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Development of Farming with the Help of ICT

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Abstract
The role of ICT in the research institutions is becoming increasingly prominent because of the potential value of such technologies. ICTs can be used to increase effectiveness and efficiency of extension system. So, in this era of information revolution, the agricultural extension Scientists should be encouraged to use ICTs for extension education. The rapid growth in the use of information and communication technologies (ICT) by governments, businesses, private institutions, and civil society has led to key socio-economic developments globally. This widespread diffusion of ICT has enabled more efficient local and global linkages between governments, businesses, and ordinary citizens. It has also led to a significant transformation of people's livelihoods and the development of "information societies" and "knowledge societies". As the modern ICT and related traditional technologies converge, both the effectiveness and efficiency in public service delivery, business performance, global communications, and citizen participation in governance and policy development issues have increased tremendously in the newly emerging information and knowledge societies. It could be very well said that agriculture, though losing its sheen, still occupies predominant position in rural hinterlands. Any amount of growth is not possible in rural lands and populace alike with the links to agriculture getting severed. It could very well be hypothesized that rural India could develop if agriculture could touch some higher notches. This paper was intended to find how ICT tools could be better utilized to deliver farmers and thereby farming better. An attempt has been made to find out how far the farmers use and utilize ICT tools for the agricultural activities. Moreover attempt has also been made to bring out the difficulties of farmers in accessing ICT tools to better their prospects from agriculture. Since marketing has become the major driving force in mapping and sequencing a cropping activity, this paper also tries to bring out the scope of ICT tools in bettering the remuneration of farming community. In short, the paper tries to pinpoint that only when farming becomes a viable proposition rural development would be possible and sustainable.

Keywords: ICT, Agricultural development, Farming community, GDP.

Introduction

Indian Agriculture contributes 22% of our GDP, and approximately 60% Indians derive their livelihood from the agricultural sector. 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 evergreen revolution and growth in agriculture sector. The limiting factors of farmers in maximizing their farm incomes

are access to technology, government endeavor, resources, markets, institutions and services. Farming community is facing lot of problems in maximizing the crop productivity. In spite of successful research on new agricultural practices, the majority of farmers are not getting upper bound yield due to several reasons. One of the reasons is that expert scientific advice on crop production and marketing is not reaching the farming community in a timely manner. There is a concern that the gap between the information rich and information poor is getting wider. The farmer proceeds for farming on the basis of experience. Generally farmers follow the advice of local shopkeepers/agents who sells him seeds, fertilizers, insecticides, pesticides etc. The information need of Indian farmers across the country is varied. Introduction of Information and Communication Technology (ICT) enables the dissemination of requisite information at the right time. This revolution in information technology has made access to the information easy and cost-effective.

Materials and Methods

Reasons of Agricultural Information delay in rural India:

The main purpose of extension is to transfer the agricultural advanced technology and research to the farmer, and feedback of field problems to the research system. Latest information and knowledge on the subject play a major role to full fill this purpose. There is an information delay between farmers and agriculture researcher in India because:

- Media, Information Management and ICT are not properly used.
- Lack of sufficient extension workers.
- Lack of Agricultural information literacy in India.
- Lack of updated agriculture information with the farmers and most of the extension workers.
- Poor technological knowledge of farmers and village level extension personnel.
- Economic problems of rural people.
- The top-down approach is adapted for extension activity. So the linkages between research- extension and farmer remained weak etc.

ICT

Information and Communication Technology (ICT) consists of three main technologies. They are: Computer Technology, Communication Technology and Information Management Technology. These technologies are applied for processing, exchanging and managing data, information and knowledge.

UNIQUE FEATURES OF ICT

- Access to the astounding store-house of information is free
- The information is available instantaneously round the year and twenty four hours a day,

- Communication can also be interactive
- The information is available from any point on the globe
- The communication is dynamic and ever growing.

Any system applied for getting information and knowledge for making decisions in any industry should deliver accurate, complete, concise information in time or on time**.** The information provided by the system must be in user-friendly form, easy to access, cost-effective and well protected from unauthorized accesses. (ICT) can play a significant role in maintaining the above mentioned properties of information as it consists of three main technologies.ICT is an integration of the technologies and the processes to distribute and communicate the desired information to the target audience and making the target audience more participative in nature.

