik (1965). The scale consists of 9 statements. After obtaining the response as 'most like' and 'least like', a score of 2 was given to 'most like' and score 1 for 'least like' response was assigned. The final scoring was arrived by summing up the scores of 'most like' statements and 'least like' statements. The scores ranged from 9 to 18. Then, based on the total score, the respondents were classified into three following categories.

| <b>S. No.</b> | <b>Categories</b> | <b>Score</b> |
|---------------|-------------------|--------------|
| 1.            | Low               | 9 to 12      |
| 2.            | Medium            | 13 to 15     |
| 3.            | High              | 16 to 18     |

## **9. Accessibility to ICT tools**

It is operationalised as the degree to which an individual respondent is able to use ICTs or its applications for the purpose of agriculture and rural development. After obtaining the response as 'accessible' and 'not accessible', a score of 1 was given to 'accessible' and score 0 for 'not accessible' response was assigned. The score ranged from 1 to 8. On the basis of range of scores, three categories were developed as:-

| <b>S. No.</b> | <b>Categories</b> | <b>Score</b> |
|---------------|-------------------|--------------|
| 1.            | Low               | Up to 2      |
| 2.            | Medium            | 3 to 5       |
| 3.            | High              | Above 5      |

## **B. Dependent variable**

### **Utilization pattern;**

#### **1. Extent of utilization of ICT tools**

The extent of use of users of information communication technology services refers to the use of the various services by the user information communication technology services users in receiving information. The responses were recorded on four - point continuum as very frequently, frequently, rarely, not at all and were given 3, 2, 1 and 0 scores respectively. An individual can obtain a maximum of 24 scores and minimum of 0. Total score obtained was

calculated by summing the obtained score of individual information, which were used to know the extent of use.

$$\text{Extent of use index} = \text{Obtained Score} / \text{Obtainable Score} \times 100$$

On the basis of index, the extent of use of respondents was classified into following three categories with the help of range of scores.

| <b>S. No.</b> | <b>Categories</b> | <b>Score</b> |
|---------------|-------------------|--------------|
| 1.            | Low               | Up to 8      |
| 2.            | Medium            | 9 to 16      |
| 3.            | High              | Above 16     |

## **2. Purpose of utilization of ICT tools**

The scoring pattern of purpose of utilization was classified under following categories.

| <b>Categories</b>                              | <b>Score</b> |
|------------------------------------------------|--------------|
| For gaining the knowledge / recent information | 5            |
| For transfer of technology                     | 4            |
| For training / teaching                        | 3            |
| For making and sending reports                 | 2            |
| For organizational communication               | 1            |

$$\text{Utilization Index} = \text{Obtained Scores} / \text{Obtainable Score} \times 100$$

## **3.5 Instrument and method of data collection**

### **Instrument of data collection**

The interview schedule was used to as an instrument for data collection, which was prepared on the basis of objectives and various variables considered in the present study.

## **Method of data collection**

Data were collected through personal interview with the help of well structured interview schedule.

### **3.6 Statistical tools used**

#### **1. Frequency**

This measure was used to know the distribution pattern of extension personnel variable wise and to categorize the problems perceived and suggestions given by the extension personnel in order of importance.

#### **2. Percentage**

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

$$P = X / N \times 100$$

Where,

P = Percentage

X = Frequencies of respondents

N = Total number of respondents

#### **3. Range**

Range is the statistical measurement to represent the minimum and maximum score of a category. It was used for the base of categorization of each variable.

$$\text{Range} = \text{Maximum Score} - \text{Minimum Score} / \text{No. of categories}$$

#### **4. Correlation analysis**

To study the association between independent variable of the extension personnel with their utilization pattern of ICT tools, the values of correlation coefficient were worked out by using following formula,

$$r = \frac{CoV(x,y)}{\sqrt{V(x) \times V(y)}}$$

Where,

$r_{xy}$  = correlation coefficient between character x and y

CoV (x,y) = co-variance of character x and y

$V(x)$  = variance of character x

$V(y)$  = variance of character y

### **3.7 Derivation of hypotheses**

On the basis of objectives and variables incorporated the study, the following null hypotheses were formulated for the study.

1. There is no significant association between age of extension personnel and their extent of utilization of ICT tools.
2. There is no significant association between education of extension personnel and their extent of utilization of ICT tools.
3. There is no significant association between knowledge level of extension personnel and their extent of utilization of ICT tools.
4. There is no significant association between experience of extension personnel and their extent of utilization of ICT tools.
5. There is no significant association between training received on ICT tools by the extension personnel and their extent of utilization of ICT tools.
6. There is no significant association between job commitment of extension personnel and their extent of utilization of ICT tools.
7. There is no significant association between achievement motivation of extension personnel and their extent of utilization of ICT tools.

8. There is no significant association between innovativeness of extension personnel and their extent of utilization of ICT tools.
9. There is no significant association between accessibility to ICT tools by the extension personnel and their extent of utilization of ICT tools.
10. There is no significant association between age of extension personnel and their purpose of utilization of ICT tools.
11. There is no significant association between education of extension personnel and their purpose of utilization of ICT tools.
12. There is no significant association between knowledge level of extension personnel and their purpose of utilization of ICT tools.
13. There is no significant association between experience of extension personnel and their purpose of utilization of ICT tools.
14. There is no significant association between training received on ICT tools by the extension personnel and their purpose of utilization of ICT tools.
15. There is no significant association between job commitment of extension personnel and their purpose of utilization of ICT tools.
16. There is no significant association between achievement motivation of extension personnel and their purpose of utilization of ICT tools.

17. There is no significant association between innovativeness of extension personnel and their purpose of utilization of ICT tools.
18. There is no significant association between accessibility to ICT tools by the extension personnel and their purpose of utilization of ICT tools.

## RESULTS

This chapter deals with the analysis and interpretation of collected data, which were collected from the sample of 99 extension personnel. The data were processed keeping in view of the following objectives as:-

1. To know the socio – economic profile of extension personnel using ICT tools.
2. To study the accessibility to ICT tools by the extension personnel.
3. To ascertain the utility pattern of ICT tools for transfer of technology (TOT) by the extension personnel.
4. To find out the association between independent and dependent variables.
5. To enumerate the constraints faced by the extension personnel and their suggestions in utilization of ICT tools.

### I. Profile of extension personnel

#### 1. Age

**Table 4.1 : Distribution of extension personnel according to age**

| S. No. | Categories              | Frequency | Percentage |
|--------|-------------------------|-----------|------------|
| 1.     | Young (Up to 35 years)  | 40        | 40.40      |
| 2.     | Middle (36 to 50 years) | 35        | 35.36      |
| 3.     | Old (Above 50 years)    | 24        | 24.24      |
| Total  |                         | 99        | 100.00     |

Table 4.1 reveals that out of total extension personnel, 40.40 per cent extension personnel were of young age group; followed by middle age (35.36%) and old age (24.24 %).

Thus, it can be concluded that higher percentage of extension personnel (40.40 %) were of young age group.

## 2. Education

**Table 4.2: Distribution of extension personnel according to their education**

| S. No. | Categories                                | Frequency | Percentage |
|--------|-------------------------------------------|-----------|------------|
| 1.     | Graduation in other science & allied sub. | 21        | 21.21      |
| 2.     | Graduation in agriculture science         | 52        | 52.53      |
| 3.     | Master in other science                   | 06        | 06.06      |
| 4.     | Master in agriculture science             | 18        | 18.18      |
| 5.     | Ph. D. in agriculture                     | 02        | 02.02      |
| Total  |                                           | 99        | 100.00     |

The data of the table 4.2 reveals that out of the total extension personnel, 52.53 per cent of the respondents received education up to graduation in agri. Science, followed by graduation in other science & allied sub. (21.21%), master in agri. science (18.18%), master in other science (06.06%) and 02.02 per cent were Ph.D. in agriculture.

Thus, it can be concluded that higher percentage of extension personnel (52.53 %) were of graduate in agriculture science.

## 3. Knowledge level

**Table 4.3: Distribution of extension personnel according to their knowledge level about ICT tools**

| S. No. | Categories      | Frequency | Percentage |
|--------|-----------------|-----------|------------|
| 1.     | Low (Up to 2)   | 12        | 12.12      |
| 2.     | Medium (3 to 5) | 40        | 40.40      |
| 3.     | High (Above 5)  | 47        | 47.48      |
| Total  |                 | 99        | 100.00     |

The data of the table 4.3 reveals that out of the total extension personnel, 47.48 percent extension personnel were having high knowledge level about ICT tools, followed by medium knowledge level (40.40%) and 12.12 percent were having low knowledge level.

Thus, it may be concluded that higher percentage (47.48%) of extension personnel were having high knowledge level about ICT tools.

#### 4. Experience

**Table 4.4: Distribution of extension personnel according to their experience**

| S. No. | Categories              | Frequency | Percentage |
|--------|-------------------------|-----------|------------|
| 1.     | Low (Up to 11 years)    | 69        | 69.70      |
| 2.     | Medium (12 to 21 years) | 20        | 20.20      |
| 3.     | High (Above 21 years)   | 10        | 10.10      |
| Total  |                         | 99        | 100.00     |

The data of the table 4.4 reveals that out of the total extension personnel, 69.70 per cent extension personnel were having low experiences of job, followed by medium experiences (20.20%) and 10.10 per cent were having high experiences of job.

Thus it may be concluded that highest (69.70%) extension personnel were having low experience.

#### 5. Training received on ICT tools

**Table 4.5 : Distribution of extension personnel according to training received on ICT tools**

| S. No. | Categories | Frequency | Percentage |
|--------|------------|-----------|------------|
| 1.     | Yes        | 65        | 65.66      |
| 2.     | No         | 34        | 34.34      |
| Total  |            | 99        | 100.00     |

The data of the table 4.5 reveals that out of the 99 extension personnel, 65.66 percent extension personnel were training received on ICT tools and 34.34 percent were not received any training on ICT tools.

**Table 4.6 : Distribution of extension personnel according to duration of training**

| S. No. | Duration      | Frequency | Percentage |
|--------|---------------|-----------|------------|
| 1.     | 1 – 5 days    | 06        | 06.06      |
| 2.     | 6 – 10 days   | 50        | 50.51      |
| 3.     | 11 – 15 days  | 02        | 02.02      |
| 4.     | 16 – 20 days  | 02        | 02.02      |
| 5.     | Above 20 days | 05        | 05.05      |
| Total  |               | 65        | 65.66      |

The results depicted in table 4.6 indicated that, 50.51 per cent of extension personnel received training on ICT tools for 6 – 10 days duration followed by 06.06 per cent for 1 – 5 days, 05.05 per cent for above 20 days, 02.02 per cent for 11 – 15 days and 02.02 per cent for 16 – 20 days duration respectively.

