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# Information & Communication Technology (ICT) in Indian Agricultural Sector with special reference to Kisan Call Centre (KCC)

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**ABSTRACT:** Information and Communication Technology (ICT) change the scenario of Indian lifestyle. It creates the revolution in telecommunication field which impact on various fields and pay way for next generalized growth. Still this powerful tool not implemented and exercised properly in agriculture sector. This paper focus on the various ICT tools and methodology available for in agriculture sector in general and especially focus on Kisan Call Centre's initiated, operational mechanism, and assessment among various states of India.

**KEYWORDS:** ICT, Agriculture, KCC

## I. INTRODUCTION

Agriculture plays a vital role in Indian Economy. More than 72.19% (CIA World Fact book, 2014) of rural population engaged with agriculture and its related activities. Agricultural sector faces the challenges of enhancing the production. The growing population gives enough opportunities for improving the method of production. Even though mass population engaged in this occupation but the yield of crops are very low when we compared with other developed countries. There are many factors involved in this such as environmental causes, illiteracy of farmers, traditional method of farming, lacking in technology adoption, neglecting of young generation to involve in this process etc. This study mainly focuses on the benefit of information technology in the field of agriculture. ICT includes any communication device such as Radio, Television, Mobile Phone, computer applications, satellites, internet and it's applications etc.

### Objectives

1. To know about the various methods of using information and communication technology in agricultural sector.
2. To analyze the factors affecting ICT implementation in agriculture sector.
3. To study the operating mechanism and measure the performance of Kisan Call Centre.

## II. REVIEW OF LITERATURE

As per **Weon-Sik Hahn**" Introduction of information technology into agricultural technology development in order to improve efficiency of agriculture R&D. Construct database based on the research results of the research institutes for efficient agricultural technology dissemination. Satisfy client's needs for agricultural technology through convenient consultation system via the Internet. Improve farmer's ability to use IT through various education programs.

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According to Manoharan (2015), “Due to globalization and liberalized system, this competition is likely to increase further and new initiatives in agriculture development shall have to meet the emerging challenges”.

Himadri Subrah Saha (2012), “Call centers are an integral part of many businesses, and their economic role is significant and growing. This call center can take a major part in our agriculture and thus it can enhance the growth of our economy”. They focused on the steps involved in assessing the technical design, staffing requirements of an agricultural call centre required to serve this type of agricultural call centre for incoming calls.

### III. METHODOLOGY

This paper analyzes the various ICT tools and its applications in agricultural field, especially focus on how the Kisan Call Centre fulfills the needs of farmer by providing appropriate information required by them. In India Kisan Call centre play significant role i-e information about crop production, crop protection, prices of products, market demand etc. This study includes only secondary data, collected from the Kisan call centre, various journals and information available in the website.

#### Various ICT Tools & Methods in Agriculture

*Information & Communication:* Mobile phone, internet, email, call centres (E-g: Kisan call centre) helps to know about the market price, information about the crop diseases, rainfall, weather condition etc.

*Expert Advice:* Using online facilities the expert can give their advice and suggestions to the farmers to harvest the global demand products

*Demand Based Agriculture Services:* Product Demand, online awareness program conducted by government, subsidies, online credit facility, online trading etc.

*Automation of Agriculture Functions:*

(i) *Wireless Technologies:* Wireless technologies have various applications in agricultural sector. Wireless communications used to eliminates the need for the installation of coaxial cables.

(ii) *Global Positioning System (GPS):* Global Positioning System provides benefits in geo-fencing, map-making and surveying. GPS receivers dropped in price over the years, making it more popular for common use. Using GPS we can produce simple yet highly accurate digitized map.

(iii) *Geographic information system (GIS):* GIS used in agriculture, especially in precision farming. Land is mapped digitally and pertinent geodetic data with other statistical data for easier analysis the texture of soil. GIS is used in decision making such as what to plant, when to plant, how to plant and where to plant using historical data and sampling.

(iv) *Computer-controlled devices (automated systems):* Automatic milking systems are computer controlled stand alone systems that milk the dairy cattle without human assistance. The complete automation of the milking process is controlled by an agricultural robot and specialized computers.

(v) *Smartphone mobile apps in Agriculture:* Reach of smart phone even in rural areas extended the ICT services such as simple voice or text messages. Several smart phone apps are available for agriculture, horticulture, animal husbandry and farm machinery.

(vi) *Radio Frequency Identification (RFID):* It's a livestock-tracking program, to track the cattle. Each cattle is tagged with the use of RFID technology for easier identification, providing access to relevant data such as bearer's location, name of breeder, origin of livestock, sex, and dates of movement.

