

# Periodic Research

## Use of ICT Tools in Agriculture: A Study in Tumkur District

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### Abstract

A study was undertaken to elicit the farmers usage about ICT tools in Karnataka. The study was conducted in Tumkur district of Karnataka State with 50 respondents. To study the usage and the impact of ICT in agriculture among the farmers of Tumkur district. Tumkur district is a rain fed area. Where the crops grow in this area are more dependent on rain and bore well. The result showed that 90 percent of the respondents use mobile phones. 42 percent respondents use mobile phones to see market price. Another 58 percent use mobile phones for other purpose only.

For weather related most of the farmers say by their own predictions they do farming. Interestingly through the study the result showed that 62 percent of the farmers take seeds, pesticides and some information regarding agricultural inputs from input dealers. Through the result of the study the use of ICT tools in agriculture is very less in Tumkur Distirct, Karnataka state. The socio-economic characteristics like Age, Education and Annual income have no relationship with farmers while using ICT tools in farming.

**Keywords:** ICT tools, Farmers, Mobile Phones, Agriculture.

#### Introduction

India is one of the largest countries in the world, where agriculture is the main profession. Two-thirds of the population is depending on agriculture directly or indirectly. It is not only a source of livelihood but also a way of life. It is the main source of food and fodder. Agriculture is the basic foundation of our Economy.

Indian farming is mostly based on traditional way of agriculture. But the scenario is changing rapidly with the advent of ICT tools and also efficient use of the same in Agriculture. Millennials ignore their high paying jobs, and taking agriculture as their profession. These people, who contributed to the systematic use of ICT tools.

Already usage of ICT is very vast in education and health sectors, in the agriculture also the ICT usage is extending for the benefit of farmers. Use of ICT tools making farmers to take informed decisions in their crop pattern, yield management and marketing. Only efficient use of ICT tools can prevent farmer's suicides out of distress in agriculture.

Information and communication technology agriculture also known as E-Agriculture focuses on the enhancement of agricultural and rural development through improved information and communication processes.

Literally speaking agriculture means the production of crops and livestock on a farm. Generally speaking, agriculture is cultivation of crops. Agriculture is the back bone of our Indian economy. In Economics, agriculture means cultivation of crops along with animal husbandry, poultry, dairy farming, fishing and even forestry.

More specifically, e-agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use information and communication technologies (ICTs) in the rural domain, with a primary focus on agriculture. In the digital era ICT includes devices, networks, mobiles, services and applications; these range from innovative internet-era technologies and sensors to other pre-existing aids such as telephones, televisions, radios, satellites.

Many ICT in agriculture or e-agriculture interventions have been developed and tested around the world to help agriculturists improve their livelihoods through increased agricultural productivity and income, or by reducing risks. Some useful resources of learning about e-agriculture in practice are the World Bank's E-Sourcebook ICT in agriculture (2012).

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## ICT in Agriculture

Information and communication technologies- an umbrella term includes Radio, Television, Cellular Phones, Satellite systems etc. Applied for processing, exchanging and managing data, information and knowledge. To communicate desired information to the target audience in a participative way.

ICTs as an instrument for progress and development has been widely acknowledged in this 'Global Information age', and it has been observed that people with all walks of life are being impacted by the IT sector directly or indirectly. Among other ICTs, mobile telephony has emerged as the technology of choice of the majority of the urban and even the rural masses (Ansari and Pandey, 2013). The possession of mobile phones particularly has become a necessity in the contemporary society irrespective of age, status, profession, income groups or place of residence. As such, mobile phones have been regarded as the widely accessed tool among the farmers for communication and also accessing agriculture-related information particularly for the marketing of produce (Chhachar et al., 2014).

