

NOTE 11: Navigating ICTs for Extension and Advisory Services

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There is plenty of information available in the public domain that covers various aspects of extension and know-how about new methodologies for implementation. However this information is often scattered and presented in complex academic language. Hence practitioners, who often have very limited time and/or may only have basic formal education, find it difficult to make use of this information.

The Global Good Practices Initiative aims to bridge this gap by providing information about extension approaches and methods in easy-to-understand formats. As part of this effort, it makes "Good Practice Notes" available to all at www.betterextension.org. This Note contains one of the extension methods included in this series.

Introduction

Improved availability of, and access to, information and communication technologies (ICTs) – especially mobile phones, computers, radio, internet, and social media – has provided many more opportunities for collection, processing, storage, retrieval, managing, and sharing of information in multiple formats. Some of these applications, such as tele-centres, web-portals, call centres, mobile apps, community radio, digital videos, audio and video conferencing, and e-learning platforms, have the potential to provide a wide range of services (information, awareness, promotional, advisory, knowledge, technology transfer, training, education, and much more) to farmers and other agricultural innovation system (AIS) actors in a timely, comprehensive, cost-effective, and interactive manner. However, the high number and rapidly changing availability of ICTs may leave extension managers confused as to which methods are available and when to use them. This note explains how to navigate the many types and gives tips on when to use them.

Philosophy and principles

ICTs can enable information and knowledge access and sharing among AIS actors, thus complementing conventional extension advisory methods depending on the situation and target group. The guiding principles^{1,2,3} of ICTs for better extension and advisory services (EAS) are:

- **Relevant content:** Contextualised or farmer-specific, needs-based, timely, and quality content are the major aims of ICT-based extension and advisory services. ICTs are a tool and only help to share content; they do not generate content.
- **Appropriate tools:** Among a variety of ICTs, choose the formats, channels, tools, devices, and applications that best match the purpose, content, and clientele.
- **Integration of methods, actors, and services:** Integrating ICTs with other conventional extension methods (like farmer field schools, participatory extension, and demonstrations) and pluralistic actors (public, private and farmer-based organisations) along the value chain will create synergy in EAS.
- **Information PLUS:** To convince the clientele, show and tell. ICT-based information alone is not enough and needs to be combined with field demonstrations, exposure visits, group discussions, and other conventional methods. Not just advisory information, but a complete resource package across the agricultural value chain⁴ needs to be provided.
- **Human element:** Development of ICT 'champions' to create a legacy of promoting continuous leaders and followers is important for continued commitment of the extension stakeholders to use ICTs.
- **Complementarity to EAS:** ICTs can play only a complementary role in extension. If used appropriately,

¹ Saravanan, R. (ed.) 2010. *ICTs for agricultural extension: Global experiments, innovations and experiences*. New Delhi, India: New India Publishing Agency (NIPA).

² Saravanan, R. 2013. e-Agriculture prototype for knowledge facilitation among tribal farmers of North-East India: Innovations, impact and lessons. *Journal of Agricultural Education and Extension*. 19 (2): 113–131. Available at: <http://www.tandfonline.com/doi/abs/10.1080/1389224X.2012.718247>

³ World Bank. 2011. *ICT in agriculture: Connecting small holders to knowledge, networks, and institutions*. e-Source Book. Report no. 64605. Washington, DC, USA: The World Bank. Available at: <http://www.ictinagriculture.org/content/ict-agriculture-sourcebook>

⁴ Saravanan, R. 2011. *e-Arik: Using ICTs to facilitate "climate-smart agriculture" among tribal farmers of North-East India*. ICTs and Agricultural Adaptation to Climate Change Case Study. Manchester, UK: Centre for Development Informatics, University of Manchester. Available at: http://www.niccd.org/sites/default/files/NICCD_AgricAdapt_Case_Study_eArik.pdf



they create synergy and better impact when combined with conventional extension efforts.

