ICT Programmes and Policies for Agricultural Extension in India: A Review

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Abstract

Information and Communication Technology (ICT) in agriculture is an emerging field focusing on the enhancement of agricultural sector in India. It involves application of innovative ways to use ICT in the rural domain. It can provide with accurate information necessary for the farmers this facilitates better Agricultural output. In recent year farmer's attitude to access to agricultural information has changed owing to the emergence of fast network of information and communication technology. Farmers can get the information regarding fertilizers, pesticides, crop patterns and weather forecasting and other information at zero affordable cost. Many of the organizations like government, private, co-operatives and public have also attempted to facilitate the information technology transfer in the agriculture sector. ICT is crucial in facilitating communication and access to information for agriculture and rural development. With this perspective present study is going to find out the relevant ICT applications for agricultural extension in India under the central government initiative with policy perspective.

Keywords: ICT (Information and Communication Technology),Agriculture, Farmers, Policy and programmes.

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INTRODUCTION

Agriculture is one of the predominant sectors in Indian economy. Most of the families are dependent on agriculture sector; more than 60 % of the India's population is engaged in agriculture sector in India.Agriculture sector's contribution is 16% of total GDP in India. The performance of agriculture basically means the performance of small holder farming. It is only by empowering small and marginal farmers to overcome their handicaps that, they can become instruments of green revolution and growth in agriculture sector. ICT in agricultural extension will provide much needed impetus to agricultural sector and ICT can complement the traditional extension system for "Knowledge Resource" delivery to the millions of the farmers. This study explores the role of ICT in agricultural sector with the review of existing ICT policies and programmes of agriculture sector in India.

Theoretical framework

The theoretical conceptualization of technology in economics can be traced back to neoclassical who considered technology to be an exogenous variable to the economic system and this is formally modeled by Solow in the year 1956. They considered technology to be an exogenous variable to the economic system. However, latter economists like Kenneth Arrow, Paul Romar considered technology as an endogenous factor into the growth process and formulated a new set theories called as new growth theories. From 1984 onwards lot of research has been done on this topic and the noble prize for the year 2001 was awarded to the research on 'asymmetric information'. Many of the central theories and principles of economics have been based on assumptions about perfect information. Starting from Adam Smith many economists have laid emphasis on the subject either directly or indirectly. Economist like Schumpeter, Kenneth J Arrow, Fredrick Von Hayek, George AAkerlof, Michael A Spence, Josesph E Stigtliz have made notable contribution to this subject.

LITERATURE REVIEW

Rabindra Kumar Mahapatra (2012), in the work, "Role of Information in Agricultural Development of Odisha", aims to discuss areas of information needs for various stakeholders in agricultural sector in developing states like
Odisha. Access to right information and its proper utilization for the farming community is the order of the day which needs to be practiced in the state. Author suggests that extension professionals should carry publicity materials and disseminate success stories in agriculture to influence farmers who are in need of information.

R.Saravanan (2012), worked on "ICT for agricultural extension in India: policy implications for developing countries". This article which has concisely reviewed ICT projects implemented since 1990's in India, points out the policy implications for the effective ICT based agricultural advisory services in developing countries. Study reveals the significance of national policies with respect to ICT in agricultural extension services in India. It has attributed the successful implementation of agricultural programs to the impact of information and communication technology.

Vivek Ahuja (2011), in the article entitled "A Convergence of ICT and Agricultural Development", has made an attempt to find out the information needs of farmers and enables

holistically in creation of an extended agricultural market through cyber extension. According to this study, developing the capacity of agro-based rural communities through cyber extension with the use of ICT will create opportunities of growth and prosperity and give a chance to Indian agricultural markets for creating a more efficient information and knowledge network. This paper showcases the utilization of ICT for capacity building of agricultural markets through cyber extension.