In this context, mobile technologies can offer the means for development in developing countries (Rashid and Elder, 2009). ICTs, therefore, offer opportunities to reach more people through easy access to local or global information and knowledge. Hence, with the new emerging paradigm of agricultural development, old ways of delivering important services to citizens are being challenged; traditional societies are also being transformed into knowledge societies all over the world which makes people living in the villages think and do things differently (Meera et al., 2004). For instance, Jabir (2011) reported that ICT-based information delivery has helped the livestock farmers of Uttar Pradesh in India in making significantly better quality decisions on various livestock practices as compared to ICT non-users. Further, the application of ICT among farmers of Madhya Pradesh, Uttar Pradesh and Tamil Nadu of India reported that information acquisition and facilitating transactions in input and output markets by ICT-based initiatives have also helped farmers in reducing transaction cost (Adhiguru and Devi, 2012).

## Objectives of the Study

The present study has the following Objectives.

1. To study the ICT usage in agriculture among farmers of Tumkur district
2. To study the impact of ICT usage in agriculture on farmers of Tumkur district

## Need of ICT in Agriculture

Many farmers not educated and they are cut off from cities and information. Lack of extension facilities and lack of knowledge of modern technologies and market prices, inability to compete with modern farmers and there is a gap between traditional and modern technology. So seeing this Government of India had come under ICT Initiatives like AGMARKNET, Kisan Call Center, and M-Kisan etc.

The main focus of ICT in agriculture is meeting the farmers need for information. Some of the ICT needs are as follows- Market information, Information about Subsidies, Weather forecasting, General agricultural news, Information on Insurance, Warning and management of diseases and pests and Soil testing and soil sampling information

## ICT and Farmers

Information and Communication technology (ICT) is an extensional term for Information Technology (IT). The term ICT is also used to refer to the convergence of audiovisual and telephone networks with computer networks through a single cabling or link system. ICT is an umbrella term that includes any communication device, encompassing radio, television, cell phones, computer hardware, and satellite systems and so on.

ICT is a broad subject and the concepts are evolving. It covers any product that will store, retrieve, manipulate, and transmit information electronically in a digital form.

Information, communication and technology can revolutionize Indian farming sector and can benefit all farmers including small landholders. Agriculture is the most important sector with the majority of the rural population in developing countries depending on it. ICT helps in growing demand for new approaches.

ICT platform adds market knowledge and give farmer greater confidence in understanding the demand and enhance ability to the control production and manage supply chains. It also helps farmers to deal directly with large wholesalers or traders. To all the need for farmers ICT is very important in the Digital era.

To the digital era for the information, communication and technology agricultural and for farming purpose government of India, states and districts have implemented several ICT for farmers through Mobile Phones/Landlines, Usage of mobile phones for market or agricultural information, Raitha Samparka Kendra, AGMARKNET , Kisan Call Center/SMS Portal, Training from farmers training program, Agriculture Tour, Krishimaratavahini Website, and also traditional media like Newspaper or Agricultural Magazines, Radio, Television etc.here farmers also collect information from input dealers also. So in this study regarding input dealers also questions were asked.

## Review of Literature

Sushan Chowhan and Shapla Rani Ghosh (June, 2020) Role of ICT on Agriculture and its future scope in Bangladesh- the study says Bangladesh is the country where majority of the people doing agriculture for their livelihood. In this article the researcher explains that ICT usage is poor, due to lack of training, internet facility, and cost of internet data. In future agriculture farming there will be more usage of Technology for harvest of crops. So there will be need of ICT in agriculture. (Journal of Scientific Research and Reports – Article no- JSRR.57526, ISSN: 2320-0227.

Chukwunonso, F., Mohammed, A., & Obidi, N. (2012). The Adoption of Information and Communication Technology (ICT) in Agriculture in Adamawa State, Nigeria- The study says that there is no ICT adoption in the state. Due to lack of network connectivity, usage of mobile phones and other ICT tools. This made shocking that only one person uses computer in the study. The most examined in the study is the government should supply some of the ICT tools for free of cost and make them aware of that. So that usage of the ICT in agriculture will improve socio-economic development and also improvement of Adamawa state in Nigeria.

