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Use of ICT in Extension and Advisory Services

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Introduction:

Agriculture continues to be the most important sector of Indian Economy. Research, extension and farmers efforts contribute significantly in this sector. Need of vibrant, dynamic and innovative approach to be adopted for agricultural extension in order to achieve targeted growth rate and serve the farmers better. Further, Land and water resources are almost reaching their limits; hence achieving food security heavily relies on "Knowledge Resource". It is expected that integration of ICTs in agricultural extension will provide needed impetus to agricultural sector and ICTs can complement the traditional extension system for "Knowledge Resource" delivery to the millions of the farmers. E-Agriculture is an emerging field focusing on the enhancement of agriculture and rural development through improved information and communication processes. ICTs have been establishing themselves for so long as the futuristic tools of teaching and learning. In addition, ICT has become a polynary and systematic concept in the field of education.

ICT in extension and advisory services:

In the context of rural advisory services that support innovation, ICTs have four broad functions.

First, they need to deliver or provide access to information. They should address the need for localized and customized information—adapted to rural users in a comprehensible format and appropriate language—to give small-scale producers as well as providers of advisory services adequate, timely access to technical and marketing information, as well as information or support on new technologies and good farming practices.

Second, they need to organize the knowledge base. ICTs should help document and store information for future use.

Third, ICTs need to connect people and networks. ICTs can facilitate networking—locally, regionally, and globally—thus leading to collaborative and interdisciplinary approaches to problem solving and research based on shared knowledge and collaboration.

Fourth, ICTs need to empower rural communities. ICTs should help farming communities "gain a voice" so that they can convey their needs and demands, negotiate better deals with other actors in value chains, and generally get practical benefits from the services intended for them (and otherwise avoid being exploited). A key element is to use ICTs to give rural people the skills and tools to tell their own stories, in their own words and languages, in ways that reach and influence others.

Throughout the developing world, ICTs are being integrated into classic rural advisory services, through radio, SMS, television, video, Internet, libraries, the media, and

mobile services. Advice and information provided via ICTs is becoming more varied, covering specific technologies and practices; climate change mitigation and adaptation; disaster management; early warning of drought, floods, and diseases; price information; political empowerment; natural resource management; production efficiency; and market access. It is not a one-way flow: ICTs open up new channels for farmers to document and share experiences with each other and with experts.

Some of the e-Agriculture initiatives in India are indicated below.

Sl. No.	Name of the project	Particulars
	Web portals	
1.	aAQUA	Online discussion, archived, multi-lingual and multimedia based. 27674 posts 3.3 million views by 12,964 viewers (www.aaqua.org).
2.	KISSAN Kerala	Content processing and dissemination system. Online information, video channel, Tele-advisory, SMS and GIS based agro-services (www.kissankerala.net).
3.	TNAU AGRITECH Portal	Dynamic portal and e-linkage with research stations and farm sciences centres for agro-advisory services (www.agritech.tnau.ac.in).
4.	AGRISNET Agriculture Resources Information System Network	(AGRISNET) is a mission mode project funded by the comprehensive online knowledge portal to disseminate relevant information to farmers. Under this scheme most of information by portal. Information on 2000 markets agricultural websites. For example, Sikkim AGRISNET (http://www.sikkimagrisnet.org), Andhra Pradesh agriportal Agrisnet Knowledge Portal (http://agriculture.up.nic.in), Tamil Nadu-www.tnagrisnet.tn.gov.in, AGRISNET– Expert Advisory Services (http://www.hp.gov.in/expertadvisory/SignUp.aspx).
5.	DACNET	DACNET scheme, 46 web sites and 39 applications are developed (75 were developed and functional), which include web portals on complete information on 9 crop directorates, extension services, Integrated Nutrient Management, Marketing, Mechanisation and Technology, Economics and statistics (www.dacnet.nic.in).
6.	e-Krishi	Web based farm advisory services, market information, resource library and online expert advisory (www.ekrishi.org).
7.	ASHA	Relevant and need based agricultural information for the farmers of Assam state of North-East India. (www.assamagribusiness.nic.in).