#### Kisan Call Centre

India has a tremendous telecommunication network. As per the information provided by ‘The Economic Times’ (June 25, 2014), 300.63 million rural, using the mobile phones. The Rural teledensity (number of telephones per 100 people) was 43.96 as per the record of, the Telecom Regulatory Authority of India (TRAI). Based on this telecom revolution the Indian government and The Department of Agriculture & Cooperation (DAC), Ministry of Agriculture, launched Kisan Call Centers on January 21, 2004. First it was implemented in Gujarat state. The main objective of this scheme is to educate the agriculture knowledge at free of cost to all the farmers. The Kisan call centre scheme is available

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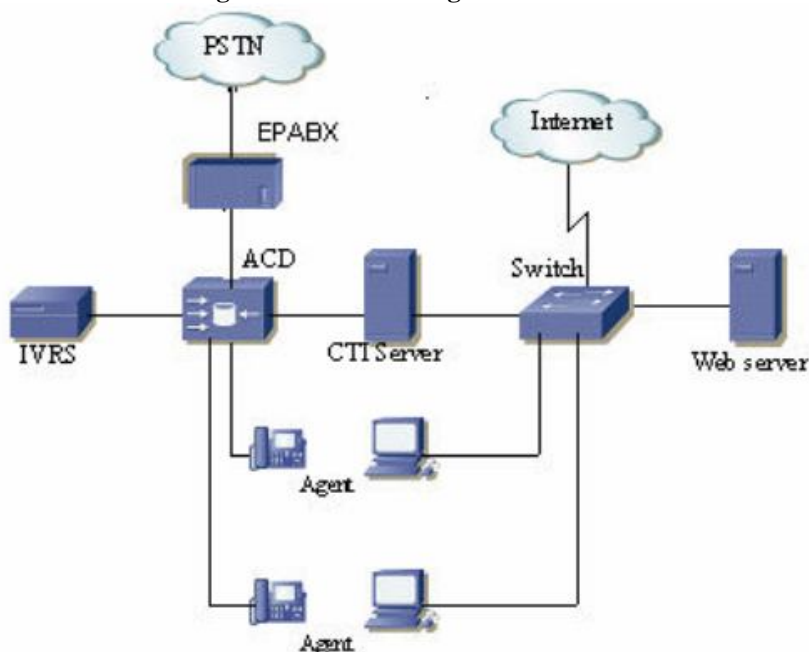
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throughout the country; farmer can use the toll free telephone number (1551). Initially the call centre were location only in Mumbai, Kanpur, Kochi, Bangalore, Chennai, Hyderabad, Chandigarh, Jaipur, Indore, Kolkata, Delhi and Ahmadabad.

### Schematic Diagram of KCC

Fig. 1 – Schematic Diagram of KCC



Source: TCIL Proposal, 2007

PSTN – Public Switched Telephone Network

EPABX: Electronic Private Automatic Branch Exchange referred as a switching system that makes available both internal and external stitching functions of any organization through telephone

IVRS: Interactive Voice Response is a technology that allows a computer to interact with humans through the use of voice and DTMF (Dual-tone multi-frequency signaling is an in-band telecommunication signaling system using the voice-frequency band over telephone lines between telephone equipment and other communications devices and switching centers tones) input via keypad

ACD: Automatic Call Distributor, facilitate to manage incoming calls and handles them based on the number called and an associated database of handling instructions.

CTI Server: Computer telephony integration means any technology that allows interactions of telephone and a computer to be integrated or coordinated.

Web Server: It is an information technology that processes requests via Hypertext Transfer Protocol (HTTP), used to distribute information on the World Wide Web(*www*).

### Operational Mechanism of KCC

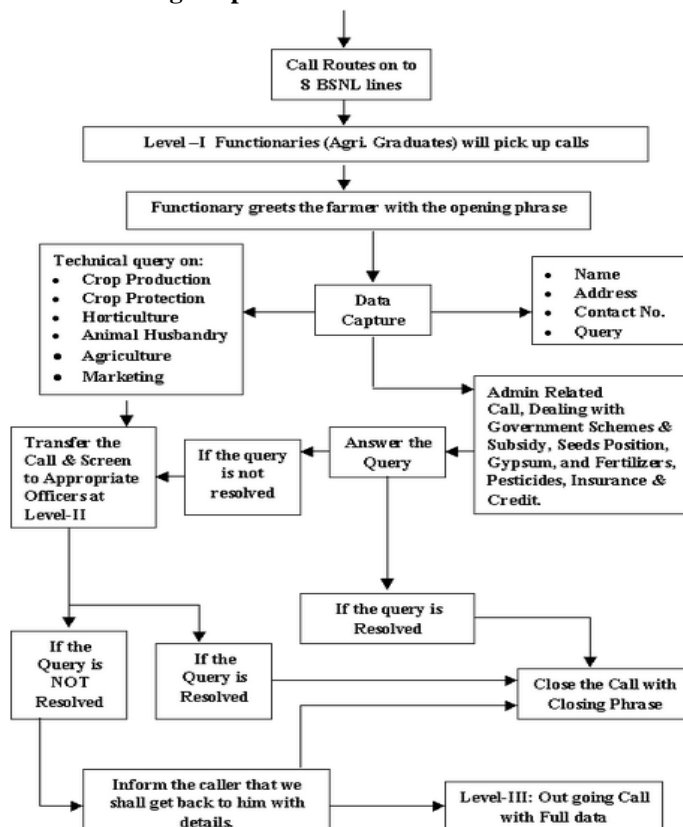
The Kisan Call Center is based on the combination of two separate technologies namely, the Information & Communication Technology (ICT) and the Agricultural Technology. Its proposed to make use of existing specialized infrastructure of Call Centers and make this communication available to the Subject Matter Specialists of Agriculture, Horticulture, Animal Husbandry, Marketing and other related areas. There are three levels in Kisan Call Centre.