## **6. Job commitment**

**Table 4.7: Distribution of extension personnel according to their job commitment**

| S. No. | Categories        | Frequency | Percentage |
|--------|-------------------|-----------|------------|
| 1.     | Low (10 to 23)    | 18        | 18.18      |
| 2.     | Medium (24 to 36) | 53        | 53.54      |
| 3.     | High (37 to 50)   | 28        | 28.28      |
| Total  |                   | 99        | 100.00     |

The data of the table 4.7 reveals that out of the 99 respondents, 53.54 per cent were having medium job commitment, followed by high job

commitment (28.28%) and only 18.18 per cent of respondents having low job commitment.

Thus, it may be concluded that higher percentage (53.54%) of extension personnel were having medium job commitment.

## 7. Achievement motivation

**Table 4.8: Distribution of extension personnel according to their achievement motivation**

| S. No. | Categories      | Frequency | Percentage |
|--------|-----------------|-----------|------------|
| 1.     | Low (0 to 4)    | 02        | 02.02      |
| 2.     | Medium (5 to 8) | 51        | 51.52      |
| 3.     | High (9 to 12)  | 46        | 46.46      |
| Total  |                 | 99        | 100.00     |

The data of the table 4.8 reveals that out of the 99 respondents, 51.52 per cent were having medium achievement motivation, followed by high (46.46%) and 02.02 per cent of respondents having low achievement motivation.

Thus, it may be concluded that higher percentage (51.52%) of extension personnel were having medium achievement motivation.

## 8. Innovativeness

**Table 4.9: Distribution of extension personnel according to their innovativeness**

| S. No. | Categories        | Frequency | Percentage |
|--------|-------------------|-----------|------------|
| 1.     | Low (9 to 12)     | 41        | 41.41      |
| 2.     | Medium (13 to 15) | 52        | 52.53      |
| 3.     | High (16 to 18)   | 06        | 06.06      |
| Total  |                   | 99        | 100.00     |

Table 4.9 indicates that out of the total respondents, 52.53 per cent extension personnel were having medium innovativeness, followed by low innovativeness (41.41%) and only 06.06 per cent of the extension personnel were having high innovativeness.

Thus, it can be concluded that the higher percentage (52.53 %) of extension personnel were having medium innovativeness.

## **2. Accessibility to ICT tools by the extension personnel**

**Table 4.10: Overall distribution of extension personnel according to their accessibility to ICT tools**

| <b>S. No.</b> | <b>Categories</b> | <b>Frequency</b> | <b>Percentage</b> |
|---------------|-------------------|------------------|-------------------|
| 1.            | Low (Up to 2)     | 26               | 26.26             |
| 2.            | Medium (3 to 5)   | 63               | 63.64             |
| 3.            | High (Above 5)    | 10               | 10.10             |
| Total         |                   | 99               | 100.00            |

The data of the table 4.10 reveals that out of the 99 extension personnel, 63.64 per cent were having medium accessibility to ICT tools followed by 26.26 per cent were low and 10.10 per cent of extension personnel were having high accessibility to ICT tools.

Thus, it may be concluded that higher percentage (63.64%) of extension personnel were having medium accessibility to ICT tools.

**Table 4.11 : Distribution of extension personnel according to their accessibility to individual ICT tools**

| <b>S. No.</b> | <b>ICT tools</b>        | <b>Accessible</b> | <b>Not accessible</b> |
|---------------|-------------------------|-------------------|-----------------------|
| 1.            | Mobile                  | 99<br>(100 %)     | 0<br>(0.00 %)         |
| 2.            | Computer                | 55<br>(55.56 %)   | 44<br>(44.44 %)       |
| 3.            | Internet                | 70<br>(70.71 %)   | 29<br>(29.29 %)       |
| 4.            | Telephone               | 20<br>(20.20 %)   | 79<br>(79.80 %)       |
| 5.            | Teleconferencing        | 17<br>(17.17 %)   | 82<br>(82.83 %)       |
| 6.            | Agri. website & portals | 65<br>(65.66 %)   | 34<br>(34.34 %)       |
| 7.            | Agri. based mobile apps | 55<br>(55.56 %)   | 44<br>(44.44 %)       |
| 8.            | Laptop                  | 60<br>(60.61 %)   | 39<br>(39.39 %)       |
|               | Other                   | —                 | —                     |

A perusal of table 4.11 also revealed the accessibility to ICT tools by the extension personnel in the order of priority were; mobile (100 %) were “Accessible” followed by internet (70.71%), agri. website & portals (65.66%), laptop (60.61%), computer and agri. based mobile apps are (55.56%), telephone (20.20 %) and teleconferencing (17.17%).

Further, the data reveals that, some of the tools “Not accessible” were teleconferencing (82.83%), telephone (79.80%), computer and agri. based mobile apps were (44.44%), laptop (39.39%), agri. website & portals (34.34 %), internet (29.29%) and mobile were (0.00 %).

### **3. The utility pattern of ICT tools for transfer of technology (TOT) by the extension personnel**

#### **1. Extent of utilization**

**Table 4.12 : Overall distribution of extension personnel according to their extent of utilization**

| <b>S.N</b> | <b>Categories</b> | <b>Frequency</b> | <b>Percentage</b> |
|------------|-------------------|------------------|-------------------|
| 1          | Low (Up to 8)     | 33               | 33.33             |
| 2          | Medium (9 to 16)  | 58               | 58.59             |
| 3          | High (Above 16)   | 08               | 08.08             |
| Total      |                   | 99               | 100.00            |

The data of above table 4.12 indicates that out of the total respondents, 58.59 per cent had medium extent of utilization, followed by (33.33%) had low and 08.08 per cent of extension personnel had high extent of utilization.

Thus, it can be concluded that the higher percentage (58.59%) of extension personnel had medium extent of utilization of ICT tools.

**Table 4.13 : Distribution of extension personnel according to their extent of utilization of individual ICT tools**

| <b>S. No.</b> | <b>ICT tools</b>        | <b>Very frequently</b> | <b>Frequently</b> | <b>Less frequently</b> | <b>Not at all</b> |
|---------------|-------------------------|------------------------|-------------------|------------------------|-------------------|
| 1.            | Mobile                  | 68<br>(68.69%)         | 28<br>(28.28%)    | 03<br>(03.03%)         | 0<br>(0.00%)      |
| 2.            | Computer                | 15<br>(15.15%)         | 30<br>(30.30%)    | 10<br>(10.10%)         | 44<br>(44.45%)    |
| 3.            | Internet                | 45<br>(45.45%)         | 15<br>(15.15%)    | 10<br>(10.10%)         | 29<br>(29.30%)    |
| 4.            | Telephone               | 0<br>(0.00%)           | 09<br>(09.09%)    | 11<br>(11.11%)         | 79<br>(79.80%)    |
| 5.            | Teleconferencing        | 0<br>(0.00%)           | 7<br>(07.07%)     | 10<br>(10.10%)         | 82<br>(82.83%)    |
| 6.            | Agri. website & portals | 20<br>(20.20%)         | 30<br>(30.30%)    | 15<br>(15.15%)         | 34<br>(34.35%)    |
| 7.            | Agri. based mobile apps | 17<br>(17.17%)         | 23<br>(23.23%)    | 15<br>(15.15%)         | 44<br>(44.45%)    |
| 8.            | Laptop                  | 20<br>(20.20%)         | 30<br>(30.30%)    | 10<br>(10.10%)         | 39<br>(39.40%)    |
|               | Other                   | —                      | —                 | —                      | —                 |

A perusal of table 4.13 also revealed the extent of utilization of ICT tools by the extension personnel in the order of priority were; mobile (68.69 %) was “Very frequently” followed by internet (45.45%), agri. website & portals and laptop were (20.20%), agri.

based mobile apps (17.17%), computer (15.15%), telephone and teleconferencing were (0.00%).

Whereas, “Frequently” extent of utilization were computer, agri. website & portals and laptop (30.30%), mobile (28.28%), agri. based mobile apps (23.23%), internet (15.15%), telephone (09.09%) and teleconferencing (07.07%).

While, “Less frequently” extent of utilization were agri website & portals (15.15 %), agri. based mobile apps (15.15%), telephone (11.11%), computer (10.10%), internet (10.10%), teleconferencing (10.10%), laptop (10.10%) and mobile were (03.03%).

Further, the data reveals that, some of the tools “Not at all” were teleconferencing (82.83%), telephone (79.80%), computer and agri. based mobile apps (44.45%), laptop (39.40%), agri. website & portals (34.35%), internet (29.30%) and mobile were (0.00%).

Total 65.66% extension personnel were mostly using agri. website & portals were – FARMERS’ PORTAL (<https://farmer.gov.in>), agropedia (agropedia.iitk.ac.in), TNAU AGRITECH PORTAL (agritech.tnau.ac.in), Soil Health Card (<https://soilhealth.dac.gov.in>), DEPARTMENT OF AGRICULTURE, COOPERATION & FARMERS WELFARE (agricoop.nic.in), <https://revenue.cg.nic.in> , cg.nic.in/agrisubsidy/, and CHAMPS (champs.cgstate.gov.in).

And total 55.56% extension personnel were mostly using agri. based mobile apps were – MyAgriGuru – Agriculture app for Indian farmers, Plantix – grow smart, IFFCO Kisan – Agriculture App.

## 2. Purpose of utilization

**Table 4.14: Purpose of utilization of ICT tools by the extension personnel**

| S. No . | ICT tools               | For gaining the knowledge/ recent information | For transfer of technology | For training/ teaching | For making/ sending reports | For organizational communication |
|---------|-------------------------|-----------------------------------------------|----------------------------|------------------------|-----------------------------|----------------------------------|
| 1.      | Mobile                  | 80<br>(80.81%)                                | 78<br>(78.79%)             | 45<br>(45.45%)         | 65<br>(65.66 %)             | 85<br>(85.86%)                   |
| 2.      | Computer                | 20<br>(20.20%)                                | 25<br>(25.25%)             | 18<br>(18.18%)         | 30<br>(30.30%)              | 22<br>(22.22%)                   |
| 3.      | Internet                | 68<br>(68.69%)                                | 64<br>(64.65%)             | 65<br>(65.66%)         | 60<br>(60.61%)              | 66<br>(66.67%)                   |
| 4.      | Telephone               | 14<br>(14.14 %)                               | 15<br>(15.15 %)            | 0<br>(0.00 %)          | 0<br>(0.00 %)               | 16<br>(16.16 %)                  |
| 5.      | Teleconferencing        | 0<br>(0.00 %)                                 | 0<br>(0.00 %)              | 08<br>(08.08%)         | 0<br>(0.00 %)               | 10<br>(10.10%)                   |
| 6.      | Agri. website & portals | 60<br>(60.61%)                                | 55<br>(55.56%)             | 50<br>(50.51%)         | 0<br>(0.00 %)               | 0<br>(0.00 %)                    |
| 7.      | Agri. based mobile apps | 53<br>(53.54%)                                | 45<br>(45.45%)             | 50<br>(50.51%)         | 0<br>(0.00 %)               | 0<br>(0.00 %)                    |
| 8.      | Laptop                  | 12<br>(12.12%)                                | 40<br>(40.40%)             | 55<br>(55.56%)         | 35<br>(35.35%)              | 45<br>(45.45%)                   |
|         | Other                   | —                                             | —                          | —                      | —                           | —                                |

A perusal of table 4.14 also revealed the purpose of utilization of ICT tools by the extension personnel in the order of priority were; “gaining the knowledge/ recent information” the tools used were;

mobile (80.81%), internet (68.69%), agri. website & portals (60.61%), agri. based mobile apps (53.54%), computer (20.20%), telephone (14.14%), laptop (12.12%) and teleconferencing were (0.00%).