8.	India Development Gateway (InDG) portal	Multilingual portal for agriculture and other rural information. Decentralized content management system by 225 institutional partners and others (www.indg.in).
9.	Rice Knowledge Management Portal (RKMP)	Comprehensive information portal on Rice. Separate domains for farmers, extension personnel and researchers and also e-leaning platform is unique feature of this portal (www.rkmp.co.in).
10.	Agropedia	Agriculture knowledge repository of universal meta models and localized content for a variety of users with appropriate interfaces. Built in collaborative mode in multiple languages. Currently hosts nine thousand pages (agropedia.iitk.ac.in)
	Web Portals for Market Information and Agri-Business Firms' Portal to Farmers	
11.	AGMARKNET	Market information by portal. Information on 2000 markets and 300 commodities in India (www.agmarknet.nic.in).
12.	ITC-e-Choupal	Innovative trading and e-Commerce initiative in agriculture. Reaches 4 million farmers by 6500 e-Choupals spread over 40000 villages of rural India (www.echoupal.com).
15.	Mahindra Kisan Mitra	Mahindra and Mahindra Ltd., Farm Equipment Sector of the Mahindra Group hosted MahindraKisanMitra.com, a web portal for the Indian farmers to access wealth of information which is updated on a daily basis. Farmers can check daily mandi prices, read weather updates, latest crop advisories, and agri related news. The site also provides information under various other sections such as crop information, loans, insurance, mandi database, cold storages/warehouses and agri events (www. mahindrakisanmitra.com).
16.	IFFCO Agri-Portal	Information for farmers in local language. Web portal and 100 farmers' information kiosks in 16 States (Patil et al., 2009) (www.iffco.nic.in).
17.	Agrowatch Portal	The agriwatch.com is the largest agribusiness portal in India and enables access to a large amount of agribusiness related information covering more than 15 sub sectors within the agricultural and food Industry. The daily, weekly and fortnightly Agriwatch trade research reports are published (Patil et al, 2009) (www.agriwatch.com).
18.	iKissan	Agriculture information; Crop specific package of practices

		of crops, animal husbandry, aromatic and medicinal plants, agricultural machinery, allied agriculture, sprayers, rural credit, insurance iKisan crop solutions; farmers have a critical need to get timely solutions for protecting and nurturing their crops to get best yields. Addressing this key need, iKisan has developed easy-to-use diagnostic packages for different crops which will be provided on demand. Further, it also provides local agri news, weather and market information to the farmers (http://www.ikisan.com).
	VKCs/ VRCs/CICs/ CSCs	
19.	Village Knowledge Centres (VKCs)- M.S. Swaminathan Research Foundation (MSSRF)	101 VKCs in Tamil Nadu, Puducherry, Maharashtra, Orissa, Andhra Pradesh and Kerala state of India. VRCs and VKCs working with 315 partners for implementation and location specific content generation (Senthilkumaran, 2011). Demand driven information and knowledge with support services, social inclusion, community ownership and partnership proved critical for the success and sustainability (www.mssrf-nva.org).
20.	Village Resource Centres (VRCs) –Indian Space Research Organisation (ISRO)	473 VRCs have been set up in 22 States/Union Territories in India. The VRCs are connected to Knowledge/Expert Centres (ECs) like Agricultural Universities and Skill Development Institutes (SDI). Over 6500 programmes have been conducted by the VRCs in the areas of agriculture/ horticulture, fisheries, live stock, water resources, telehealth care, awareness programmes, women empowerment, supplementary education, computer literacy, Micro credit, micro finance, skill development/ vocational training for livelihood support etc. So far, over 500000 people have availed VRC services (www.isro.org/scripts/villageresourcecentres.aspx)
21.	Community Information Centres (CICs)	Community information centres in North-East India e-Infrastructure for accessing rural information needs of farmers and others (http://www.cic.nic.in/).
22.	Common Service Centres (CSCs)	Web based e-governance to services, including agriculture information to rural areas. So far 96,163 CSCs were rolled out in India (www.csc-india.org).
	Telephony/ Mobile Telephony	
23.	Farmers Call Centre (Kissan Call Centre)	32 Farmers Call Centres, 2043636 farmers calls' answered during 2010-11, total calls answered during last