Adama, Oluwadamilola & Kemi (2016), -The role of Information Technology on Agricultural Production in Nigeria: The study says Nigeria is a vast country. But exposure to ICT tools is very less. There is a lack of network connectivity, usage of ICT is less, and high rate of illiteracy is main negative point of the farmers in the Nigeria. There is a inadequate finances, lack of technology awareness, no institutional framework these are all some major problems where the study shows the real picture of the Nigeria among famers in the usage of ICT for the production.

Mittal S, 2012- He focused the use of ICT in all states of India. The study was done in December 2005. The study says ICT in agriculture is not a new concept. But the use of modern tools of ICT like the internet, web portals and mobile phones are used in improving climatic changes. The research pointed out that the use of new tools of ICT like voice message, SMS, Video through local languages is useful to farmers. And the use of modern technology information is depending on the networks. So that the use of modern technology is very slow.

Rebekka Syiem, Saravanan Raj (2015), the researcher findings were done in state of Meghalaya of two district in which the ICT usage of mobile phones for social networking is more and also due to erratic power supply, low network connectivity, lack of awareness and benefits of ICTs were the reason to use less ICT. Another major issue the study find out is local language was insufficient for ICT usage. The study also recommends that the overcome erratic and fluctuating power supply can be resolved by using renewable energy such as solar panels. The researcher also find out that if there is

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awareness and training programmes regarding ICTs among farmers given there will be good development in usage of ICTs.

K. Lokeswari (2016), - A Study of the use of ICT among Rural Farmers-International Journal of Communication research paper the study was conducted in Pollachi of Coimbatore district, Tamil Nadu many farmers were using ICT services in agriculture. The majority of the farmers are all youngsters and they are all literates so that the usage of the ICT in the study is positive in aspect.

K P Raghuprasad, S C Devaraja and Y M Gopala, (2012), the research article was focused on ICT tools in farm communication on Bangalore rural, Chikkaballapur and Kolar Districts of Karnataka. In the study the result of usage of ICT for farm communication among farmers were literate. So that the respondents use of ICT tools were resulted in favourable attitude. Here in the research article the higher landholding is related to usage of ICT tools says the results.

Dr. Nandeesh H K (2016), - Impact of Information and Communication Technology on Agricultural Sector in Karnataka: A case Study of Hassan District, Karnataka. Indicates the impact of ICT in Hassan district, where the impact is there should be improvement in ICT tools. There is usage of internet, smart phones are available also the ICT usage and awareness in agriculture among farmers should increase. The researcher also made some suggestions to do future study in ICT. That is Raitha Samparka Kendra should be enhance the farmers knowledge and also Kisan Call Centers in Karnataka should be evaluated.

Kakade, onkar (2013). Credibility of Radio Programmes in the Dissemination of Agricultural Information: A Case Study of Air Dharwad, Karnataka. Journal of Humanities and Social Science- The study stated that radio is a medium of message, where below 30 years of farmers use radio as a majority for agriculture information. The research paper says farmers are interested in the discussion method. Where they are not interested in listening talks. Here in the study a large number of information and communication was done through radio is more useful to farmers.

## Significance of the Study

Already usage of ICT is very vast in education and health sectors, in the agriculture also the ICT usage is extending for the benefit of farmers. Use of ICT tools making farmers to take informed decisions in their crop pattern, yield management and marketing. Only efficient use of ICT tools can prevent farmer's suicides out of distress in agriculture. The agricultural production of the nation and farmer's cultivation method and knowledge depends on innovation technology as well as information technology. Thereby, ICT is very important in agricultural production and farmer's efficiency in farming activities. So present study focuses on how farmers utilize ICT in agriculture among farmers in Tumkur district, Karnataka State.

## Methodology

For the study survey method is used. Through using close ended questions were asked to farmers. For the present research, a multi-stage sampling technique has been used. First stage of sampling consists of selection of district, at the second stage Taluks (Blocks) and the third stage, villages were selected. At the final stage respondents will be chosen. For this study 50 respondents were selected.