Whereas, the tools used for the purpose of “transfer of technology” were; mobile (78.79%), internet (64.65%), agri. website & portals (55.56%), agri. based mobile apps (45.45%), laptop (40.40%), computer (25.25%), telephone (15.15%) and teleconferencing were (0.00%).

Further, the ICT tools used to the purpose of “training and teaching” were; internet (65.66%), laptop (55.56%), agri. website & portals and agri. based mobile apps were (50.51%), mobile (45.45%), computer (18.18%), teleconferencing (08.08%) and telephone were (0.00%).

The tools used for the purpose of “making/ sending reports” were; mobile (65.66%), internet (60.61 %), laptop (35.35%), computer (30.30%), telephone, teleconferencing, agri. website & portals and agri. based mobile apps were (0.00 %).

The tools used for the purpose of “organisational communication” were; mobile (85.86%), internet (66.67%), laptop (45.45%), computer (22.22%), telephone (16.16%), teleconferencing (10.10%), agri. website & portals and agri. based mobile apps were (0.00 %).

#### 4. Association between independent and dependent variables

**Table 4.15 : Association between profile of extension personnel and extent of utilization of ICT tools**

| <b>Independent variables</b>   | <b>Correlation coefficient 'r'</b> |
|--------------------------------|------------------------------------|
| Age                            | 0.232*                             |
| Education                      | 0.351**                            |
| Knowledge level                | 0.419**                            |
| Experience                     | -0.186NS                           |
| Training received on ICT tools | 0.490**                            |
| Accessibility to ICT tools     | 0.644**                            |
| Job commitment                 | 0.313*                             |
| Achievement motivation         | 0.336**                            |
| Innovativeness                 | 0.317**                            |

\*\* Significant at 0.01 level

\* Significant at 0.05 level

NS – Non significant

The data presented in table 4.15 reveal that the age (0.232\*), education (0.351\*\*), knowledge level (0.419\*\*), training received on ICT tools (0.490\*\*), accessibility to ICT tools (0.644\*\*), job commitment (0.313\*), achievement motivation (0.336\*\*) and innovativeness (0.317\*\*) were found to have positively correlated and significantly associated with extent of utilization of ICT tools by the extension personnel.

While experience (-0.186NS) was found to have negatively and non-significantly associated with extent of utilization of ICT tools by the extension personnel.

**Table 4.16: Association between profile of extension personnel and purpose of utilization of ICT tools**

| <b>Independent variables</b>   | <b>Correlation coefficient 'r'</b> |
|--------------------------------|------------------------------------|
| Age                            | 0.345**                            |
| Education                      | 0.213*                             |
| Knowledge level                | 0.547**                            |
| Experience                     | -0.107NS                           |
| Training received on ICT tools | 0.237*                             |
| Accessibility to ICT tools     | 0.282**                            |
| Job commitment                 | 0.403**                            |
| Achievement motivation         | 0.283**                            |
| Innovativeness                 | 0.289**                            |

\*\* Significant at 0.01 level

\* Significant at 0.05 level

NS – Non- significant

The data presented in table 4.16 reveal that the age (0.345\*\*), education (0.213\*), knowledge level (0.547\*\*), training received on ICT tools (0.237\*), accessibility to ICT tools (0.282\*\*), job commitment (0.403\*\*), achievement motivation (0.283\*\*) and innovativeness (0.289\*\*) were found to have positively correlated and significantly associated with purpose of utilization of ICT tools by the extension personnel.

While experience (-0.107NS) was found to have negatively and non-significantly associated with purpose of utilization of ICT tools by the extension personnel.

Association between experience and utilization pattern (extent and purpose) of ICT tools by the extension personnel was found to have negative and non – significant. Young age or newly joined extension functionaries have exposures towards more modern information and communication technology tools. Better perception and comprehension could be observed among youth than other senior functionaries. We found that there have negative and non- significant association between experience of extension personnel with the utilization of ICT tools because utilization is the purely depend on the knowledge and exposure about ICT tools.

#### **5.(A) Constraints faced by the extension personnel in utilization of ICT tools.**

The respondents were asked to express the constraints faced by the extension personnel in utilization of ICT tools. The major problems faced by them have been presented in table 4.17

**Table 4.17: Constraints faced by the respondents in utilization of ICT tools**

| <b>S. No.</b> | <b>Constraints</b>               | <b>Frequency</b> | <b>Percentage</b> | <b>Rank</b> |
|---------------|----------------------------------|------------------|-------------------|-------------|
| <b>A.</b>     | <b>General constraints</b>       |                  |                   |             |
| 1.            | Lack of proper training facility | 34               | 34.34             | II          |
| 2.            | Insufficient power supply        | 08               | 08.08             | IV          |
| 3.            | Network problem                  | 29               | 29.29             | III         |
| 4.            | Lack of knowledge                | 50               | 50.51             | I           |
| <b>B.</b>     | <b>Physiological constraints</b> |                  |                   |             |
| 1.            | Eye fatigue                      | 36               | 36.36             | I           |
| 2.            | Back ache                        | 18               | 18.18             | III         |
| 3.            | Head ache                        | 34               | 34.34             | II          |
| 4.            | Wrist pain                       | 07               | 07.07             | V           |
| 5.            | Shoulder pain                    | 15               | 15.15             | IV          |

The data of table 4.17 represent the problems faced by the extension personnel in utilization of ICT tools.

The general problems faced by extension personnel were - the first major problem reported by 50.51 per cent respondents was lack of knowledge ranked I, the second major problem reported by 34.34 per cent respondents was lack of proper training facility ranked II, the third problem reported by 29.29 per cent respondents was network problem ranked III, and the fourth problem reported by 08.08 per cent respondents was insufficient power supply ranked IV.

Whereas in the case of physiological problems faced by extension personnel, the first major problem reported by 36.36 per cent respondents was eye fatigue ranked I, the second major problem reported by 34.34 per cent respondents was head ache ranked II, the third problem reported by 18.18 per cent respondents was back ache ranked III, the fourth problem reported by 15.15 per cent respondents was shoulder pain ranked IV and the fifth problem reported by 07.07 per cent respondents was wrist pain ranked V.

**(B) Suggestions expressed by the extension personnel in utilization of ICT tools.**

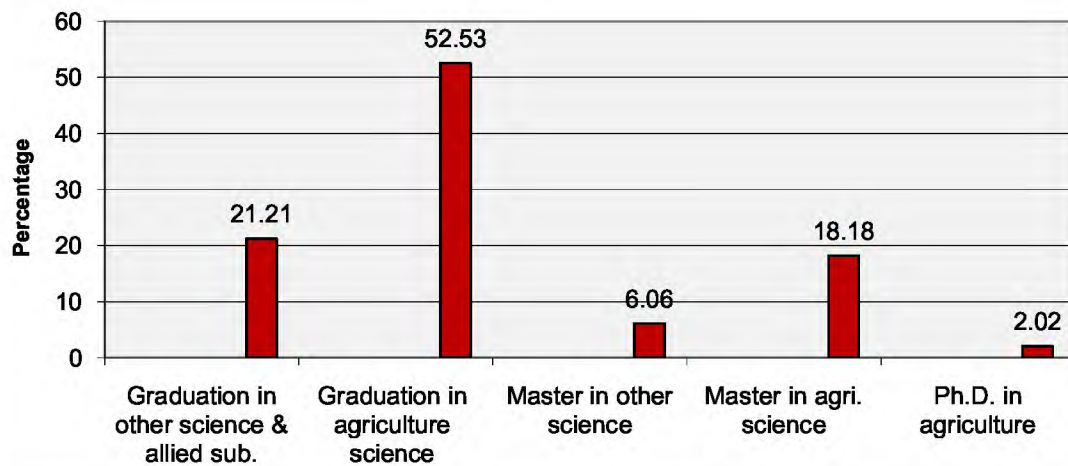
The respondents were asked to offer suggestions for enhancing its utility and applicability for agricultural and allied technology through ICT tools. Out of many suggestions offered by the respondents, the important suggestions surfaced have been presented in the table 4.18

**Table 4.18: Suggestions expressed by the extension personnel in utilization of ICT tools**

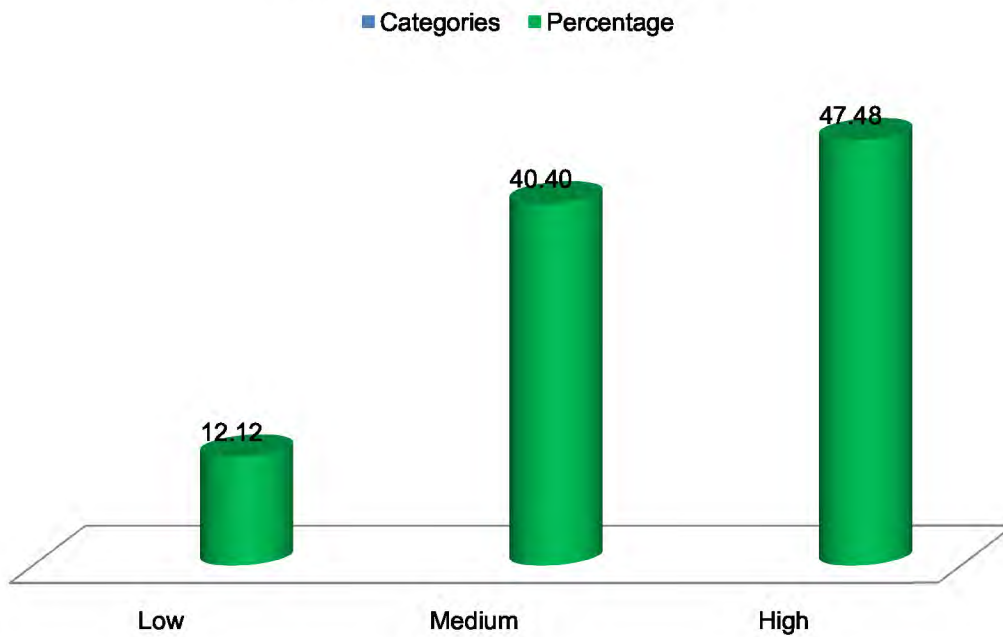
| <b>S. NO.</b> | <b>Suggestions</b>                                                           | <b>Frequency</b> | <b>Percentage</b> | <b>Rank</b> |
|---------------|------------------------------------------------------------------------------|------------------|-------------------|-------------|
| 1.            | Provide proper training facilities of extension workers about ICT tools.     | 34               | 34.34             | I           |
| 2.            | Proper coverage of network                                                   | 29               | 29.29             | II          |
| 3.            | Information regarding resources/ inputs availability should also be provided | 16               | 16.16             | III         |
| 4.            | Provide sufficient power supply facilities in rural areas.                   | 08               | 08.08             | IV          |

The data of table 4.18 indicated that 34.34 per cent respondents suggested that provide proper training facilities of extension workers about ICT tools was ranked I, followed by proper coverage of network (29.29%) ranked II, information regarding resources/ inputs availability should also be provided (16.16 %) ranked III, provide sufficient power supply facilities in rural areas (08.08 %) ranked IV.