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**Fig.2 Operational Mechanism of KCC**



Source: Kisan Call Centre, portal

In Level I – The incoming call is attended by the agricultural graduates who have rural background and knowing local language, can provide the information required by the farmer such as crop related information, market situation etc.

In Level II – If the queries are not resolved by the first level graduates then it will transfer to the level II which consist of field experts namely Subject Matter Specialist (SMS) those who are located at their respective place such as Research Stations, Agricultural colleges, Krishi Vigyan Kendras etc.

Level III- It consists of special cell located at the Nodal office. Queries which has not been solved in level II will be consulting with the field experts available in and around the state then appropriate solution will be informed to the farmers by mobile/telephone or via post/e-post shortly.

Majority of the queries are solved in the level I because most of the farmers like to know about the commodity price in the market. As per the report of Department of Agriculture and Cooperation (DAC) so far 41860688 SMS were send to the farmers related to commodity price. Farmers eager to know about the basic information such crop production, rainfall detail, prices etc. Very few only move to the level II and level III for the queries like fertilizer testing, machinery details etc.

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**Table 1 : Number of Phone Calls received by KCC from 2004-2014 (March)**

Sl.No.	States	2004-2014 (March)	2004-2012	2013-2014 (March)	% of Calls increased in 2013-2014
1	Andaman & Nicobar	9348	9271	77	0.82
2	Andhra Pradesh	509652	276805	232847	45.69
3	Arunachal Pradesh	4042	3825	217	5.37
4	Assam	125137	87471	37666	30.10
5	Bihar	254384	157158	97226	38.22
6	Chhattisgarh	168932	129899	39033	23.11
7	Dadra & Nagar Haveli	593	567	26	4.38
8	Delhi	219577	195345	24232	11.04
9	Goa, Daman & Diu	3840	3746	94	2.45
10	Gujarat	821832	586236	235596	28.67
11	Haryana	590459	381799	208660	35.34
12	Himachal Pradesh	260599	205510	55089	21.14
13	Jammu & Kashmir	382094	247813	134281	35.14
14	Jharkhand	71049	46812	24237	34.11
15	Karnataka	804467	670216	134251	16.69
16	Kerala	244920	230020	14900	6.08
17	Lakshadweep	1212	1193	19	1.57
18	Madhya Pradesh	1353410	1037636	315774	23.33
19	Maharashtra	1351699	683811	667888	49.41
20	Manipur	25865	24588	1277	4.94
21	Meghalaya	13190	12653	537	4.07
22	Mizoram	12158	12116	42	0.35
23	Nagaland	2160	2001	159	7.36
24	Orissa	348325	171331	176994	50.81
25	Punjab	810698	566041	244657	30.18
26	Rajasthan	1339232	911502	427730	31.94
27	Sikkim	5335	3578	1757	32.93
28	Tamil Nadu & Puducherry	666322	439814	226508	33.99
29	Tripura	25150	20616	4534	18.03
30	Uttar Pradesh	3005915	2197330	808585	26.90
31	Uttaranchal	440656	375111	65545	14.87
32	West Bengal	1037440	774731	262709	25.32
	<b>Total</b>	<b>14910041</b>	<b>10468694</b>	<b>4441347</b>	<b>29.79</b>

Source: DAC Report 2014, Highlighted data were predicted by author

### Findings

- As per the report of DAC, out of the 32 states - Uttar Pradesh (3005915), Madhya Pradesh (1353410), Maharashtra (1351699), Rajasthan (1339232), West Bengal (1037440) were in the first five places benefited by the KCC i-e based on the call received by the KCC related to agricultural information.

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- On the otherhand Andhra Pradesh (4042), Goa, Diu & Daman (3840), Nagaland (2160), Lakshadweep (1212), Dadra & Nagar Haveli (593) were the states in the least five places those who are make use of KCC service.
- From 2004 to 2014 the total numbers of calls attended by the KCC throughout India were 14910041(i-e 2004 to 2012 the number of calls were 1046864 & 2013-2014 (March) were 4441347). In the year of 2013-2014 0.82% of calls were increased.
- When we compare with the population of India the information distributed the calls were very small. People belonging to central part of the India were in top position to interact with KCC, when we compare with the other parts of India.

### IV. CONCLUSION

Majority of the rural area were under ICT exclusion, because farmers are illiterate and belongs to low income group, they can be encouraged to utilize the ICT facility in their occupation. Availability of internet at low cost is should be achieved by both public & private partnership. Awareness camp should be conducted in each village or block to educate them. Rural information centre should be setup to facilitate farmers to ease use of kisan call centre and other ICT related methods. Wireless Revolution should be take place to overcome the hurdles in ICT implementation.

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