The study area Tumkur District comprises of 10 taluks Tumkur rural, Sira, Madhugiri, Gubbi, Pavagada, Kunigal, Tiptur, Chiknayakanhalli, Turuvekere and Koratagere.

In that Chiknayakanhalli and Tumkur rural two taluks were selected for the study. In chiknayakanhalli byrapura village was selected. In Tumkur rural Guluru, Honnudiike, Doddahosuru, Kydala, oorkere villages were selected.

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### Limitations of the Study

The limitations of the present study are

1. Study is confined to one district of Karnataka.
2. Primary data was collected from respondents who are involved in the farm activities within the study area.
3. Study covers the public sector or government programmes and schemes. It does not takes in to consideration of private and NGO's ICT programmes.

### Data Analysis

**Table 1.1- Age group of the Respondents**

Age of the Respondents	No of respondents	Percentage
24- 35	14	28
36-50	20	40
51-65	12	24
66-75	4	8

Regarding the age group of respondents, it is observed that the highest 40 percent of respondents are in the age group of 36-50 years followed by 24-35years of age group with 28 percent of respondents. While 51-65 years age group has 24 percent. Respondents are in the age group of 66-75years has 4 percent

**Source-** Primary Data

**Table 1.2- Qualification of the Respondents**

Qualification of the Respondents	Frequency	Percent	Valid Percent	Cumulative Percent
post graduation	1	2.0	2.0	2.0
graduation	4	7.8	8.0	10.0
PUC	7	13.7	14.0	24.0
SSLC	15	29.4	30.0	54.0
less than matriculation	5	9.8	10.0	64.0
others	18	35.3	36.0	100.0
Total	50	98.0	100.0	
Missing System	1	2.0		

**Source-** Primary Data

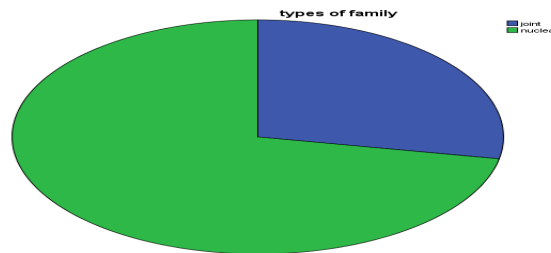


Regarding the qualification of respondents, it is observed that 35.3 percent belongs to other group. 29.4 percent had a SSLC qualification followed by 13.7 percent PUC, 7.8 percent graduation, only 2 percent post graduation and one is illiterate.

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	Frequency	Percent	Valid Percent	Cumulative Percent
joint	14	27.5	28.0	28.0
Valid nuclear	36	70.6	72.0	100.0
Total	50	98.0	100.0	

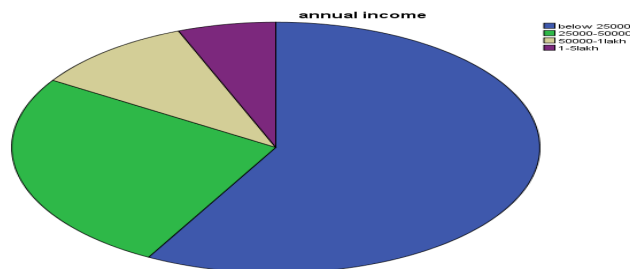
**Chart 1.3- Type of family of the respondents**



Connecting on whether the respondents are in a joint family or a nuclear family, it is observed that 70.6 percent of respondents stay in nuclear families while 27.5 percent of them are joint family and other 2percent is living individually.