**Fig 4.2 Distribution of extension personnel according to their education**

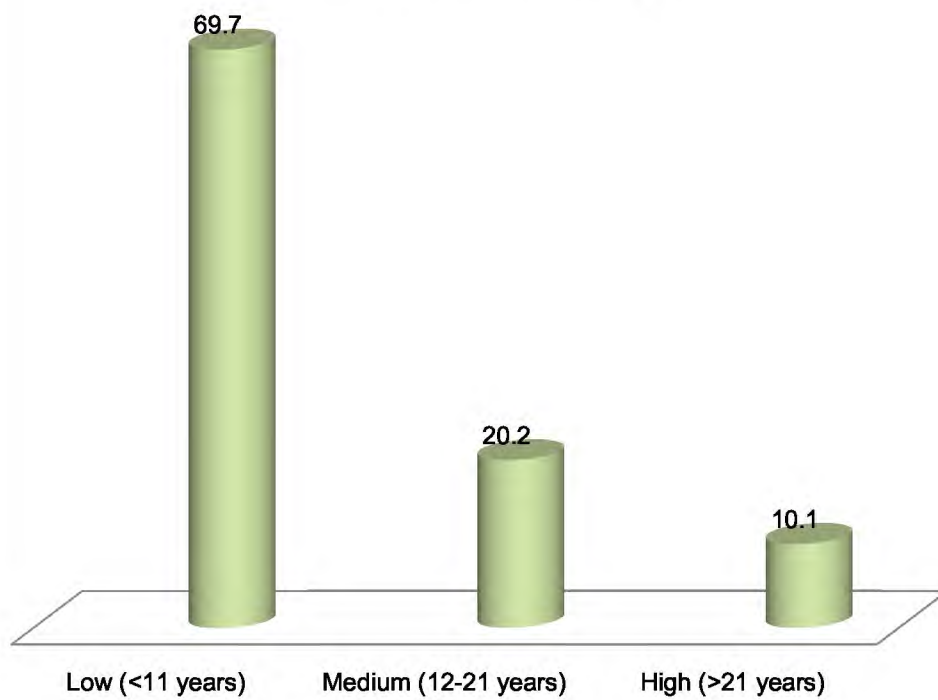


**Fig 4.3 Distribution of extension personnel according to their knowledge level about ICT tools**

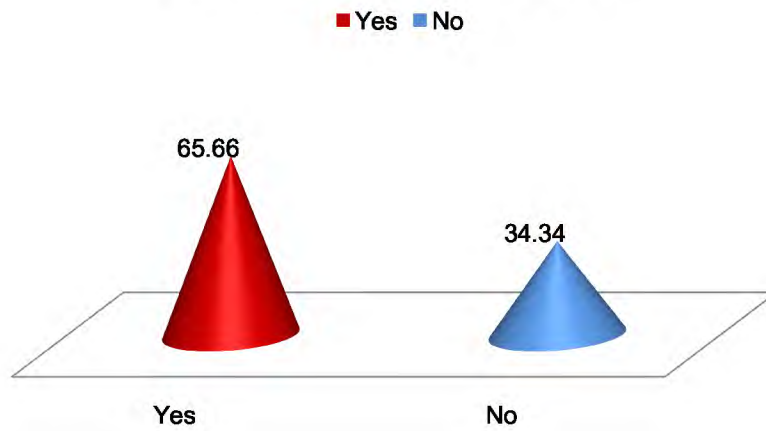


**Fig 4.4 Distribution of extension personnel according to their experience**

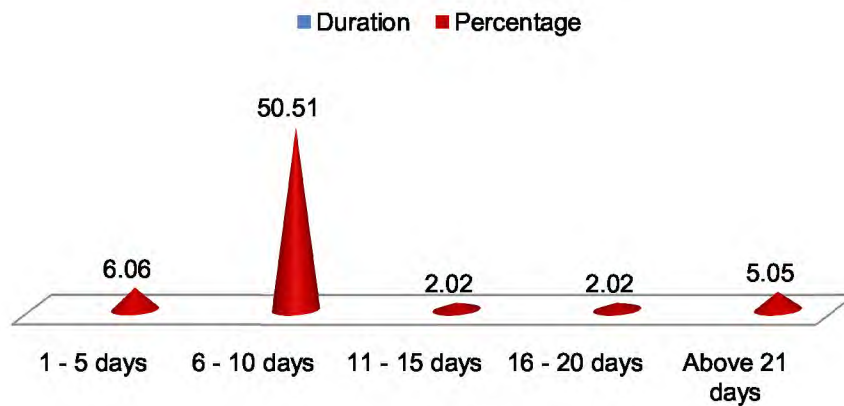
■ Categories ■ Percentage



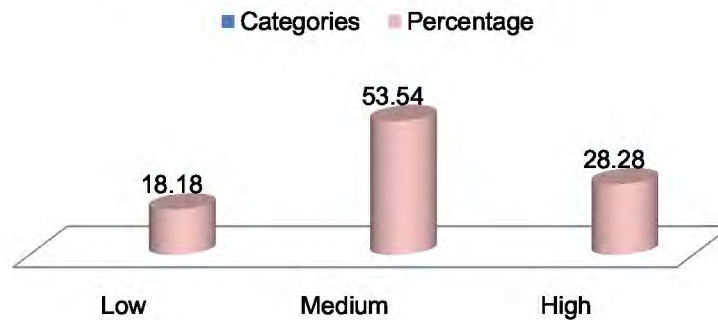
**Fig 4.5 Distribution of extension personnel according to training received on lct tools**



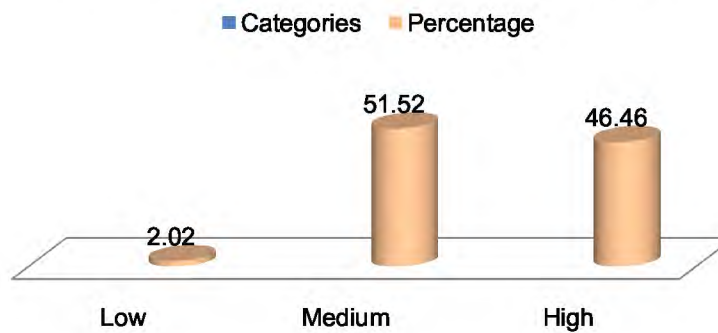
**Fig 4.6 Distribution of extension personnel according to duration of training**



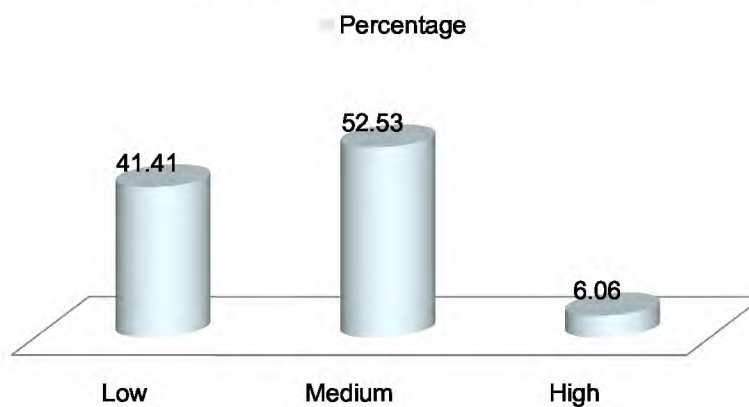
**Fig 4.7 Distribution of extension personnel according to their job commitment**



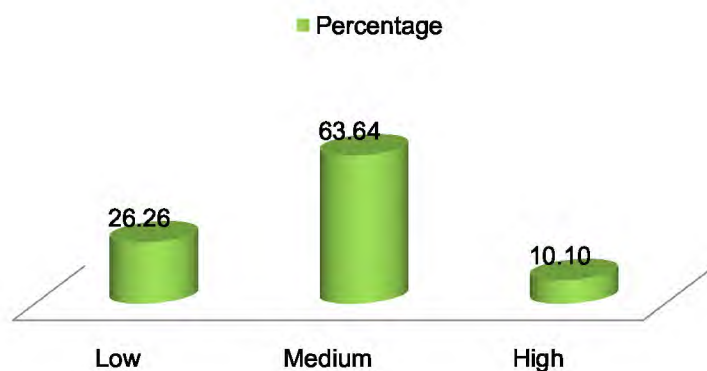
**Fig 4.8 Distribution of extension personnel according to their achievement motivation**



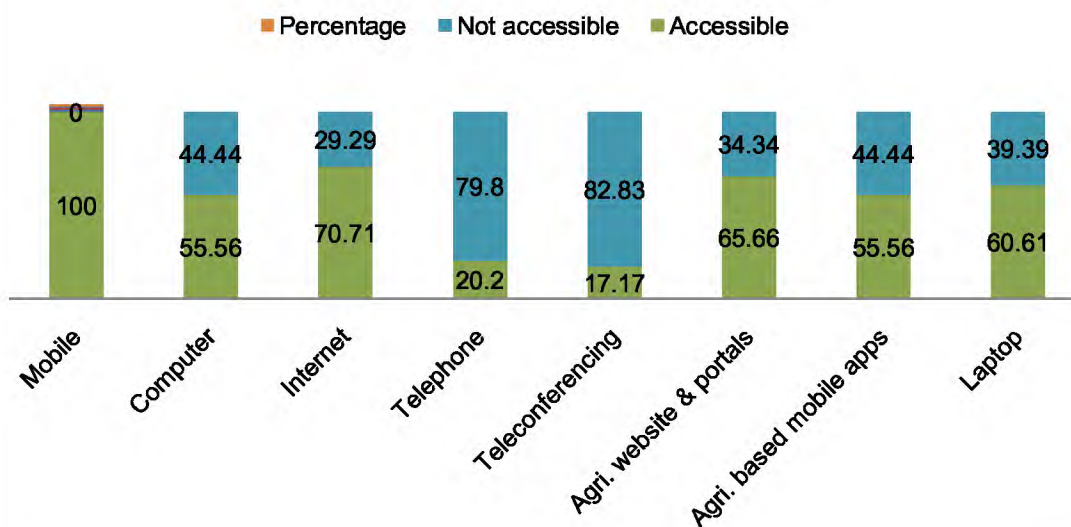
**Fig 4.9 Distribution of extension personnel according to their innovativeness**



