



## Agricultural Innovation Program (AIP) for Pakistan

# Information Communication Technology (ICT) in Agricultural Extension in Pakistan: Findings and Proposed Next Steps

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AIP Working Paper

March, 2016

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AIP partners:



This report was made possible by the generous support of the American people through USAID. The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the United States government.

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e-Pak Ag - "Using ICT to make credible, relevant information more available to those helping farmers in Pakistan"

## Executive Summary

Pakistan, similar to many other countries, has a very active and growing sector exploring the use of Information Communication Technology (ICT) to help farmers. However, just like in many other countries, the success in using ICT is variable. Given this dilemma between potential benefit and actual impact, the Agricultural Innovation Program for Pakistan (AIP) supported the University of California, Davis to look at how ICT could better help farmers in Pakistan. This ICT initiative, called “e-Pak Ag”, aimed to “enhance the use of ICT to make credible, relevant information more available to those helping farmers in Pakistan.”

e-Pak Ag is on-going and involves 1) stakeholder consultations, 2) reviews and studies, and 3) best practice identification and sharing. The activity combines lessons learned both in Pakistan and from other countries. The initiative engages farmers, private sector, public organizations (extension, research and academia) and civil society.

In related discussions with the Ministry of Information Technology and Telecom (MIT), a series of “pressure points” were identified for influencing and improving the use of ICT in Ag Extension (i.e., what are the key elements to consider in building a successful system to use ICT to better provide farmers with the information they need). Those key elements to consider are:

- 1) Appropriate policies and Infrastructure
- 2) Capable ICT users
- 3) Content that is needs-driven, credible and relevant
- 4) Delivery channels that get the information where it is needed, when it is needed and in an understandable form.
- 5) Feedback to improve each aspect of the system

Informed by these activities, and within the above 5 part context, six opportunities and sixteen related activities to improve ICT use in Ag Extension in Pakistan have emerged, namely:

### **Opportunity 1: Improve coordination of national ICT in Ag efforts**

**Issue:** There is limited understanding of and limited sharing between the major players using ICT in Ag Extension.

#### **Activities:**

1. **National Conference(s)** to harmonize current understanding of the present situation
2. **Continue consultation workshops** to identify mechanisms to enhance coordination and share lessons learned.
3. **Create a Database** of active ICT in Ag providers and their resource Apps or web sites

### **Opportunity 2: Improve the understanding of farm audiences and their specific needs**

**Issue:** Farmers’ needs (including “location specific” information and the needs of youth and women) are rarely collected or analyzed.

**Activities:**

1. **Raise awareness** amongst extension and information providers of the need to be demand-driven.
2. **Promote tools and skills** to help identify audience needs and interests at the farm level.
3. **Build capacity** of extension service providers on ICTs (training can be provided through UC Davis & Outreach chair of US-PCAS AFS)

**Opportunity 3: Provide solutions that are credible and relevant**

**Issue:** There is a huge data bank of farming material , but it is not always relevant, credible, reliable or easily available.

**Activities:**

1. **Coordinate** between those providing information and the delivery agents.
2. **Establish a mechanism** (possibly a portal) for wider access to credible technical information available from different sources
3. **Identify practices** and protocols to ensure information is demand-driven, available, validated, credible, relevant and trusted.

**Opportunity 4: Clarify the key elements of the message to ensure relevance:**

**Issue:** Material is often unclear in its message.

**Activity: Information format** Conduct workshops and provide materials to ensure the information to be delivered focuses on the key information needed by the users.

**Opportunity 5: Package and deliver the message in ways most relevant to the target audiences:**

**Issue:** Material is often not well packaged, presented or reaching the audience.

**Activities:**

1. **Conduct workshops** and provide materials to help make sure the key information is packaged to be interesting and actionable. Promote the appropriate use of pictures, graphics, voice, local language materials.
2. **Identify communication pathways** and establish strategies to get the right information to the right people using traditional and ICT methods (e.g., integrate the use of cell phones with other mechanisms to better meet information needs such as considering call centers and village level access)
3. **Continue Gender and ICT work** (e.g., AAUR) to better identify ICT channels and needs to better meet female information needs.
4. **Build ICT capacity** among users and potential users.
5. **Share best practices** for identifying and validating information required, how to best use ICT and how to best develop materials for delivery.

**Opportunity 6: Evaluate efforts to improve ICT usability**

**Issue:** There is little information on what works, what doesn't work, and ways forward.

**Activity: Develop strategies** for effective evaluation and identify ICT tools that can help with collecting feedback and field implementation data.

## Background – About e-Pak Ag

ICT has the capacity to be used in many ways in agricultural extension (Appendix 1). However, many ICT in Ag efforts (especially those related to extension) are ineffective. The question then is “how can the impact of ICT in Ag be improved?”. Seeing the need and potential related to ICT use, USAID supported “e-Pak Ag” (Appendix 2) with the goal to “enhance the use of ICT to make credible, relevant information more available to those helping farmers in Pakistan.”

## Objectives

The objectives of e-Pak Ag are:

1. Understand present use of ICT in Ag Extension and how farmers access information,
2. Identify opportunities to enhance ICT in Ag Extension use, and
3. Facilitate sharing of good (“Best”) practices in the use of ICT for Ag Extension

When e-Pak Ag started in 2013, it was clear that there were already a number of ICT-based materials and initiatives active in Pakistan (Appendix 3). The question then became “How could e-Pak Ag best complement and build on these efforts?” The result was an e-Pak Ag effort designed to:

1. Add value to existing initiatives
2. Move beyond being (“just another”) website
3. Identify and work with others to identify and share good ICT practices in Ag extension for Pakistan.