**Table 1.4- Annual Income Level of the Respondents Source- Primary Data**

Annual Income of the respondents	Frequency	Percent	Valid Percent	Cumulative Percent
below 25000	29	56.9	58.0	58.0
25000-50000	13	25.5	26.0	84.0
50000-1lakh	5	9.8	10.0	94.0
1-5lakh	3	5.9	6.0	100.0
Total	50	98.0	100.0	

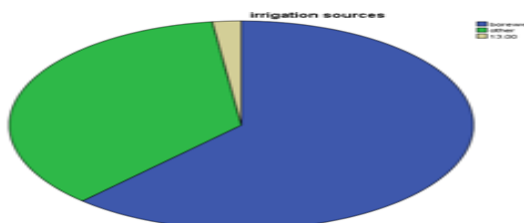


The data on annual income of the respondents is provided in table 1.3. The figures include sum total of income of all the earning members in the family. Accordingly, 56.9 percent of the respondents acknowledged that their total earning is less than Rs 25,000 followed by 25.5 percent of respondents in

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income bracket between Rs 25,000 to 50,000 annually. About 10 percent of respondents are in the family income category between more than 50,000 to one lakh and 6 percent of respondents are in the family income category between one lakh to five lakhs annually.

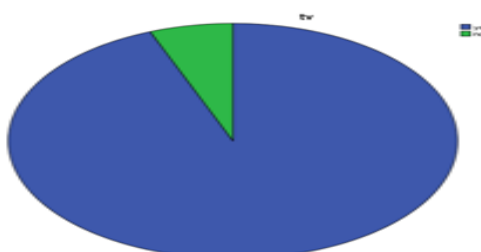
**Chart 1.5 Sources of Irrigation**



Regarding source of water for irrigation 60.8 percent of respondents are dependent on bore wells while 35.3 percent are dependent on rain. Another two percent of them said they use other sources of water.

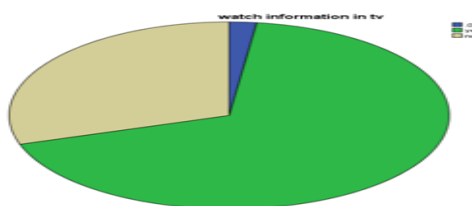
## Usage of ICT

**Chart 1.6 – TV at home**

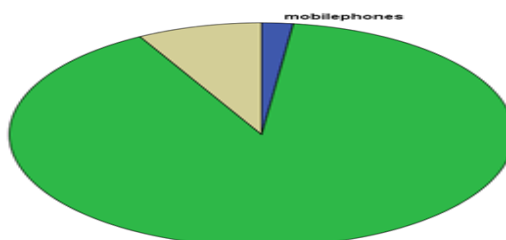


On the issue of whether they possess television at their home, 94 percent of the respondents said they have television set at the home. Furthermore, it emerged that 68 percent do not watch agricultural programmes that provide information pertaining to agriculture (table 1.7). This clearly indicates that 32 percent of respondents are not using television as a media for obtaining information related to agriculture. 6percent of the respondents do not have television set at the home.

**Chart 1.7 Watch agricultural information in TV**



**Chart 1.8 – MobilePhones**



For those respondents having mobile phone, 90 percent of the respondents use mobile phones. Another 10 percent of the respondents do not

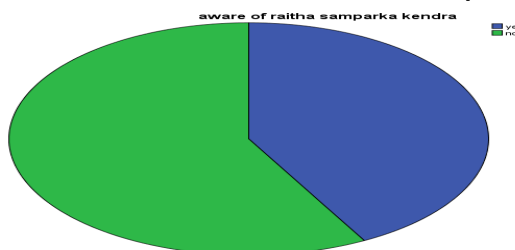
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use mobile phones. It is stated that (Chart 1.9) 42 percent respondents use mobile phones to see market price. Another 58 percent use mobile phones for other purpose only.

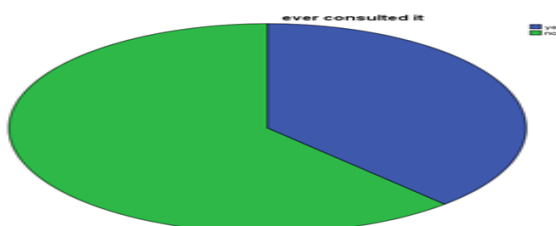
**Chart 1.9 – see market price in mobile phones**



**Chart 1.10 - Awareness of Raitha Samparka Kendra**



**Chart 1.11- Ever consulted RSK**



42 percent are aware of Raitha samparka Kendra,. When those asked ever consulted RSK 38 percent only respondents consulted and got the information. 58 percent does not aware of RSK and 62 percent does not ever consult RSK.