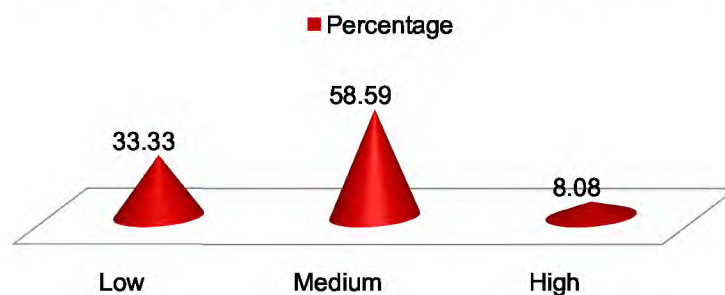
**Fig 4.10 Overall distribution of extension personnel according to their accessibility to ICT tools**



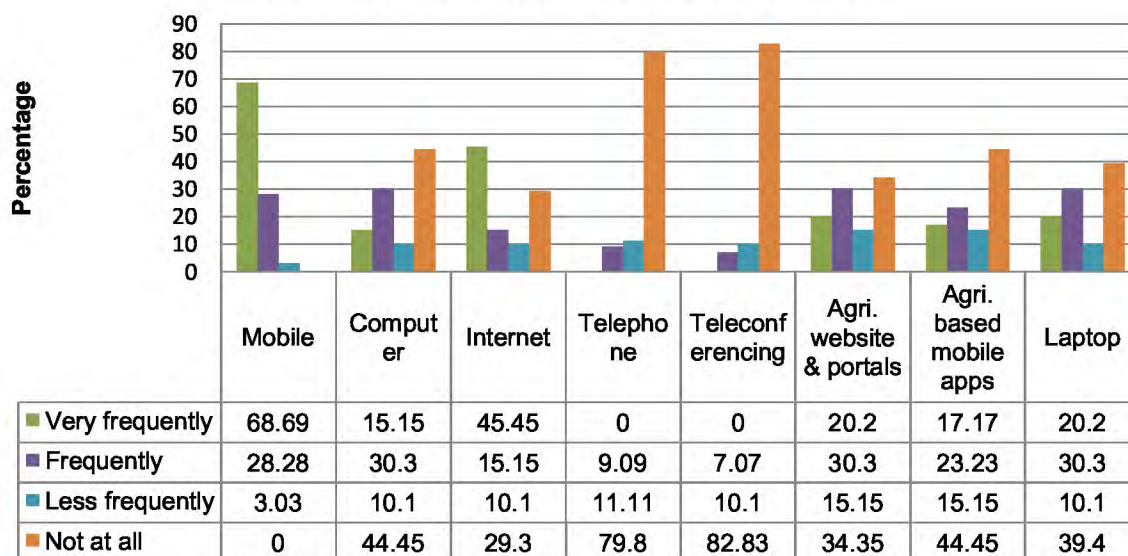
**Fig 4.11 Distribution of extension personnel according to their accessibility to Individual ICT tools**



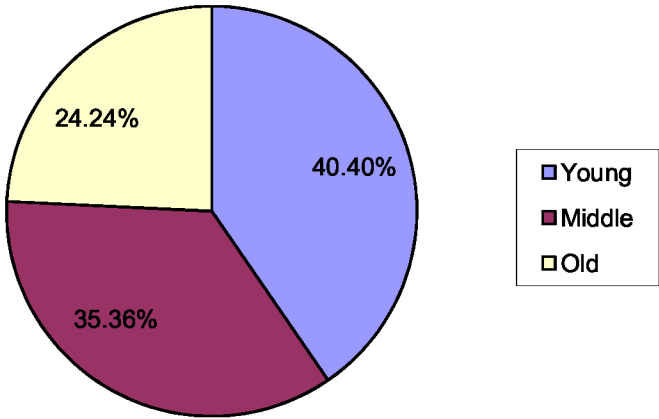
**Fig 4.12 Overall distribution of extension personnel according to their extent of utilization of ICT tools**



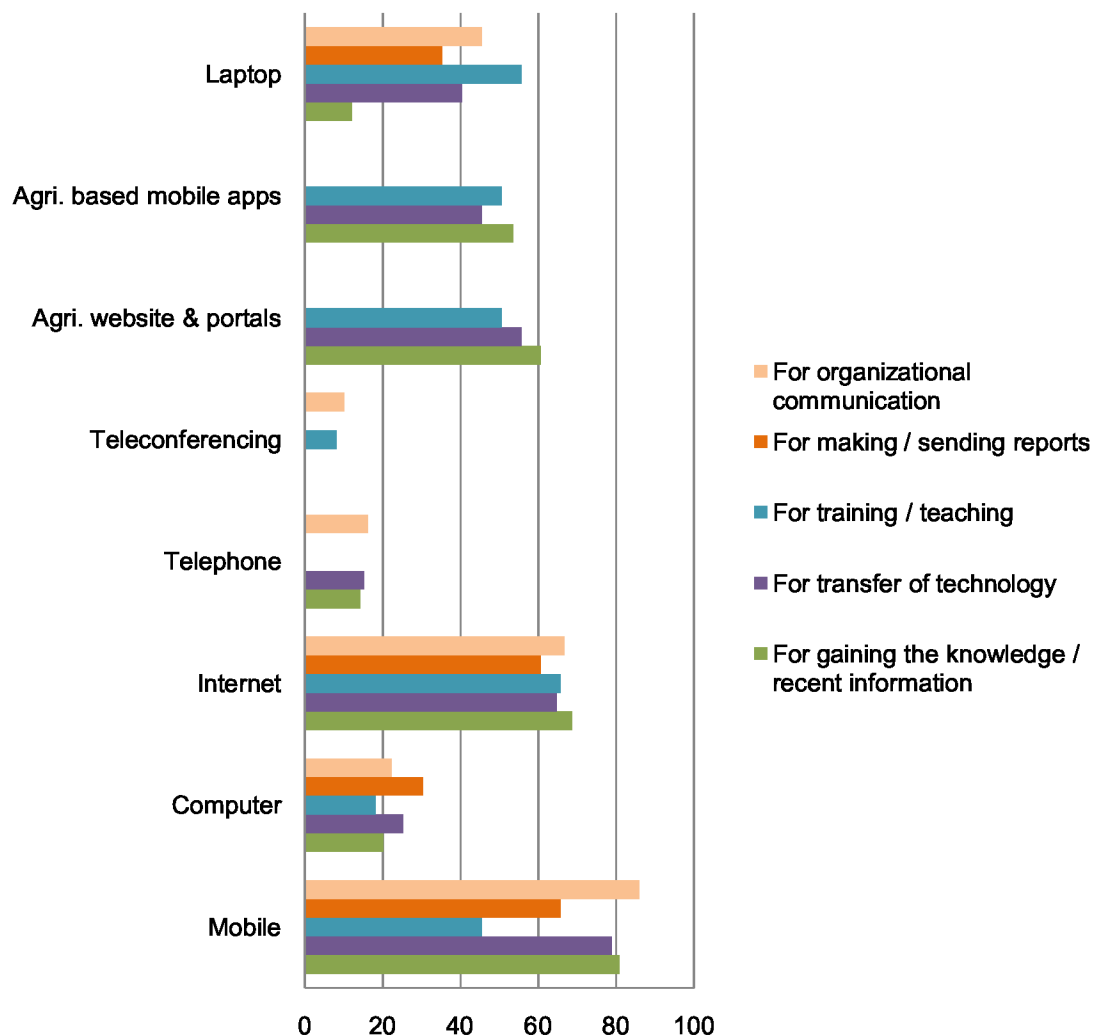
**Fig 4.13 Distribution of extension personnel according to their extent of utilization of individual ICT tools**



**Fig 4.1 Distribution of extension personnel according to their age**



**Fig 4.14 Distribution of extension personnel according to their purpose of utilization of ICT tools**



## **DISCUSSION**

This chapter describe the findings of the present study on the basis of objectives along with logical reasoning and presented in the following manner:-

1. To know the socio – economic profile of extension personnel using ICT tools.
2. To study the accessibility to ICT tools by the extension personnel.
3. To ascertain the utility pattern of ICT tools for transfer of technology (TOT) by the extension personnel.
4. To find out the association between independent and dependent variables.
5. To enumerate the constraints faced by the extension personnel and their suggestions in utilization of ICT tools.

### **Independent variable:**

#### **5.1 Profile of the extension personnel**

##### **1. Age**

The result of the present study showed that the higher percentage of extension personnel (40.40%) belonged to young age group (up to 35 years). The probable reason for higher percentage of the respondents to be in this age group might be that, young extension personnel can be considered as a positive factor for service delivery due to their curiosity in the beginning of their career. These results are in line with the findings of Vidyasagar (1998), Halasangi and Swamy (2012), Raksha *et al.* (2014) and Baig (2015).

## **2. Education**

Regarding level of education, maximum percentage of extension personnel (52.53%) was educated up to graduation in agri. science. The reason for this might be that, the need for extension workers to have the competence for the application and dissemination of technological innovations using ICTs for rural transformation and agricultural development. Without basic education it may be difficult for the extension personnel to make effective use of communication technologies for improved extension service delivery. The minimum essential educational level of entry to the occupation was B.Sc. Agriculture and adding any additional qualification may help them to attain further better positions. The finding finds support with the work of Ingale (1987), Sambireddy (1997) and Gangadharan (2015).

## **3. Knowledge level**

As regard to the knowledge level of extension personnel, it was observed that maximum percentage of extension personnel (47.47%) were having high knowledge level about ICT tools. The reasons quoted in specific knowledge items also holds good here. These results are in line with the finding of Agwu *et al.* (2008) and James and Lakshminarayan (2018).

## **4. Experience**

The result of the present study showed that the higher percentage of extension personnel (69.70%) were having low job experience. Since most of the extension personnel were under the category of up to 35 years of age group, low job experience is natural. The work of Helen (2008), Raksha *et al.* (2014), Raksha and Meera (2015) and Noor Agha *et al.* (2018) are in support of the present study.

## **5. Training received on ICT tools**

The result of the present study showed that higher percentage (65.66%) of extension personnel were training received on ICT tools. The probable reason might be that, higher percentage of extension personnel belong to young age group and get interested for receiving the training on ICT tools. This finding is supported by Reddy (1983).

## **6. Job commitment**

The result of the present study showed that the higher percentage of extension personnel (53.54%) were having medium job commitment. The probable reason for majority of respondents to be under medium job commitment might be that they might have not accepted the job goals and are not willing to put efforts. This finding is supported by Prasannakumar (1985), Mohan (2000), Rao (2000) Manjunath (2004) and Sarada (2004).

## **7. Achievement motivation**

The present study shows that the maximum percentage of extension personnel (51.52%) were having medium achievement motivation. The reasons for the present finding might be the low promotional opportunities which have put majority of extension personnel in medium category. This finding is supported by Mohan (2000), Manjunath (2004), Ramprasad (2004), Venkataro (2004) and Kiran (2007).

## **8. Innovativeness**

The present study shows that the higher percentage of extension personnel (52.53%) were having medium innovativeness. The reason can be interpreted that these extension personnel will be able to accept and adopt the latest ICTs for the transfer of agricultural technologies. The work of Senthilkumar (2000), Sarala (2008), Baig (2015) and Gangadharan (2015) are in support of the present study.