**Participants at one of the 7 ICT consultation workshops.**

The project engages a broad range of ICT stakeholders and users including: public and private service providers, universities, government extension and research, NGOs, farmers and academia.

## Key Partners

Along with UC Davis, the key AIP collaborating **project partners** for e-Pak Ag are The international Maize and Wheat Improvement Center (CIMMYT), The Pakistan Agricultural Research Council (PARC), the International Rice Research Institute (IRRI), The International Livestock Research Institute (ILRI), and the World Vegetable Center (AVRDC).

The key **implementing partner** for e-Pak Ag is Dr. Babar Shahbaz of the University of Agriculture Faisalabad. Dr Shahbaz is leading the stakeholder consultations and a series of research studies to better understand current and potential ways to improve the use of ICT. In addition, Dr. Aneela Afzal of Per Mehr Ali Shah Arid Agriculture University Rawalpindi (AAUR) is working to understand gender and ICT use in agriculture. Dr. Badar Naseem (AAUR) has provided strong support for and input on consultation workshops.

## Events Implemented

Phase 1 of e-Pak Ag involved Dr. Shahbaz holding a series of seven consultation workshops across the country to collect information on existing ICT efforts and suggested improvements for more effective use. Consultations were implemented at:

1. University of Agriculture, Faisalabad (23rd June, 2014)
2. NARC, Islamabad (8th January, 2015)
3. Agriculture House, Lahore (25th February, 2015)
4. UAAR, Rawalpindi (21st May, 2015)
5. Sindh Agricultural University, TandoJam (4th August, 2015)
6. e-Agriculture, Expert Group Meeting, NCRD, Islamabad (10th August, 2015)
7. ICT in Ag workshop (UAF) (August 21, 2015)

## Key Questions

The key questions asked at each workshop were:

1. What are the current (and best) practices for reaching farmers (including the use of ICT)?
2. How can we use the range of "delivery" options to make information more easily available?
3. How are farmers' needs and interests (or how should they be) identified and addressed?
4. How can we make sure information provided to farmers is:
  - a. needs-based
  - b. more compelling and "actionable"
  - c. credible
5. How can we enhance coordination between the different agricultural service providers who are helping meet farmer information needs?



## Student Engagement

Eight graduate students have been engaged at UAF – working with Dr. Babar Shahbaz. Areas of focus are:

1. Where do farmers get their farming information:
  - a. Village level communication channels,
  - b. Identification and Analysis of Effective Communication Pathways with Special Focus on ICTs for Agricultural Information Delivery: A Case Study of District Faisalabad
  - c. Social Media in Ag Extension in Pakistan (tentative title)
2. Information providers
  - a. Sources of information, and
  - b. Strategies of Public, Private and NGO sectors in delivering information (assessed against the “ASK ME” framework (Bell 2013), Appendix 4),
3. Knowledge resources, information portals and their credibility,
4. The apparent effectiveness of information delivery, and opportunities to improve current information delivery channels (especially in relation to the use of ICT).

Students with Dr. Aneela Afzal at AAUR are studying gender and the potential role of ICT to enhance women’s access to the agricultural information they need and want.

## Main Findings<sup>1</sup>

The consultations, workshops and studies identified a number of issues and associated opportunities to enhance the use of ICT in Ag Extension such that farmers have better access to credible, relevant and useful information (Table 1).

The findings are structured according to the “ASK ME” framework, where:

- A is for Audiences and their needs: who are they and what do they need?
- S is for Solutions: What is practical, credible and relevant to meet the needs?
- K is for Key message: What do people need to know to make the change?
- M is for Message form and delivery: How can the message best be packaged and delivered?
- E is for Evaluation: How can each step be improved? How can feedback be collected to independently assess success?

**Note:** These findings are in no way intended as a criticism of any partner. Typically there are very good reasons as to why needs and opportunities exist. It is by recognizing these needs and then analyzing them that we can identify the ways for enhanced services and progress.

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<sup>1</sup> These key findings were initially presented at the 2015 Annual AIP meeting in Islamabad (August 24-25).

**Table 1. Major observations and suggestions related to ICT and Agricultural Extension as identified through the consultation workshops and studies.**

<b>Element</b>	<b>Observation and/or suggestions</b>
<b>Audiences and their needs – Goal: understand farmers needs</b>	
How well are farmers' needs known?	Farmers' needs (including "location specific" information) are rarely analyzed. The needs of smallholders, women and youth are generally ignored.
<b>Solutions – Goal: provide credible, relevant information</b>	
What content exists to address farming problems?	There is a huge data bank of farming material on the internet and in print media (Public, private, NGOs). However, information is not always relevant, credible, reliable or easily available.
Where do those advising farmers get the information to package their recommendations?	<b>Public sector.</b> For the Punjab, the Research wing of the Department of Agriculture Punjab is the main source of knowledge to formulate recommendations for the public sector. <b>Private sector.</b> Senior company officials are the main source of knowledge.
What is the credibility of the advisory agents and the sources of farming information?	The credibility of some delivery agents is an issue. There is an opportunity and need to validate recommendations under farmers circumstances and in accordance with ecological needs. Ag Universities and Public sector organization have a role to play in ensuring materials/information is validated and relevant.
<b>Key message – Goal: understand what do people really need to know and hear?</b>	
Material packaging:	Material is often unclear in its message.
<b>Message form and delivery – Goal: Provide credible relevant information in a way that readily allows farmers to take positive action.</b>	
How aware are farmers of new technologies?	Awareness of new technologies is medium to high (e.g., for wheat, cotton, sugarcane, rice – farmers tend to know about improved practices such as land preparation, fertilizer and pesticide application, crop varieties and water management strategies). <b>Awareness, however, seems to be different from both 1) understanding how to implement an improved practice and/or 2) choosing to implement a practice.</b>
Where do farmers get their information?	In general though, farmers get information from a range of sources including: farmer meetings, individual contact with extension or input providers, banners, and advertisements in electronic and print media. Amongst these, fellow farmers is the most common source of information. Farmers regularly get pesticide and fertilizer information from dealers and pesticide companies. A few educated (mostly young) farmers use both print (e.g., Zarat Nama) and electronic media. It seems public extension service providers often target large landholders, high-income, progressive and educated farmers; presumably because such farmers have greater capacity to implement "new" practices. Smaller-scale farmers were generally more satisfied with private advisory services than the public sector (in part due to the focus of the public sector often seeming to be larger farmers). Adoption levels of recommendations are typically low with literacy a main factor limiting adoption.