- **Institutionalising ICTs:** Institutional policy and guidelines for use, development of ICT literacy, ensuring competency of staff, and infrastructure development should be integral parts of the institutional set-up for use of ICTs.
- **Long-term and continuous engagement with ICTs:** To get better outcomes, ICTs need to be integrated with conventional extension approaches for a reasonably (at least five years) long period.

Implementation

Broad areas of ICT implementation⁵: ICT-based extension advisory methods are relevant in areas such as pre-production, production, post-harvest and marketing, financial services (credit, payment, savings, insurance), and gathering and distributing of climate and other data. The list below and Table 1 indicate which ICTs to use to achieve five broad aims⁶:

- **Offering localised and customised information, advisory, and other services:** Farmer call centres, mobile apps, radio, TV.
- **Helping to create, document, store, retrieve, share, and manage information:** Web portals, crop-specific portals, knowledge banks, expert systems, agricultural information management systems.
- **Enabling collaboration, sharing, and partnerships for innovation among extension actors:** Social media, discussion groups.
- **Enabling farmers and others to 'gain a voice':** Community radio, tele-centres, videos, virtual communities of practice and social media.
- **Facilitating capacity development of farmers, extension professionals, and other AIS actors:** E-learning mechanisms (open distance learning, learning object repositories, massive open online courses, and other e-learning mechanisms), training by using ICTs, survey and monitoring tools, and applications.

Implementation steps of ICT-enabled EAS: As discussed earlier, appropriateness of ICTs depends on the situation, and their use is most successful as a catalyst of development. To use them effectively, a series of logical steps needs to be followed (Figure 1). While the steps may be indicative of the logical delivery of ICT projects, they are not absolute in any terms, but depend on the situation and best judgements of the extension organisation, based on detailed need assessment surveys of clientele and other stakeholders.

1. **Needs assessment:** EAS is most useful and applicable when the information and services provided are localised and needs based. So for ICT projects to be successful, the first and foremost action of the host organisation should be a needs assessment of the target community.

2. **Benchmark survey:** Standards or points of reference are very important for ICT-enabled services to meet their objectives and this makes benchmark surveys a necessity. They are also useful as standards of monitoring and evaluation.
3. **Content development:** Localised and customised content needs to be developed, based on the results of the needs assessment and benchmark surveys to avoid blanket recommendations.
4. **ICT selection, development, and testing:** Based on localised needs, content, and target groups, the appropriate ICT tool needs to be selected, developed, and pilot-tested for determination of suitability.
5. **Awareness programmes and registration:** One major drawback in ICT projects is lack of awareness of target users of the project's existence or benefits. To solve that, innovative campaigns need to be conducted to make the intended audience aware of the projects. This is especially important in the case of subscription-based services, as the users need to register to receive the benefits.
6. **Extension, advisory, and other services:** Based on demand and needs of the users, the services are to be provided to the targeted groups.
7. **Partnership and integration of services:** Depending on the needs of the project and the services provided, stakeholders need to collaborate to determine which services can be integrated to avoid duplication and provide quality service to the users.
8. **Monitoring and stabilisation:** Continuous monitoring is an important function, especially in the pilot phase, to determine the suitability of the project for target users and modifications should be made accordingly to the services offered to ultimately scale up the project in a profitable manner.