## **5.2 Accessibility to ICT tools by the extension personnel**

The present study shows that the higher percentage (63.64%) of extension personnel access to medium (3 to 5 ) ICT tools among the various ICT tools. Most of the respondents were accessible to mobile, internet, agri. website & portals, laptop, computer and agri. based mobile apps but they were less accessible to telephone and teleconferencing. This finding is in accordance with the work of Cynthia and Nwabugwu (2016).

### **Dependent variable:**

## **5.3 Utility pattern of ICT tools for transfer of technology by the extension personnel**

### **1. Extent of utilization of ICT tools**

The present study shows that the higher percentage of extension personnel (58.59%) had overall medium extent of utilization of ICT tools followed by (33.33%) had low and 08.08 per cent of extension personnel had high extent of utilization of ICT tools. This finding is supported by Ragul *et al.* (2016).

### **2. Purpose of utilization of ICT tools**

The present study shows that the majority (80.81%) of the extension personnel used mobile for the purpose of “gaining the knowledge/ recent information”, majority (78.79%) of the respondents were used mobile for “transfer of technology”, higher percentage (65.66%) were used internet for “training and teaching”, higher percentage (65.66%) were used mobile for “making/ sending reports” and majority (85.86%) of the respondents were used mobile for “organisational communication”. This finding finds support with the work of Manty (2011) and Ragul *et al.* (2016).

#### **5.4 Association between socio – economic profile of extension personnel and utilization pattern of ICT tools**

The association between various characteristics of extension personnel like age, education, knowledge level, training received on ICT tools, job commitment, achievement motivation, innovativeness and accessibility to ICT tools were found to be positive and significant association with utilization of ICT tools, whereas experience was found to be negative and non – significant association with utilization of ICT tools.

The age of extension personnel showed positive and significant association with utilization of ICT tools. This leads to the hypothesis  $H_0-1$  was rejected. The findings was supported with the work of Tanko *et al.* (2013), Yakubu *et al.* (2014) and Khondokar and Roy (2015).

The education of extension personnel had shown positive and significant association with utilization of ICT tools. Thus, the hypothesis  $H_0-2$  was rejected. The finding was in line with the work of Ometesho *et al.* (2012), Rudroju (2013), Yakubu *et al.* (2014) and Gupta (2015).

The knowledge level of extension personnel had shown positive and significant association with utilization of ICT tools. As such hypothesis  $H_0-3$  was rejected. The finding finds support by Amar *et al.* (2011) and Baig (2015).

The experience of extension personnel had shown negative and non – significant association with utilization of ICT tools. Thus, the hypothesis  $H_0-4$  was accepted. The finding finds support by Amar *et al.* (2011).

The training received on ICT tools by the extension personnel had shown positive and significant association with utilization of ICT tools. Thus, the hypothesis  $H_0-5$  was rejected. The finding finds support by Amar *et al.* (2011).

The job commitment of extension personnel had shown positive and significant association with utilization of ICT tools. Thus, the hypothesis H<sub>0</sub>-6 was rejected.

The achievement motivation of extension personnel had shown positive and significant association with utilization of ICT tools. Thus, the hypothesis H<sub>0</sub>-7 was rejected. The finding finds support by Gupta (2015).

The innovativeness of extension personnel had shown positive and significant association with utilization of ICT tools. Thus, the hypothesis H<sub>0</sub>-8 was rejected. The finding finds support by Rudroju (2013), Jha *et al.* (2014), Baig (2015) and Gupta (2015).

The accessibility to ICT tools by the extension personnel had shown positive and significant association with utilization of ICT tools. Thus, the hypothesis H<sub>0</sub>-9 was rejected. The finding finds support by Rudroju (2013) and Khondokar and Roy (2015).

## **5.5 Constraints faced by the extension personal and their suggestions in utilization of ICT tools**

### **5.5.1 Constraints faced by the extension personnel in utilization of ICT tools**

The constraints faced by the extension personnel in utilization of ICT tools are presented.

The general problems – lack of knowledge (50.51%, rank-I) was the major problem, followed by lack of proper training facility (34.34%, rank-II), network problem (29.29%, rank-III) and insufficient power supply (08.08 %, rank-IV), While in the case of physiological problems faced by extension personnel, eye fatigue (36.36%, rank-I) was the major problem followed by head ache (34.34%, rank-II), back ache (18.18%, rank-III), shoulder pain (15.15%, rank-IV) and wrist pain (07.07%, rank-V).

### **5.5.2 Suggestions expressed by the extension personnel in utilization of ICT tools**

The most important suggestions founded by extension personnel in utilization of ICT tools were that provide proper training facilities of extension workers about ICT tools (34.34%, rank-I) followed by proper coverage of network (29.29%, rank-II), information regarding resources/ inputs availability should also be provided (16.16%, rank-III) and provide sufficient power supply facilities in rural areas (08.08%, rank-IV). The finding finds support with the work of Kale *et al.* (2017).

## **SUMMARY, CONCLUSIONS AND SUGGESTIONS**

### **FOR FURTHER WORK**

In India more than 70% of population resides in rural areas (Census, 2011) in which 56% of the workforce (Census, 2011) is engaged in agriculture and allied activities alone. The farmers living in the 6,36,000 villages are feeding the 1.21 billion population (Census, 2011) of the country. Most of our development programmes are concerned with the rural areas, still the villages are struggling with issues of poverty, illiteracy, poor sanitation and urban migration. The declining natural resources and distancing of technology gap also complicate the situation. Besides, the ever burgeoning population also demands best out of crop production. Hence, it is imperative to keep our farmers profitable and remunerative through latest communication gadgets. In this context, new advanced Information and Communication Technology (ICT) tools such as internet and mobile phones have tremendous potential to facilitate technology transfer to farming community. Through ICT tools people in rural areas can connect with the local, regional and national economy and access markets, banking/financial services and employment opportunities.

The role of Agricultural Officers in the agricultural extension system is very important because, they are the personnel whose technical contribution is directly influencing the farm productivity. Agricultural Officer is the grassroot level technical officer who is supposed to possess technical, communication cum management skill to deliver the agricultural inputs to the farming community more effectively.

Extension workers at the grassroot level, who have direct links with farmers are well positioned to make use of ICTs to access modern knowledge or other types of information that could facilitate the accomplishment of their activities. In a modern agricultural extension system, they need to know how to use ICTs for facilitating innovations.

For keeping in view the present study on “Access and Utilization Pattern of ICT tools by Extension Personnel for Transfer of Technology in Rajnandgaon District of Chhattisgarh Plain” have been conducted with the following objectives:

1. To know the socio-economic profile of extension personnel using ICT tools.
2. To study the accessibility to ICT tools by the extension personnel.
3. To ascertain the utility pattern of ICT tools for transfer of technology (TOT) by the extension personnel.
4. To find out the association between independent and dependent variables.
5. To enumerate the constraints faced by the extension personnel and their suggestions in utilization of ICT tools.

The investigation was carried out in 4 blocks namely Rajnandgaon, Dongargaon, Khairagarh and Chowki of Rajnandgaon district which was selected on the basis of random sample and 75 % extension personnel were selected from each block through random sampling method. Thus, a total of 99 respondents were selected for the study. The data were obtained through pre-tested structured schedule with the help of interview. The collected data were quantified, classified, tabulated and presented on the basis of frequencies and percentage. In order to find out the association between independent and dependent variables, the correlation coefficient was worked out.

## **6.2 Conclusions**

The conclusions of the present study are presented here on the basis of objectives.

### **6.2.1 Profile of the extension personnel**

- Higher percentage of extension personnel (40.40 %) belonged to young age group (up to 35 years).
- Higher percentage of extension personnel (52.53 %) were graduate in agriculture science.
- Higher percentage of extension personnel (47.47 %) had high level of knowledge about ICT tools.
- Higher percentage of extension personnel (69.70 %) had low level of experience in their service.
- Higher percentage of extension personnel (65.66 %) received training on ICT tools. Out of which 50.51 per cent extension personnel received training for 6 – 10 days duration.
- Higher percentage of extension personnel (53.54 %) belonged to medium category of job commitment.
- Higher percentage of extension personnel (51.52 %) belonged to medium achievement motivation.
- Higher percentage of extension personnel (52.53 %) belonged to medium innovativeness.

### **6.2.2 Accessibility to ICT tools by the extension personnel**

It may be concluded that, higher percentage (63.64%) of extension personnel access medium (3 to 5 ICT tools) followed by 26.26% were low (up to 2 ICT tools) and 10.10% were access high (above 5 ICT tools). Hundred per cent of the respondents were accessible to mobile followed by internet (70.71%), agri. website & portals (65.66%), laptop (60.61%), computer and agri. based mobile apps were (55.56%), telephone (20.20%) and teleconferencing (17.17%).

### **6.2.3 Utility pattern of ICT tools for transfer of technology by the extension personnel**

#### **6.2.3.1 Extent of utilization of ICT tools**

It may be concluded that, higher percentage (58.59%) of extension personnel had medium extent of utilization of ICT tools followed by (33.33%) had low and 08.08% of extension personnel had high extent of utilization. The extent of utilization of ICT tools by the extension personnel in the order of priority were; mobile (68.69 %) was “Very frequently” followed by internet (45.45%), agri. website & portals and laptop were (20.20%), agri. based mobile apps (17.17%), computer (15.15%), telephone and teleconferencing were (0.00%).

Whereas, “Frequently” extent of utilization were computer, agri. website & portals and laptop (30.30%), mobile (28.28%), agri. based mobile apps (23.23%), internet (15.15%), telephone (09.09%) and teleconferencing (07.07%).

While, “Less frequently” extent of utilization were agri website & portals (15.15 %), agri. based mobile apps (15.15%), telephone (11.11%), computer (10.10%), internet (10.10%), teleconferencing (10.10%), laptop (10.10%) and mobile were (03.03%).

Further, the data reveals that, some of the tools “Not at all” were teleconferencing (82.83%), telephone (79.80%), computer and agri. based mobile apps (44.45%), laptop (39.40%), agri. website & portals (34.35%), internet (29.30%) and mobile were (0.00%).

#### **6.2.3.2 Purpose of utilization of ICT tools**

The purpose of utilization of ICT tools by the extension personnel in the order of priority were “gaining the knowledge/ recent information” the tools used were; mobile (80.81%), internet (68.69%), agri. website & portals (60.61%), agri. based mobile apps (53.54%), computer (20.20%), telephone (14.14%), laptop (12.12%) and teleconferencing were (0.00%).

Whereas, the tools used for the purpose of “transfer of technology” were; mobile (78.79%), internet (64.65%), agri. website & portals (55.56%), agri. based mobile apps (45.45%), laptop (40.40%), computer (25.25%), telephone (15.15%) and teleconferencing were (0.00%).

Further, the ICT tools used to the purpose of “training and teaching” were; internet (65.66%), laptop (55.56%), agri. website & portals and agri. based mobile apps were (50.51%), mobile (45.45%), computer (18.18%), teleconferencing (08.08%) and telephone were (0.00%).