Element	Observation and/or suggestions
What is the present role of ICT in information delivery?	<p>In the Punjab province, the public sector is the leading user of ICTs to deliver Ag information (e.g., online, mobile phone). However, there is little use of ICTs at the farm level to gather farming recommendations. In other provinces, there is little use of ICTs for extension materials. Directorates have websites but they mostly have institutional information (e.g., departments and staff etc.).</p> <p>A number of major private companies, some NGOs and agricultural universities (e.g., UAF) have online information portals in which information is available in English as well as Urdu languages.</p> <p>Initial studies have shown that the money earned from growing crops and grains are typically managed by male members of family, whereas money from selling eggs, milk, butter or clarified butter is managed by the females. The latter are typically sold in smaller quantities and are considered an additional source of revenue in the households. In terms of gender use of ICT, the general ranking was: TV &gt; Cell &gt; Radio &gt; Social networks &gt; Computer with wifi. There is no current indication however that females use these sources for collecting information on their farming practices.</p>
How might the role of ICT in information delivery be enhanced?	<p>ICT work should target extension workers and service providers strengthening skills and use. Further, ICT offers the opportunity to enhance coordination between service providers.</p> <p>Of the ICT options, Video continues to emerge as a very promising ICT format. While farmers and intermediaries (e.g., extension agents) likely use all media at some stage, the question (in one workshop) was “what ICT option to help the different groups?”. Delegates suggested:</p> <ul style="list-style-type: none"> <li>TV, Radio and cell phones may be best for farmers</li> <li>Video is good for both groups</li> <li>Internet and Social media may be best for intermediaries</li> </ul> <p>Mobile phone-based delivery could be more effective if combined both with other new (e.g., call centers) and traditional delivery (e.g., field demonstrations) methods.</p> <p>Work is needed to promote and raise awareness of the potential uses of ICTs at village level (e.g. village festivals, community centers).</p>
How well is material packaged?	Material is often not well presented. There is a need and opportunity to use more pictures, graphics and videos
<b>Evaluation</b>	
How well is feedback collected to independently assess success?	There is a need for monitoring and evaluation (M&E) to realistically assess present efforts - what works, what doesn't work, and ways forward. (Agricultural universities could be involved here.)
How well are Information intermediaries connected?	There is little coordination between stakeholders.

**Note.** Researchers found ASKME a simple and practical tool for the evaluation of extension services.

## Moving Forward



We outline two elements for moving ICT efforts forward:

1. A summary of the main elements raised through the workshop consultations with associated suggested actions, and
2. A set of recommendations for ICT in Ag Extension developed in response to questions from the Ministry of Information Technology and Telecom. (These recommendations are intended as a starting point for discussion and analysis.)

## Opportunities from the Consultations and Studies

The major points identified from the consultations and studies (Table 1 above) offer the platform for suggested next steps (Table 2). Thus potential activities were developed in relation to:

1. Coordination of ICT activities
2. Be demand driven - identify audiences and their needs (Workshops and Meetings).
3. Improve access to credible, relevant material (Workshops and Meetings).
4. Improve information packaging and development. (Workshops and Meetings).
5. Improve Information delivery. (Studies, Workshops and Meetings.)
6. Evaluate (Workshops and reviews).

**Table 2. Opportunities identified from consultations and studies and associated activities to enhance the application of ICT in Ag Extension in Pakistan**

Opportunity	Suggested Activities
<b>Improving coordination</b>	
<ul style="list-style-type: none"> <li>• There is little coordination between stakeholders</li> <li>• ICT offers the opportunity to enhance coordination between service providers</li> </ul>	<ul style="list-style-type: none"> <li>• <b>National Conference(s)</b> to harmonize current understanding of the present situation</li> <li>• <b>Continue consultation workshops</b> to identify mechanisms to enhance coordination and share lessons learned.</li> <li>• <b>Create a Database</b> of active ICT in Ag providers and their resource Apps or web sites</li> </ul>
<b>Audiences and their needs</b>	
<p><b>Farmers and family members</b></p> <ul style="list-style-type: none"> <li>• Farmers' needs (including "location specific" information) are rarely analyzed.</li> <li>• Smallholders, women and youth are generally ignored</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Raise awareness</b> amongst extension and information providers of the need to be demand-driven.</li> <li>• <b>Promote tools and skills</b> to help</li> </ul>