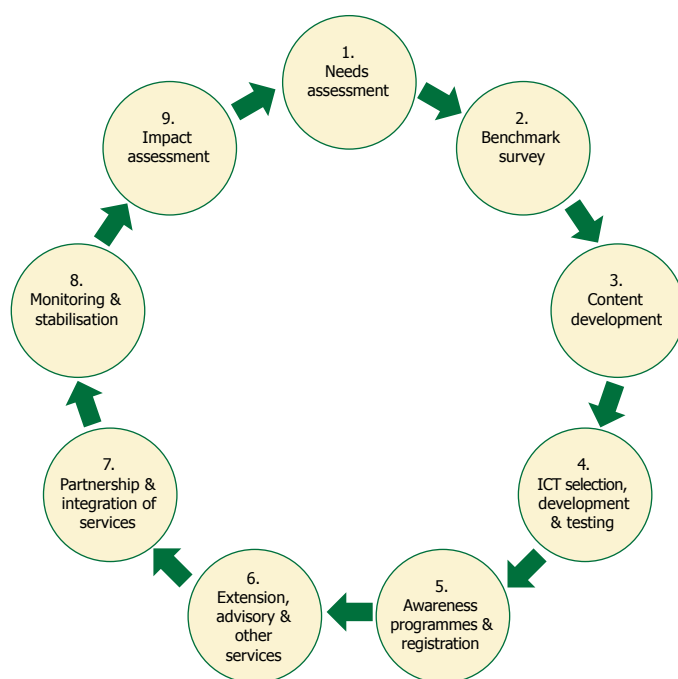


Figure 1. Steps for implementation of ICT enabled EAS

⁵ World Bank. 2011. Op. cit.

⁶ Saravanan. 2011. Op. cit.

Table 1. Appropriateness of use of different ICTs for various functions

***** appropriate *** moderately appropriate *less appropriate

Functions		Information and Communication Technologies (ICTs)														
		TV		Radio		Mobile phones (basic/feature)		Computer/laptop/smart phones								
		TV broadcasting	Video with DVD	Radio broadcasting	Community radio	Text	Voice	Without internet		With internet						
								Expert systems/ decision support systems/interactive multimedia CDs	Digital video	Animation	Website/web portal/ knowledge banks/ online repositories	Tele/video conference	Mobile apps	e-Learning platforms	Social media	
Offering localised and customised information, advisory, and other services		***	***	*****	*****	*****	*****	*****	***	*	***	***	*****	*	*****	*****
Helping to create, document, store, retrieve, share, and manage the information		***	*****	***	*****	*****	*****	*****	*****	***	*****	*	*****	***	*****	*****
Enabling collaboration, sharing, and partnerships for innovation among extension actors		*	*	*	***	***	***	*	*	*	*****	***	*	***	*****	*****
Enabling farmers and others to gain a voice		*	*	*	*****	***	***	*	*****	*	***	***	***	*	*****	*****
Facilitating capacity development of farmers, extension professionals, and other AIS actors		***	*****	***	*****	*	*	*****	*****	*	*****	***	*****	*****	*****	*****

9. **Impact assessment:** This remains one of the most important steps in implementation of ICT projects, as the impact ultimately determines the degree of success of the project in bringing about the desired changes in the target group, as well as the factors deciding its long-term sustainability.

Capacities required and how to develop them

First and foremost, the main capacity needed for using ICT-enabled services and social media is basic knowledge of how to use the devices and navigate the internet. Advanced technical knowledge and computer skills are needed for hosting web portals, e-learning platforms, mobile app development, maintenance of tele-centres, and others.

Development of ICT applications needs situation-specific strategies. Awareness creation, needs-based, location-specific content creation, and inclusion of farmers in creating contents can go a long way in developing the relevant content. Also, specialised training on the use of ICTs and content development for employees can be helpful in increasing the quality of the services and glitch-free maintenance of the ICTs.

Governance

Partnership and maintenance: ICT projects can either be individually maintained by the host institution or handled in collaboration with other stakeholders depending on the application. While programmes for TV, radio, DVDs, social media, and mobile apps (mApp) can be produced by extension organisations or individuals, multi-stakeholder collaboration is very much necessary for mobile-based advisory services, web portals, e-learning platforms, expert systems, and decision-support systems.

Roles of stakeholders: Stakeholders in ICT projects may have multiple roles, the most important being hosting, content creation, maintenance, and funding. The type of ICT project determines the role of stakeholders involved. The host organisation also plays the role of facilitator to maintain collaboration among the stakeholders whenever needed.