Robert T.Jensen (2010) worked on "Information, efficiency, and welfare in agricultural market". This study describes the potential role of ICT in agriculture particularly mobile phones, how mobile phones are getting prominent role in agricultural field and specially developing countries are using mobile phones to provide market information. Study reveals that mobile phones are effective as ICT tool for disseminating information.

After reviewing the literature of using of ICT in agriculture sector in India it was found that studies have been done on different dimensions of ICT in agriculture sector involving mobile phones, radio, television, personal computer and Internet farmer's portals for agricultural extension work in India. However, there are very few studies on government policies and programmes promoting ICT in agricultural sector.

OBJECTIVE OF THE STUDY

To review the various government policies and programmes promoting ICT in agriculture in India.

METHODOLOGY

The study is based on the secondary data, which has been collected from different Government reports, reports from department of agriculture and commission reports. Government reports include policy documents viz., agricultural policy, National policy framework for agricultural extension (2000), National policy for farmers (2007), National e-Governance Plan and Knowledge Mission 2007.

REVIEW OF NATIONAL POLICIES ON ICT IN AGRICULTURAL EXTENSION IN INDIA

National policy framework for agricultural extension (2000)

stated that information technology revolution is unfolding and has very high visibility. Harnessing information technology for agricultural extension will receive high point in the policy agenda. Extensive use of modern information technology will be promoted for communication between researchers, extension workers and their farmer clients to transfer technologies and information more cost effectively. Further, it emphasized IT application in marketing, wider use of electronic mass media for agricultural extension, farmer participation in IT programmes and support to the state government for using IT in agricultural extension, promoting IT based information kiosks and capacity building for use of IT (DoA&C, 2000).

National policy for farmers (2007) indicated that the potential of ICT would be harnessed by establishing *Gyan chaupels* (Knowledge centers) in villages. Further, the Common Service Centers (CSCs) of the Department of Information Technology, Ministry of Communications and Information Technology, Government of India and those set up by the state governments and private initiative programmes will be evolved for inclusive broad based development. 'Last mile and last person' connectivity would be facilitated with the help of technologies such as broadband Internet, community radio or Internet-mobile phone synergies (NPFF, 2007).

Document of ICAR Framework for Technology Development and Delivery System in Agriculture (2008) outlined the need for the construction of Agri – India knowledge portal – A single electronic gateway to be developed through a peer review process with the help of 15 content accreditation centres from 15 agro – climatic regions of the country. Each accreditation centres will coordinate with other Agricultural Universities and agricultural institutions in their region for development of content in regional language as well as in English and also do its validation, which will be collected in the central data warehouse integrated in the knowledge portal. The portal will also serve as a platform for facilitation of interaction among researchers and extension personnel in the KVKs through high speed server Intranet (ICAR-FFTDDSA, 2008).

National e-Governance Plan indicated that the typical services envisaged in Agriculture as a Mission Mode Projects (MMP) to provide information to the farmers on seeds, fertilizers, pesticides, Govt. Schemes, Soil recommendations, Crop management, Weather and marketing of agriculture produce. Several projects such as ASHA in Assam, *KISSAN* and e-*Krishi* in Kerala and *Krishi Maratha Vahini* in Karnataka have been initiated by the Department of Agriculture and Cooperation (DoA&C), Government of India. To spearhead implementation of MMP in Agriculture, DoA&C has adopted twin strategy through AGRISNET & two portals AGMARKNET & DACNET (Mathur et al., 2009).

Knowledge Mission 2007

The World Summit on the Information Society (WSIS) held at Turin on November 15, 2005 visualization to 'Connect the World by 2015'. Its aim was to provide and ensure the benefits of the each country by the year 2015, which is also the benchmark year for achieving the UN millennium Development Goals. Information and communication technology (ICT) has been with us for many years, and it has played an imperative task in promoting agriculture and rural development during the last several decades.