**Table 1.12- Awareness of Kissan call center**

Awareness of Kissan call center	NO of Respondents	Percentage
Yes	19	38
NO	30	60
missing	1	2.00
Total	50	100.00

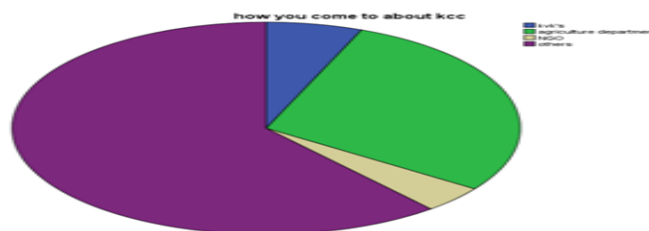
**Source-** Primary Data

Regarding the awareness of Kissan call center/SMS portal, it is observed that 38 percent of respondent are aware of this kind of Kissan cal center/SMS portal while 60 percent of the respondents are not at all aware of Kissan call center/SMS portal.



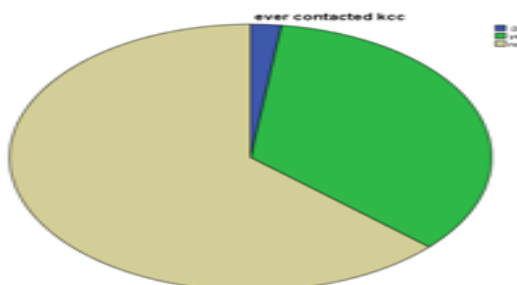
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**Table 1.13- How you come to Know about KCC**



When asked respondents about how you come to know about KCC 5.9 percent says through Krishi Vignana Kendra, while 28.6 percent respondents says through agriculture department and another 4 percent says through NGOs also they come to know about KCC, while 61.2 percent does not know about KCC. And another 2percent did not respond.

**Chart 1.14- Ever contacted KCC**

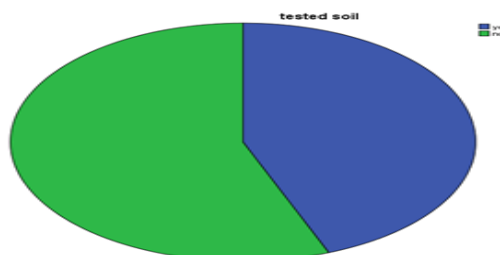


**Table 1.15 Farmers Training Program**

Farmers program	training	No of respondents	Percentage
yes		11	22.00
no		39	78.00
Total		50	100.00

Regarding the issue of any training being received by the respondents from the government, it is observed that Table 1.15 that 78 percent of respondents have not received any training by the government for the farmers while 22 percent of the respondents received the training sponsored by the government.

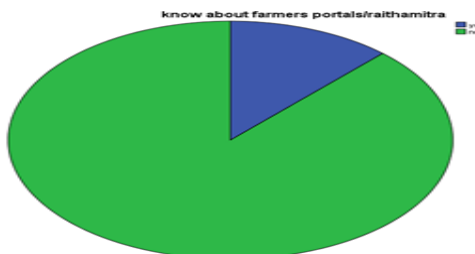
**Chart 1.16- Ever Tested Soil**



Furthermore when asked on whether they have ever tested the soil of their agricultural land it is observed that 56percent of them haven't carried out

any soil testing of their agricultural land while 44 percent of respondents have go the soul tested before cultivation.

**Chart 1.17- Know about farmers portals/Raithamitra**



Regarding the awareness farmers portal Raithamitra, it is observed that 88 percent of respondents are not aware of raithamitra while 12 percent of the respondents are aware of farmer’s portal Raithamitra.

