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## Role of ICT in agriculture sector

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### Abstract

Agriculture is known as the primary sector of the Indian economy because of over a 55 per cent of the population adopts agriculture as main occupation and its share to GDP is almost 17 per cent. Indeed a large of Indian economy, agriculture is underdeveloped behind many facts and characterized by low connectivity and dissolution of market, uncertain and late information to the farmers, low land holdings, non adoption or less adoption of improved technology etc. It has become fundamental to explore different ways to keep our farmers updated about modern technologies and relevant information. The advancement and timely dissemination of better personalized technologies specific to different agro-climatic conditions, types of crops, size of holding land, type of soil, and related diseases/pests is the real issue to brazen it out ahead for the agricultural scientists/experts. The up-to-date availability of correct information and its proper use is essential for agriculture. ICT based drive can be taken for propagation of information, transfer of technology, procurement of inputs and selling of outputs in a way so that farmers can be benefitted. It helps to farmer with the timely availability of information and practical solution of the agriculture problems so he can adopt good agricultural practices, make better choices of inputs and to plan the cultivation properly

**Keywords:**-ICT in Agriculture, Information related Agriculture, Indian Farmers, Market.

### Introduction

Agriculture is known as the primary sector of the Indian economy because of over a 55 per cent of the population adopts agriculture as main occupation and its share to GDP is almost 17 per cent. Indeed a large of Indian economy, agriculture is underdeveloped behind many facts and characterized by low connectivity and dissolution of market, uncertain and late information to the farmers, low land holdings, non-adoption or less adoption of improved technology etc. It has become fundamental to explore different ways to keep our farmers updated about modern technologies and relevant information. Information technology revolution is upcoming and speedily extra noticeable now. With the introduction of information and communication technologies, the traditional agriculture has been reconstructed, eventually contributing to the significant development in agricultural productivity and sustainability. To provide right information at the right time and place to empowering farmers and it is essential for the improving the efficiency and viability of small and marginal holdings.

Huge data and information can be effectively generated, stored, analyzed, published and used to upgrade agriculture by inclusion of Information and Communication Technology. It may increment in production many folds by providing prompt, reliable and locality based information services to the farmers. Hence, ICT in agriculture has become a growing field of research and application related to e-agriculture.

Information and communication are always mandatory in agriculture. So people have start the cultivation of crop, rearing animals and catching the fish, they have share information to from one another. ICT can be designed broadly as “using electronic means for processing and disseminating information and thereby facilitating communication quickly and easily”.

### **Role of ICT in Agriculture**

Information and Communicational Technology (IT) has huge roles to perform for agricultural development its start from decision support system to the trading of crops.

### **Decision Support System**

ICT has a main role as decision support system to the farmers. Through ICT, farmers can be updated with the new information about agriculture, weather and climate, recent varieties of crops and other ways to increase production and quality control. The circulation of adequate, efficient and tailored technologies related to agro-climatic zone, size of land holding and soil type etc. to the farmers is scarce in Indian agriculture and it is the real challenge in front of policy makers in India.

Information and communication technologies can newscast the price of crop and authentic information at real time to the farmers so that they can utilize it and get advantage. The decision support system through ITC facilitates farmers for planning type of crops, practicing good agricultural practices for cultivating, harvesting, post harvesting and marketing their produce to get better results.

Various information is required in agriculture based on the different agro climatic regions, size of land holdings, types of crops cultivated, technology followed, market orientation, weather condition, etc. As described by many researchers, 'question and answer service' was perceived as the best facility by majority of the farmers to get personalized solutions to their specific agricultural problems.