The ultimate goal of Knowledge Mission 2007 is to 'Decrease the gap of Rural Urban Digital Divide' and provide knowledge connectivity to every village of India by August 15, 2007. In the light of the above mission, a national alliance has been established, involving 22 Governmental organizations, 94 civil societies, 18 academic institutions and 10 financial institutions and still more to join in the course of the time (Thomas William 2011). The main characteristics of a knowledge society is one that empowers people and communities, increasing the effectiveness of their development efforts through informed decision-making and through their capacity to harness science and various forms for knowledge to achieve the objectives for poverty eradication, food security and sustainable development (Ghosh, 2001).

REVIEW OF PUBLIC SECTOR ICT PROGRAMMES FOR AGRICULTURAL EXTENSION IN INDIA

mKisan

The mKisan project has been launched with the support of mFarmer initiative challenge fund. The International Livestock Research Institute (ILRI), India is implementing the mKisan project in partnership with Handygo technologies, a mobile value adding service provider, CABI South Asia, and Digital Green, an NGO for video enabled extension. The project proposes to develop comprehensive agro-advisory services for small holders with access to mobile phones in India. The project has objectives such as to provide daily bulletins on agro-meteorology, crop pest and livestock diseases outbreaks, market information, and information on local service provision sources and information access to women farmers. The CABI will be providing scientifically validated and actionable information from its "Direct2Farm Repository". mKisan project aims to reach-out one million small holder farmers in the states of Utter Pradesh, Bihar, Madhya Pradesh, Maharashtra,

Andhra Pradesh and Karnataka in India, over a 24 month period (ILRI project profile, 2012).

KisanSuvidha

KisanSuvidha is an omnibus mobile app developed to help farmers by providing relevant information to them quickly. With click of a button, they can get the information on weather, dealers, market prices, agro advisories, plant protection, IPM Practices etc. Unique features like extreme weather alerts and market prices of commodity in nearest area and the maximum price in state as well as India have are other variety of information added to empower farmers in the best possible manner. Recently, in the month of March 2016, Govt of India under mkrishi launched two mobile applications that will enable farmers get information related to crop insurance and prices of agri-commodities in different *mandis* (markets) across the country.

The AgriMarket Mobile App: It has been developed with an aim to keep farmers abreast of crop prices and to discourage them from going for distress sale. Farmers can get information related to prices of crops in markets within 50 km of their own device location using the AgriMarket Mobile App. This app automatically captures the location of the farmers using mobile GPS and fetches the

market prices of crops in markets which fall within the range of 50 km. There is another option to get price of any market and any crop in case farmers do not want to use GPS feature. The prices of agri commodities are sourced from the Agmarknet portal. Currently, this app is available in English and Hindi languages.

Crop Insurance Mobile App: has been developed by the in-house IT division of the Agriculture Ministry and can be downloaded from Google Store or mKisanportal. "Government spends huge amount in extending crop insurance to farmers. Due to administrative and technical reasons, much of the information related to crop insurance do not reach farmers on time to take advantage of the existing schemes. This mobile app will provide complete details of crop insurance. Farmers can get information related to crop insurance cover available, and also calculate the premium for notified crops based on area, coverage amount and loan amount. Farmers can also get details of normal sum insured, extended sum insured and subsidy information of any notified crop in any notified area. Currently, this app is available in English and Hindi languages.