		five years (2005-2010) was 6247911.
24.	Lifelines India	Connectivity by innovative mix of internet and telephony. Reaches 200000 farmers in three States of India (www.lifelines-india.net).
25.	IFFCO Kisan Sanchar Limited (IKSL)	Voice messages in local languages. 95,000 voice messages delivered and 81000 Q&A repository with 5000 feedback messages from the farmers. 10 Lakh active farmers benefiting from IKSL's Value Added Services and IKSL enrollment crosses 4 million and 40000 cooperative societies as IKSL Retailers (www.iksl.in).
26.	Fisher Friend	QUALCOMM, MSSRF, Tata tele services and Asute system technology jointly implemented mobile based advisory services (instant access to helpful information such as weather conditions, where they can and cannot fish and market prices) to fishing communities of costal Tamil Nadu since, 2007. Due to technical challenges and availability of services only 5 nautical miles created mixed impact. Some of successful case studies on mobile services impact were reported by Mittal et al., 2010.
27.	Reuters Market Light (RML)	Micro-information Services designed specifically for the farming community was launched by RML in 2009. Currently covers over 440 crops and varieties with more than 1400 markets and 2800 weather locations of 15000 villages in 13 States of India. Timely and personalized information and individual farmers have reaped significant return on their investment achieving up to INR 200,000 ($ 4000) of additional profits, and savings of nearly INR 400,000 ($8000) by using RML (www.reutersmarketlight.com).
28.	Mobile Advisory Services by Krishi Vigyan Kendras (KVKs) of Indian Council of Agricultural Research (ICAR).	Mobile advisory services to the farmers by the Krishi Vigyan Kendras (Farm Science Centres) are operational in India since, 2010.
29.	e-Arik	Internet, Offline CDs and farmer-to-farmer communication, conventional extension methods. A study among 300 farmers indicated that an average Rs. 5252 was increased among 73 number of e-Arik registered farmers who weregrowing Khasi mandarin. Similarly, an average Rs. 1611was increased among 258 paddy farmers who were

		registered with e-Arik initiative. The cost and time indicators comparing traditional extension system and e-Arik project, sixteen fold and three fold less time were required to the clientele availing and extension system delivering extension services, respectively. Further it is also reported that 3.4 fold economic benefit as compared to the expenditure of deploying e-agriculture prototype and traditional extension system (www.earik.in).
30.	e-Sagu	Agro-advisory services by digital photographs and coordinators for 3035 farmers (4130 ha). Benefited Rs. 9491(USD 240) per ha (www.esagu.in).
31.	Digital Green	Farmer participatory video for agricultural extension. 1681videos produced and 60313 farmers involved. Increased seven fold more adoption of farm practices and ten times more effective per dollar spent as compared to traditional extension system (www.digitalgreen.org).
32.	Knowledge Share Centres	Information by touch screen kiosks, IVRS, bilingual web portal and awareness created by screening films & CDs by the Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad. Project covered 51 villages in eight districts of Andhra Pradesh State in 2011(www.naipsri.org/ikisan)

Impact of ICT For Agricultural Extension Initiatives In India

Systematic and comprehensive impact studies on application of ICTs for agricultural extension are not available. Digital Green project increased the adoption of certain agriculture practices seven-fold over a classic extension approaches. Digital Green project was shown to be ten times more effective per dollar spent. Further, 85 per cent of adoption of improved technologies achieved as against 11 per cent of adoption by traditional extension methods. Similarly e-Sagu prototype increased income of the farmers for the tune of INR. 3075 (63 USD) per ha and also reduced the pesticide usage. Further, their rudimentary estimate of economic advantage indicated that if the e-Sagu prototype used for 1000 farmers, overall net benefit with the proposed ICT based system is INR 100 Million (USD 204800). The cost and time indicators comparing traditional extension system and e-Arik (e-agriculture) project, sixteen fold and three fold less time were required to the clientele availing and extension system delivering extension services, respectively. 3.4 fold economic benefit as compared to the expenditure of deploying e-agriculture prototype. There was positive social side effects and other qualitative results of Digital Green project on participatory video for agricultural extension.

Lessons From ICT For Agricultural Extension Initiatives In India

1. Pilot Project Syndrome
2. Unsustainable Large Investments
3. Users Unwilling to Pay

4. Small Scale of Operation
5. Knowledge Middle Men with Less Permanency
6. Information alone not for Development
7. Difficulty in localization of Content
8. Generic Information
9. One-Way Information Flow
10. Islands of Learning
11. Lack of Systematic Evaluation
12. Lack of Co-ordination

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