### **Widen Market Access**

One of the major obstacles in Indian agriculture is complicated distribution channels for marketing of agricultural produce. Farmers do not get informed with the updated prices of commodities, proper place for selling their inputs and consumer trends also. ICT has the enormous potential to expand marketing horizon of farmers directly to the customers or other appropriate users for maximum benefit. Farmers may attach directly with many users and may get knowledge about current prices for their crops. They can connect to the market sitting at home. Further, it will shorten the middle profit also which will be beneficial for the farmers. This can improve a farmer's source of receipts; helps farmers for making good selection about appropriate future crops and commodities and marketing channels to sell their produce as well as to get inputs.

### **Support and empower farming community**

ICT technologies can help for support farming communities through wide networking and association with various institutes, NGO's and private sectors. Further, farmers may build up their own capacities through updated information and wide exposure to scientific, farming and trade community.

### **Material and Methods**

#### **Data collections**

The analysis will be done with the help of secondary data. The data is collected mainly websites, annual reports, research reports, Already conducted survey analysis.

#### **Objectives of Study**

- 1) To study ICT Initiatives for Agricultural in India
- 2) To study the major components used and framework of ICT in Agriculture.

**Type of Study:** It is an a descriptive type of study.

### **Result and Discussion**

#### **Objectives 1-To study ICT Initiatives for Agricultural in India**

Almost 45 per cent ICT projects of the whole world have been implemented in India and also maximum number of information kiosks has been employed in rural India. Still, it was found that majority of the ICT projects in agriculture were put into action in socio- economically advanced states of South and North India, while deprived states are not benefitted by ICT initiatives. Some of the e-Agriculture initiatives in India are given below.

#### **1) Agmarknet**

Agricultural Marketing Information Network (AGMARKNET) was introduced in March, 2000 by Ministry of Agriculture, Government of India with the objective of empowering decision-making ability of the farmers regarding selling of their produce. This portal was developed to pace up the agricultural marketing system through spread information about influx of agricultural commodities in the market and their prices to producers, consumers, traders, and policy makers defiantly and speedily.

#### **2) iKisan**

iKisan is a web portal for transfer information to the farmers about wide-ranging issues related to agriculture such as crop cultivation, weather forecast, agricultural inputs availability and quality, agriculture related financing institutions, soil quality and market updates.

#### **3) Agrisnet**

It is a broad web portal to broadcast proper information to farmers, which was initiated and funded by the Ministry of Agriculture, Government of India. AGRISNET serves farming community by published information and providing services through use of Information & Communication Technology (ICT). It has following goals-

- 1) Providing information to the farmers on quality of the inputs and its availability.
- 2) Disseminating reports of various government schemes and recommending fertilizers after soil testing
- 3) Providing information on new technologies for increasing productivity in agriculture.

#### **4) Digital green**

Digital Green is a global organization, which works with the participatory approach by engaging rural community to boost their livelihood using digital platform. Interactive and self-explanatory videos are prepared for farmers by progressive farmers with the help of authority. These videos are shown to the single farmers or in groups. The videos are prepared focus the requirements and progress of the rural masses.

#### **5) eSagu**

The system eSagu was developed in 2004. eSagu provides personalized solution to the farmers' problems and recommendation them from sowing to harvesting. Farmers post their farm condition in the form of digital photographs and videos, which were analyzed by the agricultural scientists and authority. After that, they advise the right things to do to the farmers even small and marginal farmers are also getting

advantage by this.

The expert opinion is sent to the concerned farmer within short time. The questions of uneducated farmers are dealt with the help of educated coordinators at village level. The farm situation or queries is communicated to the agricultural experts and they transmit correct information to the farmers.

#### 6) Warana

The Warana “Wired Village” project was initiated in 1998 by the Prime Minister’s Office Information Technology (IT) Task Force with the objective of giving agricultural information and services to farmers for increasing productivity. The information is spread to the farmers in regional language about prices of agricultural outputs, employment schemes from the government of Maharashtra and educational opportunities. The information is spread through information kiosks with the help of operators, who are the main linkage between the farmers and the agricultural experts.