ICT in Indian Agriculture

ICT in agriculture is an emerging field focusing on the enhancement of agricultural and rural development in India. It involves application of innovative ways to use Information & Communication Technologies (ICT) in the rural domain. The advancements in ICT can be utilizes for providing accurate, timely, relevant information and services to the farmers, thereby facilitating an environment for more remunerative agriculture. Given the development scenario in Indian Agriculture, ICT movement is still evolving. However, all the ICT initiatives are not uniform with disparities between regions in the level and quality of telecommunications, information and the effort of individuals, public and private organizations, and differentiated nature of demand of the farmers in different areas. As a result, there have been many successes, failures, lessons learned and experience gained, so far. While these initiatives are intended to address the needs of the farmers through ICT, their actual usage and their ability to bring significant impact on the farm productivity and socio-economic development of the intended beneficiaries is to be understood. It is relatively unknown as to whether the ultimate beneficiaries actually use the facilities provided for them meaningfully to meet their needs. The common problems in adoption of ICT in rural segments are ICT illiteracy, availability of relevant and localized contents in their own languages, easy and affordable accessibility and other issues such as awareness and willingness for adoption of new technologies among the rural peoples etc. One critical aspect in the usage of ICT's for farmers and their groups, as seen in some of the ICT driven initiatives, is the involvement of human interface at the last mile indicating that there is a human dependency in transmission of Information/Knowledge to farmers.

Thus, there is a need to understand as to how far the ICT initiatives are able to address the farmers need so that better solutions can be developed to address those unmet needs. The proposed research aims to study the past and present major ICT initiatives in agriculture in India, the extant of their success, the factors affecting the success as well as failure of such initiatives. Based on this study, the project will develop and suggest appropriate ICT models to meet farmer's information needs for different selected scenarios considering the infrastructural and social-economic constraints with some field testing within the existing infrastructure. The ICT models generated in this project can be expected to provide a

framework for various stakeholders in agriculture in design and implementation of effective ICT based solutions for agriculture.

Important roles which ICT can play are in enhancing agricultural production, improving market access, and capacity building and empowerment.

1) Enhancing Agricultural Production

- Farmers (especially small ones) often face threats from many threats like poor soils, drought, erosion and pests. Key areas where ICT can help improve this is by providing up-to-date information about pest and disease control, early warning systems, new varieties, new ways to optimize production and regulations for quality control.

2) Improving Market Access

- Providing up-to-date information on the market prices of commodities, inputs and consumer trends. This can improve a farmer's negotiating position and their livelihood, while enabling farmers to make better decisions about future crops and commodities, and also the best time and place to sell and buy goods.

3) Capacity-building and empowerment

- ICT technologies can be used to strengthen communities and farmer organizations strengthen their own capacities and better represent their constituencies when negotiating input and output prices, land claims, resource rights and infrastructure projects. Rural communities are able to interact with others via the use of ICT which reduces social isolation that they would otherwise be facing. Besides that, ICT technologies are able to make processes like law-making and land-title approvals more transparent.

ICT in agriculture sector

ICT enables vital information flows by linking rural agricultural communities to the Internet, both in terms of accessing information and providing local content. New information and communication technologies are generating possibilities to solve problems of rural poverty, inequality and giving an opportunity to bridge the gap between information rich and information poor and support sustainable development in rural and agricultural communities. As farming is becoming highly knowledge intensive, commercialised, competitive and globalised against traditional resource based approach, the need to adopt right means to bring in all players of agribusiness, cannot be over emphasized.

Innovations in ICT are of great help in offering a communication platform circumventing all traditional physical barriers and backwardness with its wider reach out and neutrality to social and gender bias; and it's inclusive nature of public and private sectors and its innate strength of offering a reliable, good and cost effective communication platform to various management agencies involved in the extension to and from to the farmers. With these features, ICT will definitely strengthen the current ongoing extension reforms in bridging gaps in access and in bridging rural economy with globalised markets.

Trends in Agricultural Extension in India

The use of information technology and electronic mass media is high priority channel for agriculture extension and dissemination of information to the farming community. Under World Bank funded project i.e. National Agriculture Technology Project (NATP), Innovations in Technology Dissemination (ITD) was started in 1998. The project is currently operational in 28 districts of seven states (four districts in each) namely – Andhra Pradesh, Bihar, Himachal Pradesh, Jharkhand, Maharashtra, Orissa and Punjab. The project focuses on restructuring public extension services and testing new institutional arrangements for technology transfer. Under the project Agriculture Technology Management Agency (ATMA) has been set-up in each of the 28 project districts of seven States. ATMA is a registered society of key stakeholders involved in agricultural activities for sustainable development in the district by integrating research-extension activities and decentralizing day to day of Public Agricultural Technology Dissemination System. All the research, training, development and extension activities run by public, private and other organizations in the district are integrated under ATMA. A State Agriculture Management and Extension Training Institute (SAMETI) is also supported to meet training and capacity building requirement under the Project. The National Institute of Agriculture Extension Management (MANAGE) provides training and capacity building to the Project. The model of ATMA is now being implemented in 252 district of the country. There is intensive use of information technology and media back up. All the research, training, development and extension activities run by public, private and other organizations in the district are integrated under ATMA.