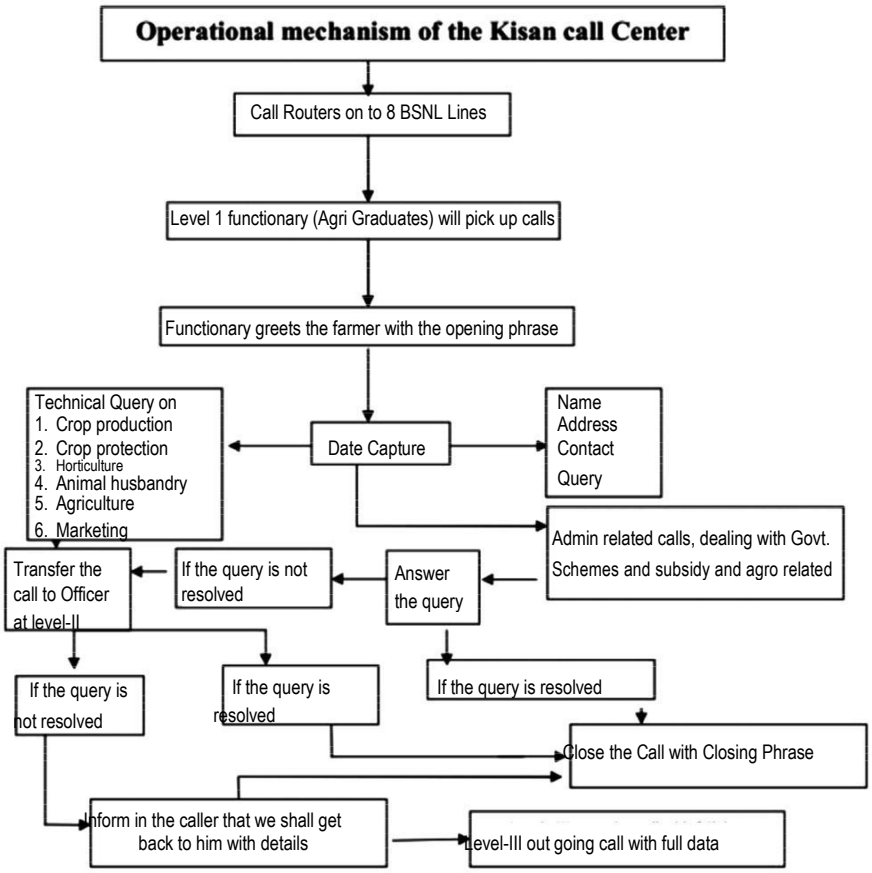
Kissan Call Centre –KCC (Farmer Call Centre)

The Department of Agriculture & Cooperation (DoA & C), Ministry of Agriculture, Govt. of India launched *Kissan* Call Centres across the country on January 21, 2004, to deliver extension services to the farming community. The purpose of these call centres is to respond to issues raised by farmers, instantly, in the local language. There are call centres in every state and the states are expected to handle traffic from any part of the country. Queries related to agriculture and allied sectors are being addressed through these call centres. The Farmer Call Centre is a mixture of two hitherto separate technologies namely, the Information and Communication Technology (ICT) and the Agricultural Technology- both have their specialized domains and work cultures. To optimally utilize the strengths of both these systems, it was proposed to take full advantage of professionally managed Call Centre mechanism and dovetail it with the specialized Subject Matter Specialists knowledge of Agricultural Scientists and Extension Officers, so as to facilitate its reach to the farming community (Saravanan R. and Suchira Dipta Bhattacharjee 2013). A countrywide common eleven digit number 1800-180-1551 has been allotted for *Kissan* Call Centre. The number is accessible through all mobile phones and landlines of all telecom networks including private services

providers. Calls are attended from 6.00 am to 10.00 pm on all seven days of the week at each KCC location.

***Kissan* SMS Portal:**

Kissan SMS Portal was launched on July 16, 2013 for farmers. SMSs to be sent to the farmers can be broadly classified into three categories, viz. information, services and advisories. The content may include information about the schemes and advisories from the experts. Markets have been grouped based on the State, District, Block and the Crops/Activities selected



by a farmer. Officers can send SMS to the farmers belonging to the entire area of their jurisdiction and their preferred crop/activity will help sending relevant messages in regional languages also. The farmers can register to these services by calling *Kissan* Call Center on the toll free number 1800-180-1551 or through the web portal. SMS based registration is also being introduced shortly. Farmers can