#### 7) IKSL

Iffco Kisan Sanchar Ltd (IFFCO Kisan) was introduced in 2012. It sent proper information and custom-made solutions to the concerned farmers through voice messages on mobile phones. The farmers can also interact directly to the agricultural experts on explicit themes via ‘phone-in’ programmes.

#### 8) Digital Mandi

Digital Mandi is an electronic trading platform for help to farmers and traders to sell and procure agricultural produce beyond the geographical and temporal limitations smoothly. Various financial institutions also participate in online trading of agricultural output to eliminate cash crisis.

#### 9) eArik

The eArik project was launched in 2007 and its objective is to disseminate climate smart agricultural practices and to complete food security. It is a combined platform to boost the accessibility of agricultural information and technology in north-eastern India. It distributes agricultural specialist advice on crop cultivation, crop management and marketing. Farmers can also collect information directly from the portal but field workers help farmers to collect ICT -based information or to consult with other agricultural experts.

#### 10) Akashganaga

This ICT project makes possible the milk collection, fat testing, and payment up-to-date and user friendly manner. It builds up the income generation of dairy farmers through incorporation of improved technology.

#### 11) aAQUA (Almost All Questions Answered)

aAQUA is a multilingual online system that helps farmers by advising them, work out their problems and answering their queries related to agriculture. Farmers are to register on aAQUA platform online or telephone calls. After that, they can send their queries on the portal, for which they receive answers shortly.

#### 12) Kisan Call Centers (KCCs)

KCCs were launched on January 21, 2004 by the Department of Agricultural and Co-operation with the main aim of providing extension services to the farming community in the regional

languages. The problems of farmers are tackled by agricultural graduates on help line, with this 1800-180-1551 free number in their local language. The agricultural experts also visit the farm in person to get an idea about critical agricultural problems to resolve them.

#### 13) Village Knowledge Centers (VKCs)

VKCs centers of MS Swaminathan research foundation, introduced in 1998 in Pondichery as a gateway of scientific information related to the prices of agricultural inputs and outputs, crop rotation, use of fertilizers and pesticides. Information is disseminated to the people through public address system.

#### 14) AgroNxt

AgroNxt is a multitasking platform to the farmers where farmers can get information about price of crops and inputs, agriculture advice, weather and climatic condition etc. AgroNxt thrives to contribute to agriculture industry by sending farmer’s usable, reliable and timely information that boosts farm profitability. It assists in promoting the agricultural productivity and sustainability.

#### 15) Fisher Friend Mobile Advisory KCC

The Fisher Friend Programme (FFP) of M S Swaminathan Research Foundation was introduced in 2009 to protect fisher folk from occupational hazards and to empower their standard of living. The current information on wave height, wind speed and direction, potential fishing zones, relevant news, government schemes and market price is provided to fishermen in regional language.

The FFP covers marginalized coastal society in Tamil Nadu, Puducherry, Andhra Pradesh, Kerala, and Odisha, and is operational in English, Tamil, Telugu, Malayalam, Odia languages.

#### 16) Reuters Market Light (RML)

Reuters Market Light (RML) was launched in October, 2007 to deliver customized information to the registered farmers via mobile-SMS. It spreads information in eight local languages in 13 states.

#### 17) SMS Portal/mKisan Portal

This portal is constructed to focus on serving farmers in three ways-

- 1) To disseminate information about diversified agricultural activities,
- 2) To provide seasonal advisories
- 3) To provide various services directly to farmers through SMSs in their regional languages.

The SMS Portal empowers with a platform for amalgamation of service delivery under different zones viz. Agriculture, Horticulture, Animal Husbandry and Fisheries.

#### 18) Mahindara Kisan Mitra

This portal presents information to the farmers on price of commodities, weather forecast, crop advisories, loans, insurance, cold storage and warehouses along with success stories of progressive farmers.