Opportunity	Suggested Activities
<p><b>Information intermediaries</b></p> <ul style="list-style-type: none"> <li>ICT work should start by targeting extension workers and service providers</li> </ul>	<p>identify audience needs and interests at the farm level.</p> <ul style="list-style-type: none"> <li><b>Build capacity</b> of extension service providers on ICTs (training can be provided through UC Davis &amp; Outreach chair of US-PCAS AFS)</li> </ul>
<b>Solutions</b>	
<p><b>Content - Need credible relevant information</b></p> <ul style="list-style-type: none"> <li>A huge data bank on the internet and in print media (Public, private, NGOs) exists</li> <li>However, information is not always relevant, credible (trustworthy) or reliable.</li> <li>The credibility of some delivery agent is also an issue.</li> <li>Ag Universities and Public sector organization have a role to play in ensuring materials/information is validated and relevant – e.g. Proven under farmers circumstances and in accordance with ecological needs</li> </ul>	<ul style="list-style-type: none"> <li><b>Coordinate</b> between those providing information and the delivery agents.</li> <li><b>Establish a mechanism</b> (possibly a portal) for wider access to credible technical information available from different sources</li> <li><b>Identify practices</b> and protocols to ensure information is demand-driven, available, validated, credible, relevant and trusted..</li> </ul>
<b>Key Message</b>	
<p><b>Material packaging</b></p>	<p><b>Information format.</b></p> <ul style="list-style-type: none"> <li>Conduct workshops and provide materials to ensure the information to be delivered focuses on the key information needed by the users.</li> </ul>
<b>Message form and delivery</b>	
<p><b>Material packaging</b></p> <ul style="list-style-type: none"> <li>Use pictures, graphics, videos</li> </ul>	<ul style="list-style-type: none"> <li><b>Conduct workshops</b> and provide materials to help make sure the key information is packaged to be interesting and actionable. Promote the appropriate use of pictures, graphics, voice, local language materials.</li> </ul>
<p><b>Delivery options</b></p> <ul style="list-style-type: none"> <li>Mobile phone based delivery can be more effective especially when</li> </ul>	<ul style="list-style-type: none"> <li><b>Identify communication pathways</b> and establish strategies to get the right information to the right people using</li> </ul>

<b>Opportunity</b>	<b>Suggested Activities</b>
<p>combined with and other new (e.g., call centers) and traditional delivery (e.g., field demonstrations) methods</p> <ul style="list-style-type: none"> <li>• Need work to better understand and promote the potential uses of ICTs at village level (e.g. village festivals, community centers)</li> </ul>	<p>traditional and ICT methods (e.g., integrate the use of cell phones with other mechanisms to better meet information needs such as considering call centers and village level access)</p> <ul style="list-style-type: none"> <li>• <b>Continue Gender and ICT work</b> (e.g., AAUR) to better identify ICT channels and needs to better meet female information needs.</li> <li>• <b>Build ICT capacity</b> among users and potential users.</li> <li>• <b>Share best practices</b> for identifying and validating information required, how to best use ICT and how to best develop materials for delivery.</li> </ul>
<b>Evaluation.</b>	
<p><b>Collecting feedback and independently assessing success</b></p> <ul style="list-style-type: none"> <li>• There is a need for M &amp; E to realistically assess present efforts. What works, what doesn't? Ways forward? Ag universities could/should take lead</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Develop strategies</b> for effective evaluation and identify ICT tools that can help with collecting feedback and field implementation data.</li> </ul>

## Ministry of IT Questions - Where are the Intervention Points?

When approached by the Ministry of Information Technology and Telecom to identify the “pressure points” for influencing and improving the use of ICT in Ag Extension, we developed Figure 1 (see below). In a broad sense, Figure 1 demonstrates the key elements to consider in building a successful system to use ICT to better provide farmers with the information they need. Those elements to consider are:



- 6) Appropriate policies and Infrastructure
- 7) Capable ICT users
- 8) Content that is needs-driven, credible and relevant
- 9) Delivery channels that get the information where it is needed, when it is needed and in an understandable form.
- 10) Feedback to improve each aspect of the system

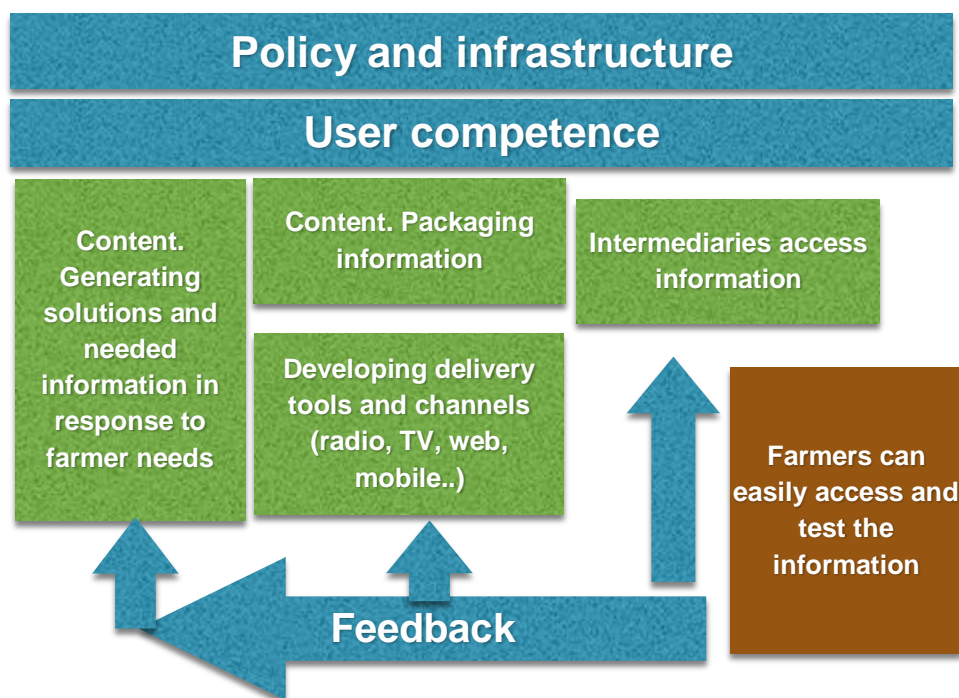


Figure 1. Major elements of ICT and extension

### Some key points

Before discussing the 5 elements listed above, it is important to highlight a few key points in relation to ICT in Ag Extension - namely:

- 1) IT is a tool - Credible relevant content that responds to the needs of farmers is the foundation for success.
- 2) Farm-level recommendations must be easily tested and have clear benefit. Such information must be consistent with supporting markets and profitability (which drive change at the farm level).
- 3) Trust in the message and trust in the messenger are both critical.
- 4) A variety of communication methods providing broad and easy access to information (and creating an “emotional connection”) is the best way to convince people of the need for change.

Bell (2015) in a recent review offers suggestions on how to strengthen ICT in Ag extension programs. (See the ICT evaluation checklist associated with the publication in Appendix 5). Now we consider the five elements of ICT and Extension.

## **1. Policy**

Discussions need to look at how policy can affect or is affecting key elements in the system, such as:

- infrastructure,
- incentives to access and use ICT, and
- the capacity of people to use ICT as both a tool to help deliver information to the information intermediaries and as a tool for users to access information.

## **2. User competence**

ICT competence must consider at least three potential ICT user groups:

1. Those packaging and generating the information (recommendations), the tools and the delivery systems
2. Those accessing the information to pass on to farmers, and
3. Finally (as appropriate) user capacity to use and access the tools developed

Each set of users may need slightly different skills.

## **3. Needs-driven, credible, relevant information**

It doesn't matter how good the delivery system is if the information being provided is not what the audience is interested in or wants. ICT needs to be considered in terms of its ability to help with both needs identification, and how it improves and makes access to information on solution easy.

The information delivered on recommendations needs to have many characteristics (e.g., low risk, compatible with the farming system, have a profitable market for produce produced), but in particular it must have 1) clear benefit and 2) be easy to test and implement. Finally the "solutions" or recommendations need to be validated under farmers' conditions considering their socio-economic opportunities and constraints.

#### **4. Delivery channels**

This is often where people actually start when applying ICT; doing so before having adequately considered the audience, their needs, and what is suitable for their specific situation. The chosen delivery channels (and we use the plural for “channels” on purpose) need to provide information such that the information is easily and readily available to their audience (whether it be the information intermediaries or the farmers). It is important to consider both ICT (e.g., radio, video, cell phone) and more traditional communication options (e.g., field demonstrations).

#### **5. Feedback and improvement**

ICT offers powerful ways to collect and geo-position feedback for the improvement of the message, the packaging of the message and how it is delivered and its impact.

In order to be successful, those using ICT to deliver information will benefit by asking key questions such as:

1. Who is the audience and what are their needs and interests?
2. What are the credible relevant options? (Consider profitability and markets)
3. How well is the information packaged to be 1) readily accessible and 2) easily understood and tested?
4. What are the best delivery options (in terms of trust and access) to reach the farmers considering:
  1. Infrastructure and access?
  2. Socio-cultural norms, and
  3. User competence?
5. How well is feedback collected to improve the message and its delivery options?
6. How does policy underpin and support infrastructure, access and use?

#### **Conclusions**

Pakistan is well placed to take advantage of ICT in helping farmers. However there are a number of steps required to make use of this potential. In particular, there is a need for:

1. Better coordination of ICT activities
2. Being demand driven and so better identifying audiences and their needs.
3. Ensuring information is both credible and relevant
4. Improving information packaging and development.
5. Improving methods of integrated information delivery.
6. Better evaluation of the whole process – the materials and how they are delivered and implemented.

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## Acknowledgements

Many people from a number of institutions have contributed to this paper. In particular, we acknowledge and appreciate the contributions and support of

- Dr. Muhammad Anjum Ali, D.G. Agriculture (Extension & A.R.), Government of the Punjab, Lahore
- Muhammad Rafiq Akhtar, Director Agricultural Information, Punjab.
- Dr. Zaheer-ud-Din Mirani, Sindh Agricultural University, Tando Jam, Sindh
- Ayesha Arif, UC Davis,
- Drs Aneela Afzal, AAUR
- Dr Badar Naseem, AAUR
- Prof. Dr. Asif Ali (then Director ORIC UAF, now V.C. MNSUA Multan)
- Extension staff of the Punjab, KPK, Sindh and Baluchistan

We appreciate the many people in the public, private and civil society sectors who contributed during the consultations and other information collecting activities.

## Appendix 1. ICT Options in Agricultural Extension.

Info sheet



ICT options in Ag

### Agricultural Innovation Program (AIP) for Pakistan

ICT can be used in a range of forms to support extension. The best use will likely involve integration across a range of options combined with traditional approaches (e.g., field demonstrations). Options in green (shaded) are considered the most promising.