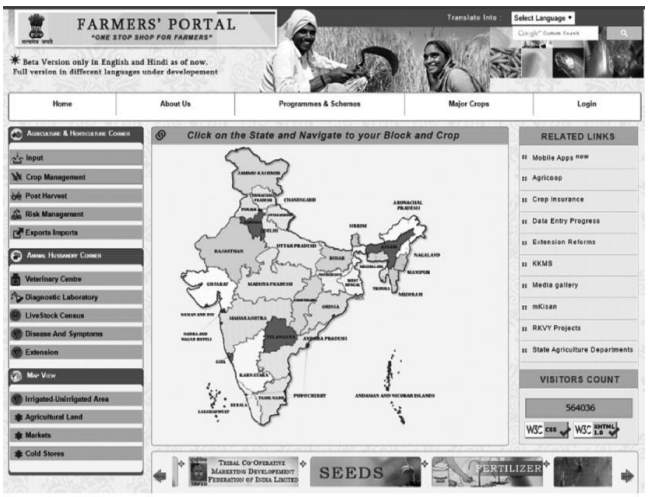
give up to 8 choices for their preferred crops/activities. This also includes activities under Animal Husbandry, Fisheries and Dairying in addition to Agriculture and Horticulture.

Development of Portals

DAC has developed 80 portals, applications and websites (primarily in collaboration with the National Informatics Centre) covering the headquarters and its field offices/ directorates. The important portals include SEEDNET,
DACNET, AGMARKNET (prices and arrivals in *mandis*), RKVY (*Rashtriya Krishi Vikas Yojana*), ATMA, NHM (National Horticulture Mission), INTRADAC, NFSM (National Food Security Mission) and APY (Acreage, Productivity and Yield). DAC is getting the online data entry done right from the district level, so as to expedite the generation of requisite queries and reports in an efficient manner.

Farmers' Portal

This portal aims to serve as a One Stop Shop for all the farmers for accessing information on agricultural activities. Besides giving links to appropriate pages of the 80 portals already developed so far, the Farmers' Portal links the location of the farmer (from his Block) with NARP (National Agricultural Research Project) Zone that he belongs to. Thereafter, all information related to the crops grown in that area (coupled with agro climatic conditions in that region) is then provided to the farmer using a graphical interface. Farmers can get information about a package of practices; crop and seed varieties; common pests; dealer network for seeds, fertilizers and pesticides; machinery and tools; agro-met advisories, etc. Data for most states has been entered in one language, but the portal will be launched after the data is entered both in English and in the regional language of the state.



Source: farmer.gov.i

Table 1 ICT Networks and Digital Information Services in India

Networks	Agriculture Information Services
AGRISNET	Network to facilitate rural agricultural extension services and agribusiness activities
AGMARKNET	A network of 7,000 agricultural produce wholesale markets and 32,000 rural markets
ARISNET	Agricultural research information system network
SEEDNET	Seed informatics network
CoopNet	Network links 90,000agricultural primary credit societies and agricultural cooperative marketing societies to usher in ICT-enabled services
HORTNET	Horticultural informatics network
FERTNET	Fertilizers informatics network
VISTARNET	Agricultural extension information system network
PPIN	Plant protection informatics network
APHNET	Animal production and health informatics network connecting about 42,000 animal primary health centres
FISHNET	Fisheries informatics network
LISNET	Land information system network linking all institutions involved in land and water management for agricultural productivity and production systems
AFPINET	Agricultural and food processing industries informatics network
ARINET	Agricultural and rural industries information system network to strengthen small and micro enterprises
NDMNET	Natural disaster management knowledge network in India

CONCLUSION

ICT has the potential to communicate agricultural information to a large number of farmers simultaneously and swiftly. This will make a major contribution to the Indian agricultural sector. This paper is an attempt to discuss the government initiated few ICT programmes on agricultural

extension and policies with the aim of encouraging the process of successful implementation of ICT in agriculture sector. This study clearly indicates that, ICT if put to use in the right direction proves advantageous and beneficial to farmers but there is need for an exclusive policy on ICT to promote the successful implementation among farming community. This gap or void between the successful implementation and promotion of ICT among farmers requires an efficient policy execution.

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