#### 19) e-NAM or National Agriculture Market

e-NAM or National Agriculture Market is an online trading platform for agricultural commodities. It was launched on 14

April 2016 by Ministry of Agriculture, India. The market helps farmers, traders and buyers with online trading in commodities. The e-NAM market is helping in better price discovery and provides facilities for easy marketing of their produce.

### Objectives 2-To study the major components used and framework of ICT in Agriculture.

Major components which are used in our country for given ICT services to the farmers are web portals, mobile applications on android phone, SMS and voice messages on simple phones, information kiosks, videos and video conferencing with the experts. Agriculture experts are the key component in the whole process of spread of information to the farmers.



Fig 1: Major components used in ICT

The ICT components may circulate relevant, real, customized information to the farmers at proper time. Hence, ICTs provide a forum to reach masses smoothly and to make global and local information easily available to the stakeholders. Through ICT Information dissemination in agriculture is cost effective, time saving and speedy. The majority of the urban and rural people Mobile telephony has emerged as the foremost choice. Mobile phones were found as the most largely accessed tool among the farmers for communication and for accessing agriculture-related information particularly for the marketing of produce. Researchers also expressed that mobile phones were the most used ICT tool and highly accessible by the farmers. It was found in a comparative study that the livestock farmers of Uttar Pradesh, who were using ICT-based information made significantly superior judgment on various livestock practices as compared to ICT non-users. Further, few studies described that the ICT based initiatives helped farmers of Madhya Pradesh, Uttar Pradesh and Tamil Nadu of India, in reducing transaction cost while acquiring information and doing transactions in input and output markets.

### Framework of ICT in agriculture

On analysis of the above mentioned ICT initiatives, a common framework was found to spread agriculture related information. Farmers are facilitated by field workers who coordinate connect between agriculture experts and farmers. However, farmers can straightly access to agricultural information system. Agriculture experts are usually contacted

only when required genuinely and coordinators are able to answer the problems. Use of ICT in agriculture is mainly to spread agriculture related information to the farmers and to trade their produce in India. Information is broadcasting both online or offline. Internet is a extensive media for information flow.

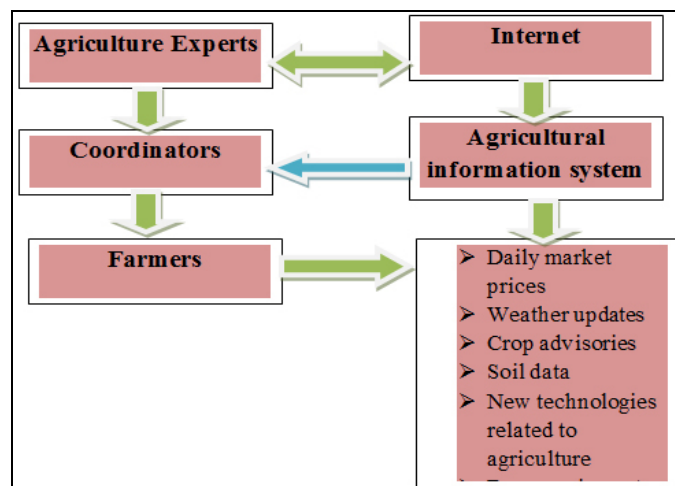


Fig 2: Framework of ICT in agriculture

The ICT initiatives in India are based chiefly to spread information. In the recent framework of ICTs, field coordinators as a channel between farmers and information system are much essential due to many reasons. Sometimes, farmers are not able to browse information from the system or to comprehend the system. Field coordinators may send real farm situation to the experts or information system for their opinion. This framework may be upgraded by including more advanced and high-tech approach in agriculture zone. Hence, another framework is proposed in the present paper.

### Conclusion

Agriculture is one of the most essential sectors in our country. It is well known fact that ICT can recast the agriculture in many ways. ICT projects are yet to make any development in agricultural information spread and other areas. ICT for agricultural projects essential to be compared and calculate precisely. It is essential of hour to obtain apposite information through ICTs and to expand advanced ICTs in agriculture.

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