Costs

The cost of developing and using ICTs varies greatly depending upon the infrastructure and scale of coverage. For applications like social media, the cost incurred may just be few US dollars for devices and data charges,

while for complex applications like web portals, e-learning platforms, mobile apps, expert systems or decision-support system development, the cost may go up to several million US dollars. Capacity development activities and maintenance also require considerable cost. Some indicative costs for common requirements are: creating a basic website – US\$300–2,000; content management system (CMS) integration – US\$2,000–10,000; advanced web portals with added features may cost US\$10,000–60,000 depending on the design; maintenance of web portals also requires considerable cost. Expert systems may cost US\$1,000–10,000 depending upon the design, software, and size of contents. mApp development can range from free of cost to US\$70,000 or more depending on its architecture and features.

Strengths, weaknesses, opportunities and challenges

ICT applications are diverse, and their suitability varies based on the context of their use and the type of application used.⁷ But sticking to the broad concept of ICTs for EAS, Table 2 gives a general and overall idea of their strengths, weaknesses, opportunities, and challenges in EAS.

Best-fit considerations

Target groups: The suitability of the wide range of services that can be provided through ICTs depends on the target group. ICTs like TV, radio, video, tele/video conferences, and voice-based mobile advisory services are accessible to all, irrespective of literacy level or technological skills, whereas applications like web portals, expert systems, decision-support systems, text-based mobile advisory services, e-learning platforms, and social media are more useful for literate farmers with basic technical skills. Community radio provides a very good platform for women farmers to voice their opinions.

Functions: Awareness creation and technology transfer are the most important functions of TV, radio, videos, and community radio; advisory and market information are the most important functions of mobile-based advisory services; advisory and technology transfer are principle functions of expert systems, decision-support systems, and interactive multimedia CDs; web portals provide unique opportunities for information sharing and linking with other stakeholders of AIS. E-learning

Table 2. Strengths, weaknesses, opportunities, and challenges

Strengths	Weakness	Opportunities	Challenges
<ul style="list-style-type: none"> Better access to services Cost-effective Timely Anytime, anywhere Supplement the role of extensionists Better research–extension–client system linkages 	<ul style="list-style-type: none"> Success depends on human commitment Lack of personal touch Needs ICT skill and competency Lack of institutional ICT policy Long-term sustainability depends on funding, champions and other factors 	<ul style="list-style-type: none"> Continuous improvement of ICT infrastructure Penetration of high-end mobile phones Reducing cost of ICT infrastructure and services Multiple players in EAS services provision using ICTs 	<ul style="list-style-type: none"> Creating farmer-specific and relevant content Language barriers Low literacy of rural farmers Imparting ICT skills to EAS stakeholders Duplication and contradictory information flow

⁷ Saravanan. 2010. Op. cit.