The tools used for the purpose of “making/ sending reports” were; mobile (65.66%), internet (60.61 %), laptop (35.35%), computer (30.30%), telephone, teleconferencing, agri. website & portals and agri. based mobile apps were (0.00 %).

The tools used for the purpose of “organisational communication” were; mobile (85.86%), internet (66.67%), laptop (45.45%), computer (22.22%), telephone (16.16%), teleconferencing (10.10%), agri. website & portals and agri. based mobile apps were (0.00 %).

#### **6.2.4 Association between profile of extension personnel and utilization pattern of ICT tools**

Age, education, knowledge level, training received on ICT tools, job commitment, achievement motivation, innovativeness and accessibility to ICT tools were positively correlated and significantly associated with utilization of ICT tools whereas experience was negatively and non- significantly associated with utilization of ICT tools.

## **6.2.5 Constraints faced by the extension personnel and their suggestions in utilization of ICT tools**

### **6.2.5.1 Constraints faced by the extension personnel in utilization of ICT tools**

The constraints faced by the extension personnel in utilization of ICT tools are presented.

The general problems were - lack of knowledge (50.51%, ranked I) followed by lack of proper training facility (34.34%, ranked II), network problem (29.29%, ranked III) and insufficient power supply (08.08%, ranked IV).

Whereas, in the case of physiological problems faced by extension personnel, eye fatigue (36.36 %,rank-I) was the major problem followed by head ache (34.34 %, rank-II), back ache (18.18 %, rank-III), shoulder pain (15.15 %, rank-IV) and wrist pain (07.07 %, rank-V).

### **6.2.5.2 Suggestions expressed by the extension personnel in utilization of ICT tools**

The most important suggestions founded by extension personnel in utilization of ICT tools were that provide proper training facilities of extension workers about ICT tools (34.34%, rank-I) followed by proper coverage of network (29.29%, rank-II), information regarding resources/ inputs availability should also be provided (16.16%, rank-III) and provide sufficient power supply facilities in rural areas (08.08%, rank-IV).

## **6.3 Suggestions for further work**

1. The study was confined to Rajnandgaon district only, hence the results may not be applicable to a large area. For appropriate generalization, similar work should be undertaken in other blocks and districts.

2. This investigation was based on only 99 respondents hence the future studies may be conducted on a large sample size.
3. In this study, the profile of selected extension personnel and utilization pattern of ICT tools were limited. Therefore, more number of variables may be included.
4. More intensive statistical techniques should be used for improving the contribution of different variables which might be given more strength to the study.
5. The further study to be planned according to personal socio-economic attributes.

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साक्षात्कार अनुसूची

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|----------------------------------|----------------------------------|
| डॉ.एम.के.दुबे                    | स्वाति देवांगन                   |
| प्राध्यापक                       | एम.एस.सी. कृषि अंतिम वर्ष        |
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शोध अवधि— 2018—19

छ.ग. के मैदानी भाग के राजनांदगांव जिले में प्रौद्योगिकी के स्थानांतरण के लिये विस्तार कर्मियों द्वारा सूचना संचार प्रौद्योगिकी उपकरण तक पहुंच और उपयोग पैटर्न ।

भाग— "अ"

क. सामान्य जानकारी—

नाम —————

मोबाईल नं.— —————

पद— —————

कार्यालय/विभाग— —————

कार्य का स्थान— —————

जिला— —————

तहसील— —————

ख. विस्तार कर्मी का सामाजिक-आर्थिक रूपरेखा —

1. कृपया बताइये आपकी उम्र क्या है ? ————— ( वर्षों में)

2. आपने शिक्षा प्राप्त की है ? (स्नातक अन्य विषय में/स्नातक कृषि में /स्नातकोत्तर अन्य विषय में/स्नातकोत्तर कृषि में/पी.एच.डी. कृषि में)

3. सूचना संचार प्रौद्योगिकी उपकरण के बारे में विस्तार कर्मी के ज्ञान का स्तर—  
सही विकल्प का चयन कीजिए—

1. आई. सी. टी. का पूरा नाम है—

क. इन्फॉर्मेशन एण्ड कम्युनिकेशन टेक्नॉलाजी

ख. इन्फॉर्मेशन एण्ड कम्युनिकेशन टेक्निकस

ग. इन्डिजिनस कॉमन टेक्नॉलाजी

2. मोबाईल है—

क. एक इलेक्ट्रॉनिक दूरसंचार उपकरण, जिसे अक्सर सेलुलर फोन या सेल फोन के रूप में संदर्भित किया जाता है, यह रेडियो तरंग या उपग्रह प्रसारण के माध्यम से एक वायरलेस संचार नेटवर्क से जुड़ता है और ध्वनि संचार, एस.एम. एस. और एम.एम.एस. प्रदान करता है, जिससे वेब ब्राउजिंग और ई-मेल जैसी इंटरनेट सेवाएं भी प्रदान की जा सकती हैं।

ख. एक संचार तकनीक उपकरण है।

ग. एक दूरसंचार उपकरण, जो केवल ध्वनि संचार प्रदान करता है।

3. कम्प्यूटर है—

क. एक प्रोग्राम करने योग्य मशीन है, जो इनपुट को ग्रहण करके, संग्रहीत करके, आंकड़े/सूचना में हेरफेर करके एक उपयोगी प्रारूप में आउटपुट प्रदान करती है।

ख. कम्प्यूटर को न तो बिजली की जरूरत होती है, न ही प्रोसेसर की, और न ही रैम की।

ग. कम्प्यूटर एक ऐसा उपकरण है, जो सूचना को उद्देश्यपूर्ण तरीके में बदल देती है।

4. इंटरनेट है—

क. परस्पर सम्बद्ध कम्प्यूटर नेटवर्क की एक वैश्विक प्रणाली है, जो दुनिया भर में अरबों उपयोगकर्ताओं की सेवा करने के लिए मानक इंटरनेट प्रोटोकॉल सूट (टीसीपी/आईपी) का उपयोग करती है।

ख. यह एक नेटवर्क है, जिसमें निजी, सार्वजनिक, व्यावसायिक और सरकारी नेटवर्क होते हैं।

ग. इनमें से कोई नहीं।

5. टेलीफोन है—

- क. टेलीफोन या फोन एक दूरसंचार उपकरण है, जिसका उपयोग दूरी पर ध्वनि प्रसारित करने और प्राप्त करने के लिए किया जाता है।
- ख. एक इलेक्ट्रॉनिक उपकरण जो एक तरह से अन्य लोगों के साथ बात करने के लिए उपयोग किया जाता है।
- ग. ध्वनि और अन्य संचार के लिए उपयोग किया जाता है।

6. टेलीकांफ्रेंसिंग है—

- क. एक ऐसा इलेक्ट्रॉनिक साधन है, जो एक विषय पर चर्चा करने के लिए दो या दो से अधिक भिन्न – भिन्न स्थानों पर स्थित दो या दो से अधिक व्यक्तियों को एक साथ मिला सकता है।
- ख. यह केवल एक ही स्थान पर स्थित दो या दो से अधिक व्यक्तियों को एक साथ मिला सकता है।
- ग. इनमें से कोई नहीं।

7. वेब आधारित सर्च इंजिन—

- क. इसका अर्थ है, कि इंटरनेट पर केवल 'गूगल', 'याहू' या 'अल्टा विस्टा' में जानकारी खोजना।
- ख. वेब सर्च इंजिन एक उपकरण है, जो डब्ल्यू डब्ल्यू डब्ल्यू पर जानकारी की खोज के लिए डिजाइन किया गया है।
- ग. इनमें से कोई नहीं।

4. आपको कितने साल की नौकरी का अनुभव है ? ————— (वर्षों में)

5. क्या आपने सूचना संचार प्रौद्योगिकी उपकरण पर कोई प्रशिक्षण प्राप्त किया है ?  
————— (हां/नहीं)

यदि हां तो, कृपया जानकारी दीजिए—

| क. | प्रशिक्षण कार्यक्रम का नाम | संगठन | अवधि |
|----|----------------------------|-------|------|
| 1  |                            |       |      |
| 2  |                            |       |      |

6. नौकरी प्रतिबद्धता—

कृपया निम्नलिखित कथनों पर चिन्ह करके आप अपनी प्रतिक्रिया इंगित करें—

| क. | कथन                                                                                                                                                                      | दृढ़ता<br>पूर्वक<br>सहमत<br>(5) | सहमत<br>(4) | अनिर्णीत<br>(3) | असहमत<br>(2) | दृढ़ता<br>पूर्वक<br>असहमत<br>(1) |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|-----------------|--------------|----------------------------------|
| 1  | अगर किसी को कृषि समुदाय की सेवा करने की वास्तविक इच्छा है, तो यह विस्तार कर्मियों का सबसे अच्छा काम है                                                                   |                                 |             |                 |              |                                  |
| 2  | आवश्यक शिक्षा वाले हर सक्षम युवा व्यक्ति के लिये विस्तारकर्मियों का काम ग्रामीण भारत की सेवा और देश की प्रगति के लिये चुनौती पेश करता है                                 |                                 |             |                 |              |                                  |
| 3  | अगर मैं एक समान वेतन प्राप्त कर सकता हूँ तो वहां कई अन्य नौकरी हैं, जो मैं विस्तार कर्मियों की तुलना में करूंगा                                                          |                                 |             |                 |              |                                  |
| 4  | अन्य नौकरियां हैं जिनके लिये मेरा मानना है, कि मुझे प्रशिक्षित किया गया जो विस्तार कर्मियों की तुलना में अधिक कर्मियों की संतुष्टि प्रदान करेगा                          |                                 |             |                 |              |                                  |
| 5  | हालांकि एक विस्तार कर्मी होने के नाते, इसका काम बहुत कठिन और मुश्किल है, फिर भी ईमानदारी से महसूस किया गया है, कि विस्तार कर्मियों की नौकरी एक बहुत ही पुरस्कृत नौकरी है |                                 |             |                 |              |                                  |

|    |                                                                                                                                                                          |  |  |  |  |  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 6  | अगर मैं अपने साथ ईमानदार हूं तो मैं विस्तार कर्मी के रूप में अपने काम से असंतुष्ट हूं                                                                                    |  |  |  |  |  |
| 7  | मुझे लगता है कि कृषि समुदाय के साथ काम करना किसी अन्य नौकरी में होने से ज्यादा फायदेमंद है                                                                               |  |  |  |  |  |
| 8  | एक विस्तार कर्मी होने के कारण मुझे बहुत स्वतंत्रता मिलती है, और यदि मैं सरकारी कार्यालय में क्लर्क होता तो मुझे यह स्वतंत्रता नहीं रहती                                  |  |  |  |  |  |
| 9  | जब मैं वैकल्पिक नौकरियों को देखता हूं, जिसके लिये मुझे लगता है कि मुझे प्रशिक्षित किया गया है, तो मुझे खुशी होती है, कि मैं एक विस्तार कर्मी के रूप में कार्य कर रहा हूं |  |  |  |  |  |
| 10 | जब तक कि किसी व्यक्ति को कृषि समुदाय की सेवा करने की वास्तविक इच्छा न हो, उसे विस्तार कर्मी बनने की कोशिश नहीं करनी चाहिए ।                                              |  |  |  |  |  |