Information communication technology and tools*					
Extension function	Radio	TV and videos	Cell phones (text, voice)	Feature and Smart devices	Computer + internet
<b>Identifying farmers' problems and opportunities – Who do they need and want?</b>					
Diagnose problems	Some potential if dealing with general problems, or if capacity for interaction and expertise available	Visuals are very helpful as "seeing is believing". Even better if combined with ways to receive feedback.	Some potential if farmers can call or text in and sufficient expertise is available.	Additional potential to a simple cell phone as it enables web or App access to special diagnostic tools.	Good comprehensive diagnostic tools are available
Collect information	Some potential if capacity for interaction		Can use for data collection.	Good for data collection with GPS.	Some potential if internet available.
<b>Promoting behavior change – What is practical and relevant to meet the needs?</b>					
Raise aware of general opportunities or needs ; convince farmers to try something new	Very good especially with persuasive programming	Visuals are usually very helpful as "seeing is believing"	Is an option if users are registered to receive such messages (SMS)	Is an option if users are registered to receive such messages (SMS, email)	Is an option if users are registered to receive such messages (SMS, email)
Provide specific information needed for change. what's involved and the benefits; demonstrate or train	Some potential – but limited information delivered. Can be enhanced with call in.	Good option as "seeing is believing"	Potential if farmers can call or text in and sufficient expertise is available	Additional potential to a simple cell phone as it enables web access and plays videos.	Good option for intermediaries to seek information and videos.
Facilitate access to credit and inputs			Mobile banking and negotiate directly with the suppliers	Mobile banking and negotiate directly with the suppliers	Online banking
Link farmers to markets	Good for providing general price reports		Access to price information (call in, subscription)	Can bring potential buyers and producers together; access price information	Can bring potential buyers and producers together; price info.
<b>Collect feedback – How can each step be improved?</b>					
Collect and respond to farmer feedback	Good if producers can call or text and sufficient expertise is available		Some potential if farmers can call or text in and sufficient expertise is available	Good option for intermediaries to seek information (if optimized for smart devices)	Good option for intermediaries to seek information
Assist with business planning	Some potential	Some potential		Simple farm management "Apps"; record keeping	farm management tools; record keeping

Prepared Mark Bell (UC Davis) and Judith Payne (USAID)  
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## Appendix 2. Initial Work Plan for e-Pak Ag (2014)

Elevator pitch. "Providing credible, relevant information to those helping farmers in Pakistan"

e-Pak Ag is a repository for project training and extension materials.

### **1. Review ICT and extension flow in the country**

This will be both a review of the literature plus identifying and meeting with key players in extension information packaging and dissemination in the country. Given the pluralistic nature of extension, the intent is to consult with the full range of players along the value chain who provide information to farmers. It is expected that the PARC, the provincial Directorates of information, key universities and select private sector players will be consulted across the life of the project.

The intent is to identify existing information flow channels and from that see how AIP - through e-Pak Ag - can complement and where opportunity presents add value to what exists.

### **2. Define goals for e-Pak Ag**

Through consultation with key AIP partners, the intent of e-Pak Ag will be refined as needed.

The starting goal of e-Pak Ag is to provide credible relevant information to those helping farmers in Afghanistan.

Further, e-Pak Ag aims to improve information access to alleviate major limitations of each of the major project commodities. The site complements the various existing national ICT resources.

### **3. Identify priority crops and priority need and opportunities**

While the project document outlines the primary starting points, e-Pak Ag will be a dynamic activity that adjusts in line with the core partners as they recognize and identify evolving needs and opportunities.

### **4. Collate existing materials**

A key element in such projects is to build on what exists- both within the projects and beyond. By not reinventing the wheel, valuable project resources can be better used to add value to what exist or to put energy into new materials. Both extension and relevant training materials will be considered. Quality assurance of material will be a key element of the project and so a vetting process will be established.

## **5. Establish draft site**

A draft website will be established based on the principle that the site will provide credible, relevant information to address key concerns within each of the mandated crops and commodities. The beauty of the web is that the site can evolve and shift as the project develops.

## **6. Promote site, conduct workshops**

Workshops will be held to 1) promote the site, 2) collect feedback on needs, opportunities and existing materials, and 3) promote best practices in the use of ICT in agricultural extension.

## **7. Collect feedback and improve both sites and materials**

Based on workshop feedback and on in-country consultations, the site and materials will be developed as needed. This will include modifying existing and identifying new materials to be developed.

## **8. National partners improving existing their own extension and training material sites complete with feedback mechanisms.**

One of the goals will be to help strengthen existing sites in terms of 1) the clarity of site use (who are the target audiences), 2) the ease of site use (can people easily and readily find the information they seek), and 3) the quality of the site materials (are they relevant, credible, concise and actionable). Overall to what extent can sites be made more attractive and useful to increase benefit to site users.

### Appendix 3. Agricultural web portals available in Pakistan (2015).

(Table from a study by Rafay Muzammil, UAF, 2015).

#### Public Sector

Organization	Type	Web Address	Service/Product	Mission and statement	Navigation*	Language
AARI (Ayub Agricultural Research Institute) Faisalabad	Govt.	www.aari.punjab.gov.pk	Input supply, advisory services, extension activity, research for up gradation of production technology	To evolve new varieties & to develop the technology for food safety, food security	A little tough	English but literature is available in urdu
Agri. Dept. Govt. of the Punjab	Govt.	www.agripunjab.gov.pk	Detailed production plan of all crops, info. about input supply, Help line, SMS service	Dissemination of appropriate technology to the farmer	Rather easy	English,
Agri. Dept. Govt. of Sindh	Govt.	http://sindhagri.gov.pk	Advisory services, Technical help, coordinate with input supplying organization	Not mentioned	Simple	English
Agricultural marketing information System AIMS	Govt.	http://www.amis.pk/	Establishing new markets and managing olds one, supervision of ramzan/Sunday bazar . Survey & online information about agri. commodities	Not mentioned	Easy	English and Urdu
BARI ( Barani Agriculture Research Institute)	Govt.	http://barichakwal.org/	Research about new innovation & products, Advisory services & training of farmers, tunnel farming, drip irrigation	ensure food security, rehabilitate the economically poor farmers of the rainfed area through advance technological approaches	Simple	English but literature in Urdu.
Directorate of agricultural marketing Sindh	Govt.	www.sindhagrmarketing.gov.pk	Market prices of agri. commodities district wise in, weather news, online complaints	Not mentioned		Uses Google translator with 80 to 90 languages including English and urdu