Table 3. Appropriateness of types of ICTs to achieve various EAS functions

***** appropriate *** moderately appropriate * less appropriate – blank cell denotes not appropriate

Extension functions	Information and Communication Technologies (ICTs)													
	TV		Radio		Mobile phones (basic)		Computer/laptop/ smart phones							
	TV broadcast	Video with DVD	Radio broadcast	Community radio	Text	Voice	Expert systems/ interactive multimedia CDs	Digital video	Animation	Web site/ web portal/ knowledge banks/ online repositories	Tele/video conference	Smart phones/ mobile apps	e-Learning platforms	Social media
Awareness	*****	***	*****	*****	*	*	*	*****	*****	***	*	*****		*****
Information	*****	*****	*****	*****	*****	*****	***	*****	*****	*****	***	*****	***	*****
Promotional	***		***	*	***	***	*	***	***	***		*		***
Advisory	***	***	***	*****	***	*****	*****	***	*****	***	***	*****		*****
Knowledge sharing	*****	*****	***	***	***	***	***	***	***	*****	*	*****		*****
Documenting & sharing Indigenous Technical Knowledge (ITK)	***	*****	*	*****	*****	*****	*****	***	***	***	*	*		*****
Technology transfer	*****	*****	***	*****			*****	*****	***	*****		***		*****
Training		***						***						
Education/ e-learning	*	***	*	*	*****	*	***	***		***	*	*****	*****	*****
Market information & linking					*****	*****				***				
Credit and banking access					*****	*****				***				
Input linking	*		*	***	*****	*****				*****		*****		***
Mass advisory	*****	*	*****	*****	***	***		*	***	***		*****		*****
Business planning												***		
M&E, enumeration, survey										*****		*****		
Linking with AIS actors					*		*****			*****		*****		*****
Feed back							*****			*****	***	*****	***	***
Target groups	Farmers, agripreneurs, input dealers, stakeholders in value chain, extensionists	Farmers, agripreneurs, extensionists	Farmers, agripreneurs, input dealers, stakeholders in value chain, extensionists	Women farmers, agripreneurs, stakeholders in value chain, input dealers	Literate farmers, agripreneurs, input dealers, stakeholders in marketing channels, extensionists	Farmers, agripreneurs, input dealers, stakeholders in marketing channels, extensionists	Literate farmers, agripreneurs, extensionists, agripreneurs	Farmers, agripreneurs, extensionists	Illiterate farmers, extensionists	Literate farmers, agripreneurs, input dealers, stakeholders in marketing channels, policy makers	Farmers, extensionists	Mostly literate farmers, entrepreneurs, input dealers, stakeholders in marketing channel and value addition, extensionists	Extensionists, researchers, academicians, farmers, agripreneurs, policy makers	Literate farmers, agripreneurs, input dealers, stakeholders in marketing channels, extensionists, research and academic institutions, experts, policy makers

Source: Modified from: Bell, M. and Payne, J. 2011. *ICT options to enhance agricultural extension. The MEAS ICT Matrix*. Available at: <http://www.meas-extension.org/resources/ict>

platforms are mostly for educational purposes; and social media integrates all functions of advisory, knowledge sharing, awareness creation, linking with AIS actors, and technology transfer (see Table 3).

Evidence of impact and potential scalability

Impact indicators: While before–after comparison of knowledge is an important impact indicator of broadcast services, the time and cost saved, increased income, and better market decisions and participation can be important impact indicators for web- and mobile-based advisory services. Continuous engagement of users in discussions, creation and sharing of contents, increase in the membership subscription, and feedback of members can serve as impact indicators for social media.

Potential scalability: Scalability still remains a major problem in ICT projects after nearly three decades of their use in EAS, mainly because there is no fixed roadmap for success. Scalability is very much dependent on the context of use and can best be suggested by continuous monitoring and evaluation and user feedback of applicability of the information and advisory services provided.

Issues of sustainability of the approach

There is more than one factor that influences sustainability of ICT initiatives. Profit-oriented or financially sustainable services are more user demand-oriented, as subscription is important to meet operational expenses and for the project's financial sustainability. Customised demand-based information and advice on ICTs are not choices but a necessity for long-term sustainability. Applications like social media, mApps, and mobile- and web-based farmer specific advisory services enable high user engagement and help them to customise the information they retrieve, thus making it personalised and applicable, which in turn ensures the long-term sustainability of ICT projects.

Training materials and resources

CGIAR: <http://ictkm.cgiar.org/>

CTA: <http://www.cta.int/en/category/featured-items/icts-for-development.html>

FAO: <http://www.e-agriculture.org>

IICD: <http://www.iicd.org>

IMARK Group: <http://www.imarkgroup.org> (Information Management Resource Kit)

Inveneo & FHI 360's TechLab: <http://www.ictworks.org>

MEAS: <http://www.meas-extension.org/resources/ict>

USAID: <http://www.usaid.gov/what-we-do/economic-growth-and-trade/infrastructure/information-communication-technology-development>

World Bank: <http://www.ictinagriculture.org>



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