7. प्रेरण उपलब्धियां—

कृपया निम्नलिखित कथनों पर चिन्ह करके अपनी प्रतिक्रिया इंगित करें—

| क. | कथन                                                                                                          | सहमत<br>(2) | अनिर्णीत<br>(1) | असहमत<br>(0) |
|----|--------------------------------------------------------------------------------------------------------------|-------------|-----------------|--------------|
| 1  | काम सबसे पहले आना चाहिए भले ही कोई व्यक्ति लक्ष्यों को प्राप्त करने के लिए उचित आराम न कर सके                |             |                 |              |
| 2  | हमेशा के लिए संघर्ष करने की तुलना में, जो कुछ भी कम हैं, उसके साथ संतुष्ट होना बेहतर है                      |             |                 |              |
| 3  | कोई फर्क नहीं पड़ता कि मैंने क्या किया है, मैं हमेशा और अधिक करना चाहता हूँ                                  |             |                 |              |
| 4  | मैं वास्तव में कुछ मुश्किलों पर कड़ी मेहनत करना चाहता हूँ, भले ही यह प्रदान करता है, कि मैं इसे नहीं कर सकता |             |                 |              |
| 5  | जिस तरह से हालात अब एक दिन कठिन परिश्रम करने के लिए हतोत्साहित करती हैं                                      |             |                 |              |
| 6  | किसी को अपने परिवार की उपेक्षा करना पड़ता है, भले ही किसी को नौकरी में सफल होना है ।                         |             |                 |              |

## 8. नवीनता –

कृपया निम्नलिखित कथनों पर चिन्ह करके आप अपनी प्रतिक्रिया इंगित करें—

| क्र. | कथन                                                                                                                                                                                                 | ज्यादातर पसंद<br>(2) | कम से कम पसंद<br>(1) |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------|
| 1    | मैं नवीनतम प्रौद्योगिकी सूचना संचार प्रौद्योगिकी उपकरण की जानकारी के साथ अपने आप को अहातित रखने की कोशिश करता हूँ, लेकिन इसका मतलब यह नहीं है, कि मैं सभी नये सूचना संचार प्रौद्योगिकी उपकरण आजमाया |                      |                      |
| 2    | जब तक मैं एक नया सूचना संचार प्रौद्यो. उपकरण नहीं सुनता, तब तक मैं बैचैन महसूस करता हूँ                                                                                                             |                      |                      |
| 3    | कई नये सूचना संचार उपकरण अब आ रहे हैं, लेकिन कौन जानता है, कि वे पुराने से बेहतर हैं या नहीं ?                                                                                                      |                      |                      |
| 4    | समय-समय पर मैंने कई नये सू.सं.प्रौ.उपकरणों के बारे में सुना और पिछले कुछ वर्षों में उनमें से अधिकतर कोशिश की                                                                                        |                      |                      |
| 5    | मैं आमतौर पर सू सं प्रौद्यो उपकरण का प्रयोग करने से पहले यह देखता हूँ कि मेरे साथियों को इसका क्या परिणाम प्राप्त हुआ                                                                               |                      |                      |
| 6    | किसी भी तरह का सबसे पुराना सू.सं.प्रौ.उपकरण रेडियो सभी के बीच में सबसे अच्छा लगता है                                                                                                                |                      |                      |
| 7    | मैं नये सू.सं.प्रौ.उपकरण की कोशिश करने के बारे में सतर्क हूँ                                                                                                                                        |                      |                      |
| 8    | मुझे नये सू.सं.प्रौ.उपकरण की कोशिश करने में बहुत रुचि है                                                                                                                                            |                      |                      |
| 9    | अक्सर नये सू.सं.प्रौ.उ. महंगे हैं, हालांकि अगर वे सस्ते हो, तो मैं निश्चित रूप से उसका उपयोग करना चाहूंगा ।                                                                                         |                      |                      |

भाग—“ब”

आपके (विस्तार कर्मी) द्वारा सूचना संचार प्रौद्योगिकी उपकरण की सुगमता—

| क. | सूचना संचार प्रौद्योगिकी उपकरण का नाम | उपकरण की सुगमता |                  |
|----|---------------------------------------|-----------------|------------------|
|    |                                       | पहुंच (1)       | पहुंच से दूर (0) |
| 1  | मोबाईल                                |                 |                  |
| 2  | कम्प्यूटर                             |                 |                  |
| 3  | इंटरनेट                               |                 |                  |
| 4  | टेलीफोन                               |                 |                  |
| 5  | टेलीकांफरेन्सिंग                      |                 |                  |
| 6  | कृषि वेबसाइट और पोर्टल्स              |                 |                  |
| 7  | कृषि आधारित मोबाइल एप्पस              |                 |                  |
| 8  | लैपटॉप                                |                 |                  |
|    | यदि अन्य उपकरण हो तो, कृपया बताइये—   |                 |                  |

भाग—“स”

प्रौद्योगिकी स्थानान्तरण के लिये विस्तार कर्मियों द्वारा सूचना संचार प्रौद्योगिकी उपकरण का उपयोगिता पैटर्न —

1. उपयोग की सीमा —

| क. | सूचना संचार प्रौद्योगिकी उपकरण का नाम | उपयोग की सीमा   |            |        |                  |
|----|---------------------------------------|-----------------|------------|--------|------------------|
|    |                                       | बहुत ज्यादा (3) | ज्यादा (2) | कम (1) | बिल्कुल नहीं (0) |
| 1  | मोबाईल                                |                 |            |        |                  |
| 2  | कम्प्यूटर                             |                 |            |        |                  |
| 3  | इंटरनेट                               |                 |            |        |                  |
| 4  | टेलीफोन                               |                 |            |        |                  |
| 5  | टेलीकांफरेन्सिंग                      |                 |            |        |                  |
| 6  | कृषि वेबसाइट और पोर्टल्स              |                 |            |        |                  |
| 7  | कृषि आधारित मोबाइल एप्पस              |                 |            |        |                  |
| 8  | लैपटॉप                                |                 |            |        |                  |
|    | यदि अन्य उपकरण हो तो, कृपया बताइये—   |                 |            |        |                  |

2. उपयोग का उद्देश्य –

| क. | सूचना संचार प्रौद्योगिकी उपकरण का नाम | उपयोग का उद्देश्य                     |                                       |                                  |                                     |                                |
|----|---------------------------------------|---------------------------------------|---------------------------------------|----------------------------------|-------------------------------------|--------------------------------|
|    |                                       | ज्ञान / वर्तमान जानकारी के लिए<br>(5) | प्रौद्योगिकी स्थानांतरण के लिए<br>(4) | प्रशिक्षण / शिक्षण के लिए<br>(3) | रिपोर्ट बनाने / भेजने के लिए<br>(2) | संगठनात्मक संचार के लिए<br>(1) |
| 1  | मोबाइल                                |                                       |                                       |                                  |                                     |                                |
| 2  | कम्प्यूटर                             |                                       |                                       |                                  |                                     |                                |
| 3  | इंटरनेट                               |                                       |                                       |                                  |                                     |                                |
| 4  | टेलीफोन                               |                                       |                                       |                                  |                                     |                                |
| 5  | टेलीकांफरेन्सिंग                      |                                       |                                       |                                  |                                     |                                |
| 6  | कृषि वेबसाइट और पोर्टल्स              |                                       |                                       |                                  |                                     |                                |
| 7  | कृषि आधारित मोबाइल एप्पस              |                                       |                                       |                                  |                                     |                                |
| 8  | लैपटॉप                                |                                       |                                       |                                  |                                     |                                |
|    | यदि अन्य उप. हो तो, कृपया बताइये—     |                                       |                                       |                                  |                                     |                                |

## भाग—“द”

अ. विस्तार कर्मियों द्वारा सूचना संचार प्रौद्योगिकी उपकरण के उपयोगिता में आने वाली समस्याएँ—

निम्नलिखित समस्याओं में से जो समस्याएँ सूचना संचार प्रौद्योगिकी उपकरण के उपयोग में आपके सामने आई हैं, उनमें कृपया चिन्ह करके आप अपनी प्रतिक्रिया इंगित करें—

| क. | समस्याएँ                                 | हां (1) | नहीं (0) |
|----|------------------------------------------|---------|----------|
| क. | सामान्य समस्याएँ—                        |         |          |
| 1  | उचित प्रशिक्षण सुविधा की कमी             |         |          |
| 2  | अपर्याप्त बिजली की सुविधा                |         |          |
| 3  | नेटवर्क की समस्या                        |         |          |
| 4  | ज्ञान की कमी                             |         |          |
|    | यदि कोई अन्य समस्या हो तो, कृपया बताइये— |         |          |
| ख. | शारीरिक समस्याएँ —                       |         |          |
| 1  | आंख दर्द                                 |         |          |
| 2  | पीठ दर्द                                 |         |          |
| 3  | सिर दर्द                                 |         |          |
| 4  | हाथ दर्द                                 |         |          |
| 5  | कंधा दर्द                                |         |          |
|    | यदि कोई अन्य समस्या हो तो, कृपया बताइये— |         |          |

ब. प्रौद्योगिकी के स्थानांतरण के लिए सूचना संचार प्रौद्योगिकी उपकरण की सुगमता और उपयोग पैटर्न को प्रभावी बनाने के लिये, कृपया आप अपने सुझाव दीजिए —

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## CURRICULAM VITAE



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She has got the following degrees,

| <b>S. No.</b> | <b>Degrees Granted</b> | <b>Institution</b>                                                     | <b>University/ Board</b> | <b>Percentage</b> | <b>Year</b> |
|---------------|------------------------|------------------------------------------------------------------------|--------------------------|-------------------|-------------|
| 1             | M.Sc. (Ag.)            | JNKVV, Jabalpur (M.P.)                                                 | JNKVV, Jabalpur          | 73.10             | 2019        |
| 2             | B.Sc. (Ag.)            | Gayatri College of Horticulture, Dhamtari (C.G.)                       | IGKVV, Raipur            | 70.60             | 2017        |
| 3             | 12 <sup>th</sup>       | Govt. girls higher secondary school, Bemetara (C.G.)                   | CG Board, Raipur (C.G.)  | 82.00             | 2013        |
| 4             | 10 <sup>th</sup>       | Gyan deep vidya mandir higher secondary school, Birgaon, Raipur (C.G.) | CG Board, Raipur (C.G.)  | 82.50             | 2011        |

She has following scientific interests- For the partial fulfilment of master's degree programme she was allotted a research problem on **“Access and Utilization Pattern of ICT Tools by Extension Personnel for Transfer of Technology in Rajnandgaon District of Chhattisgarh Plain”** which was successfully conducted by her and being submitted in the form of thesis.