Fertilizer Prediction model (UAF)	Govt.	<a href="http://www.fertilizeruaf.pk/">http://www.fertilizeruaf.pk/</a>	Advisory services, info. about balance use of fertilizer, address of soil water testing labs in dist.	To provide the services at the door step of farmers regarding production technology & balance fertilizer use	Easy	English and Urdu
Fruit & Vegetable Development Project	Govt.	<a href="http://www.fvdp.gov.pk">www.fvdp.gov.pk</a>	Training for marketing, advisory services, data base, Germ plasma units, Canopy management,	Disease free and improved quality fruits and vegetables with value addition	Navigation is easy	Mostly English but some recommendations in Urdu
KissanDost	Govt.	<a href="http://www.kissandost.pk">www.kissandost.pk</a>	Advisory services, awareness through print and electronic media, give input and output analysis	guidance for each farmer of Punjab, for beneficial cropping pattern and its management technology suiting to his land and resources	Easy	English and Urdu
Livestock & Dairy development dept.	Govt.	<a href="http://www.livestockpunjab.gov.pk">www.livestockpunjab.gov.pk</a>	Toll free help line, Social media Campaign, sheep goat show, vaccination, Information desk, Supportive literature	Management of livestock, dairy and poultry farms and development of new genetic resources for livestock	Little bit tough, registration required for feed back	English,
Nuclear Institute for Agriculture and Biology	Govt.	<a href="http://www.niab.org.pk">www.niab.org.pk</a>	Market able products Cotton rice, lentil, Mungbean, chickpea, training course, technical services	Striving for agriculture development of Pakistan		English language
Pakistan Agricultural Research Council	Govt.	<a href="http://www.parc.gov.pk">www.parc.gov.pk</a>	Toll fee help line, Kissan corner, Agro. Forum, Database management, Research grants	Provision of science based solutions to agriculture of Pakistan through its statutory functions.	Rather easy	English and Urdu
Punjab Agriculture & Meat Company (PAMCO)	Govt.	<a href="http://www.pamco.bz">www.pamco.bz</a>	Advisory services, Technical help and Independent projects	Developing each District's own agro-economy		English but literature in Urdu

Punjab Seed Corporation	Govt.	<a href="http://psc.agripunjab.gov.pk/">http://psc.agripunjab.gov.pk/</a>	Seed production, processing and marketing, seed is the main product of PSC.	Not mentioned	Easy	English
Zarai Baithak (Cyber Extension)	Govt.	<a href="http://www.zaraibaithak.com">www.zaraibaithak.com</a>	Online Information desk, Expert opinion, Weather update	Training of trainer through Cyber Ext. Helping Farmers to Help Themselves	Very easy, registration required	English and Urdu
Zarai Taraqiati Bank Limited	Govt.	<a href="http://www.ztbl.com.pk">www.ztbl.com.pk</a>	Deposit schemes, loan schemes, Hajj applications, Locker facility, Home remittance, Cultivation Guides	To fulfill the needs of farming community, by delivering financial products and technical services	Very easy	English and Urdu

\* A somewhat subjective evaluation based on the initial sense of the ease of navigating and finding information of interest.

#### Private sector

Organization	Type	Web Address	Service/Product	Mission and statement	Navigation	Language
Ali Akbar Group	National	<a href="http://www.aliakbargroup.com">www.aliakbargroup.com</a>	Pesticides, seeds, micronutrients Selling + Advisory service, Apna Zarai Markaz & Target Zarai markaz	Enhancing quality of life for betterment of tomorrow		English but literature is available in urdu
Auriga Group	National	<a href="http://www.aurigagroup.com">www.aurigagroup.com</a>	Bio fertilizer, crop supplement, hybrid seeds, Research collaboration, advisory services	Vibrant rural economy driven by value-added agriculture.	Easy. Need to register for newsletter	English
Bayer crop science (Pakistan)	MN	<a href="http://www.bayercropscience.com.pk">www.bayercropscience.com.pk</a>	Insecticide, Herbicide, Fungicide and Seed treatment	Providing innovative products for the production of quality food, feed & fiber	A little bit difficult	English and Urdu
Engro Corp. Ltd.	National	<a href="http://www.engro.com">www.engro.com</a>	Milk, fertilizer, Advisory services to dairy farmers	To cater to local needs with products conforming to global standards.	Rather difficult	English,
Evyolgroup	MN	<a href="http://www.evyolgroup.com">www.evyolgroup.com</a>	Crop protection, seed, fertilizer, toll free services, weather update	Striving to meet the Customer needs for total value by introducing new technologies		English