**Table – 1.18 Awareness of Online Market by the respondents**

Aware of online market	No of Respondents	Percentage
yes	9	18.0
no	41	82.0
Total	50	100.0

To the query on the awareness of online market for agricultural outputs, it is observed that 82 percent of respondents are not aware about the concept of online marketing while 18 percent of the respondents are aware of online marketing.

**Table -1.19 Information from input dealers**

Information from input dealers	No of respondents	Percentage
yes	31	62.0
no	19	38.0
Total	50	100.0

When asked respondents regarding the information about agricultural seeds, pesticides from the dealers 62 percent says they take information from the input dealers while 38 percent will not take any information from the input dealers.

**Table -1.20 Weather Related Information**

Weather related information	No of Respondents	Percentage
Mobile phones	3	6.0
TV	8	16.0
radio	3	6.0
Progressive farmers	10	20.0
own	21	42.0

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Others	5	2.0
Total	50	100.0

Regarding weather related for agriculture farming 6percent respondents says they use mobile phones for information. While 16 percent depend upon TV for weather related, 6 percent listen to radio for weather related information, 20 percent from progressive farmers and another 42 percent say they only decide the weather by their own. While 2 percent did not respond.

**Table 1.21 – Not adopting ICT**

Not adopting ICT	No of respondents	Percentage
Lack of ICT skills	1	2.0
lack of awareness	9	18.0
too hard to use	1	2.0
not interest	6	12.0
lack of training	7	14.0
lack of network connectivity	6	12.0
others	20	40.0
Total	50	100.0

On the contrary when asked about the reasons to those respondents not interested in using ICT tools in agriculture, a few reasons were provided and the same is depicted in table 1.21. Accordingly, the primary reason in case of 18 percent of the respondents is the lack of awareness regarding the ICT technology. 2 percent is lack of ICT skills, and another 2 percent respondents say is too hard to use the ICT tools. While 12 percent are not interested and another 12 percent says there is lack of network connectivity, 14 percent says there is lack of training and while 40 percent says other reasons for not using ICT tools

**Chart 1.22- ICT necessary in Agriculture Field**

ICT necessary or not	No of respondents	Percentage
Yes	44	88.0
Do not know	5	10.0
NO	1	2.0
Total	50	100.0

Regarding ICT necessary in agriculture field 44 percent respondents say they have necessary, while 1 percent say ICT does have necessity and 5 percent respondents say they do not know about the necessary of ICT in agriculture field.

## Conclusion

For those respondents having mobile phone, 90 percent of the respondents use mobile phones. But 42 percent respondents only use mobile phones to see market price. Regarding online market also only 18 percent use mobile phones. Regarding weather related for agriculture farming 3 percent

respondents says they use mobile phones for information. Only 12 percent are aware of Raitamitra portal. Here we can conclude that usage of ICT in agriculture in Tumkur district, Karnataka is very less. Farmers need to use ICT for agriculture purpose.

In usage of ICT in agriculture among farmers there is no awareness regarding ICT technology also. Due to network connectivity also farmers are not using ICT for agriculture purpose. Lack of training about ICT is one the main reason farmers are not adopting ICT in farming. 44 percent of farmers say in the study that ICT is necessary in agriculture field. In the digital era, usage of ICT in agriculture to farmers is very necessary for the good yield. The study also proved that age and education did not impact the ICT usage in farming among farmers. And also income is not depending on ICT usage to farmers.

The study proved that encouragement for ICT has lot of scope in rural areas. The expansion of the usage of ICT can bring dramatic changes in the lifestyle of the farmers. Proper and organised usage of ICT will definitely change the Socio-Economic status of farmers. It can also work as a catalyst for rural income growth and development. Effective implementation can also largely curbs the urban migration from rural areas and improve the rural livelihood. So, it is necessary to enhance the connectivity in rural areas to widen the usage of ICT which has definitely trickle-down effect to reach the last person in the society.

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