Results and Discussion

ICT initiatives for Agriculture and Rural Development

Under NATP, ICT infrastructure is created in NARS by ARIS in order to bring information management culture. More than 400 ARIS cells have been created in NARS. These cells and their campuses house PC (Personal Computer) workstations, servers, UPS (Uninterrupted Power Supply) and all major network equipment such as switches, hubs, routers, network management, LAN cabling, Internet etc. The basis infrastructure required for linking all ICAR Institutes and SAUs has already been created. These cells are expected to promote the use of information technology in agricultural research, education and extension all over the India. Libraries of NARS are improved with ICT (Hardware, Software, LAN, Internet, Digitization, On-line/Off-line resources etc), under the Library Improvement and Networking of NATP. ICT has been implemented for agriculture extension activity under ATMA. Under NATP, e-Extension by connecting 200 selected KVKs and 8 Zonal Coordinating Units (ZCUs) through an Intranet and Internet has been taken-up by ICAR to strengthen these selected KVKs to enable them to deliver extension services through Internet. These KVKs will be developed as Information hubs. Village information kiosk is supposed to be an Internet connecting node with minimum facilities to link to Internet and provide access to information sources. These kiosks may run on paid basis like STD/ISD telephone booths. Some of the states viz., Andhra Pradesh, Maharashtra, Karnataka, Madhya Pradesh, Kerala, Tamil Nadu etc. have already established such kiosks which are growing at fast pace. Use of ICT for rural development and transfer of

agriculture technology has been done by Government and private organizations (including NGOs). The Ministry of Communication and Information Technology of the Government of India and the Telecom Regulatory Authority of India (TRAI), as well several state governments, have already developed strategies for accelerating the growth of the Internet and broadband connectivity in rural India. Bharat Sanchar Nigam Limited (BSNL) has laid fiber cables capable of reaching nearly 70 per cent of villages. Government of India and State Governments have been working in various e-Governance projects in India.

Till date, the available Indian ICT public service delivery models in Agriculture sector are very few and are mostly in private sector viz., knowledge centers of MSSRF (http://www.mssrf.org/specialprogrammes/ mission_2007_NA/ namain. htm), e-Choupal of ITC, Ikisan of Nagarjuna Fertilizers & Chemicals Ltd and Parrys corner. Besides a number of Agribusiness Corporates viz., TAFE, Mahindra and Mahindra and several others are adopting ICT in their business. The Private sector initiatives are very critical and essential given the strong presence of the corporate in Agriculture sector. In Cooperative sector the often quoted old examples are Dairy Information Services Kiosk (DISK) of NDDB and wired village WARANA. Amongst civil society, GRASSO of West Bengal is pioneering the ICT access in farm sector. Increased realisation of rural markets potential has become a driving force for the interest of corporate.

In government the major ICT based service delivery initiative is limited to

(i) ASHA (www.assamagribusiness.nic.in) initiative of Assam SFAC (Government of Assam) with its networking with large ICT infrastructure (CICs) spread all over the state.

(ii) Kerala is coming up with two different initiatives kissan kerala (www.kissankerala.net) and e-Krishi (www.e-krishi.org/web/main/).

(iii) The Government of Andhra Pradesh is providing agribusiness services through Rajiv Internet Village Centres in partnership with ikisan.The IIIT Hyderabad is experimenting with e-Sagu (http://agriculture .iiit.net/esagu/esagu2004).

(iv) The Uttaranchal state is planning for Kisan Soochna Kendras in private partnership while the Haryana state recently inaugurated its first Agribusiness Information Centre.

(v) The Tamilnadu and Maharashtra are pursuing comprehensive Agrisnet. Several state agricultural universities launched telephonic help lines

(vi) Related to land records the Bhoomi Project of Karnataka state has been one of the highly successful public sector initiatives in the country having direct impact in improving health of agriculture sector and is being replicated in several other states.

Kisan Call Centers (KCCs)

KCCs were launched on January 21, 2004 by the Department of Agricultural and Co-operation. The main technologies involved in Kisan call centers are:

- Desktop computer system with Internet connectivity.

- High bandwidth telephone line (preferably 128 kbps ISDN line).
- Telephones with headphones and teleconferencing facility (if required).

The main aim is to deliver the extension services to the farming community in the local languages. The farmer dials the help line, a toll free number, 1551, and the agricultural graduates provide the initial enquiry. If the queries handled by the agriculture graduates are not satisfactory to the farmers or the farmers want more information, the call is forwarded to level II and level III executives. Thus, KCCs are the important information gateway for farmers. The cost to the farmers is almost zero, and they get the response in their local languages. If needed, the agricultural scientists also visit the field to resolve any further queries.

Conclusion

Each initiative is a unique model in the application of ICTs to agriculture and has merits and constraints of its own. The study also helped in learning lessons from these initiatives for up scaling ICT-based initiatives.

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