Fatima Group	National	www.fatima-group.com	Fertilizer, Sugar industry, Energy Sector, Mining, Textile, Advisory services, Guiding literature. Extension services	To create continuous value for our customers through the highest levels of product quality and service.	Rather difficult	English and Urdu Total 91 languages.
FMC	MN	http://www.fmc.com	Crop protection include Pesticides, insecticides and technical services	Not mentioned		English
Four Brothers	National	www.4bgroup.com	Seeds, chemicals and tractors under one roof (Tarzan Markaz) Helpline, surveys, demonstration	To provide excellent quality and high productivity through advance technology and highly trained personal.	Difficult	English,
Jaffer Group	National	www.jaffer.com	Plant protection etc Use printed material and farmers' meetings	Not mentioned	A little bit difficult	English
Monsanto	MN	www.monsanto.com	Chemicals, seeds, Demonstration sites, farmers' meetings	Not mentioned		English
Nestle Pakistan	Multi-National (MN)	http://www.nestle.pk/	Milk, yogurt, Butter Advisory Services & Training	To be the leader in Nutrition Health and Wellness Good Food, Good Life,	Easy	English
Pak. Tobacco Company	National	www.ptc.com.pk	Tobacco, Advisory services in targeted areas & Trainings (contract extension)	Not mentioned	Simple	English
Pioneer Seed	MN DuPont	www.pioneer.com	Hybrid seeds, Advisory services, trainings , Weather update	Not mentioned		English, literature in Urdu
Syngenta	MN	www.syngenta.com	Insecticide, Herbicide, Fungicide and Seed treatment	Better food for a better world through outstanding crop solutions	Rather difficult	English
Sawat Agro. Chemicals	National	www.swatagro.com	Crop protection, micro nutrient and machines	To market innovative products that add value for farmers	Simple	English

## NGOs

Organization	Type	Web Address	Service/Product	Mission and statement	Navigation	Language
Agri. Hunt	NGO	www.agrihunt.com	Advisory services about crop production & protection, Agri. hunt blog, Career development of agri. graduates	to exchange opinions, experiences, good practices and resources related to e-agriculture	Rather easy, registration required	English and Urdu
Agribusiness Support Fund	NGO	http://www.asf.org.pk/	provides farmers demand-driven technical and managerial services improve their productivity, competitiveness and creditworthiness	To support economic growth, create employment opportunities and contribute to poverty alleviation through development of agriculture value chains	Very easy	English
Loksanjh	NGO	www.loksanjh.org	Networking and linkages with a wide range of institutions and individuals through seminars, workshops and exchange visits, E Shop, Live Loksanjh	envisioning an enlightened rural society where end beneficiaries may have choices to exercise and enjoy their rights, access to services without discrimination	Very easy	English
National Rural Support program	NGO	www.nrsp.org.pk	Micro-credit, Infrastructure development, Natural resource management and 'productive linkages	opportunities for income-generation, community schools, infrastructure schemes, improved agricultural productivity, and higher returns for labour	Very easy	English
Pakissan	NGO	www.pakissan.com	Advisory services about major crops, weather updates, input market situation	Connecting Agricultural Community for Better Farming	Very easy	English and Urdu
World Wide Fund for Nature	NGO	www.wwfpak.org	Information centers for sustainable use of resources, conservation work regarding biodiversity	To preserve genetic, species, and ecosystem diversity. To ensure the use of renewable natural resources and promote action to reduce pollution	A little bit difficult	English

## Appendix 4. “ASK ME” – A Framework For Extension Mark Bell (UC Davis)

The “ASK ME” framework for training design and delivery of Agriculture Extension and Education has 5 elements:

- A = Audience and Needs
- S = Solutions
- K = Key message
- M = Message form and delivery.
- E = Evaluation

The framework requires interaction, with evaluation throughout the entire process. Each element is defined below.

**A = Audience and Needs.** Assess the relevant needs and wants of the partners, target groups and stakeholders using methods such as: focus groups, participant observation, field visits, surveys, interviews, key informants, and intuition based on field experience.

**S = Solutions.** Identify solutions that are appropriate for the farmers socio-economic and market circumstances.

**K = Key Message.** Identify the ‘key message’ related to the solution(s) – those elements needed for successful implementation of a change (solution). Drafting an appropriate key message requires a clear understanding of the target audience.

**M = Message Form and Delivery:** Package and deliver your message. The key message is the basis for delivery through training, video, radio, fact sheets, field demonstrations, training events, etc. Training events require: Module Construction: Materials and Implementation leading to goals, Testing and validation, Redesigning as necessary, Production, Delivery/Presentation

**E = Evaluation.** Evaluate continually to learn and to improve the delivery (communication) process, the solution and to identify emerging needs. In training, evaluation includes Event evaluation, Pre-test/Post-test, Follow-up and Impact Evaluation.



## Appendix 5. Checklist For Assessing Your ICT In Ag Program.

Reference: Bell, M. 2015.

Information Communication Technology (ICT) has tremendous power to strengthen our Agricultural Extension efforts. However, many ICT efforts are unsuccessful as they neglect elements that help build success. Use “**AID**” (**A**wareness, **I**nterest, **D**oable) to evaluate your ICT program.



Major points involved*	Self-evaluation	Any actions required?
<b>Awareness. Do people easily know about your information?</b>		
Do you have clarity of your target audience?		
What range of communication channels are used to deliver your message, and how relevant are those channels to your audience(s)?		
<b>Interest. Do people want to learn more?</b>		
Evidence that the information is proven valid and addresses specific needs and interests of the audience		
How have you built linkages and trust (i.e., are you really a source of credible proven content)?		
How are you appealing at an aspirational (emotional) level?		
What mechanisms do you have to actively collect feedback, and how are you responding to emerging needs and audience responses to your information?		
<b>Doable. Can people easily try it?</b>		
Is there evidence that your information is easy to apply and has obvious benefit?		
Is there evidence that your information can be easily understood and tested?		

\* The above factors were identified after consultation with a number of leading ICT in Ag implementers.

**Reference:** Bell, M. 2015. ICT – Powering Behavior Change in Agricultural Extension. MEAS Brief. October 2015, U C, Davis. 19 pp.