



Report on the Status of ICT for Agricultural Extension in Bangladesh

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Bangladesh Institute of ICT in Development



AccessAgriculture



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Report on the Status of ICT for Agricultural Extension in Bangladesh

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Disclaimer

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Abbreviations

A2i	Access to Information
AIS	Agricultural Information Services
AICC	Agriculture Information and Communication Centres
BARC	Bangladesh Agricultural Research Council
BIID	Bangladesh Institute of ICT in Development
BRRRI	Bangladesh Rice Research Institute
CIC	Community Information Centers
CR	Community Radio
DAE	Department of Agricultural Extension
DAM	Department of Agricultural Marketing
DLS	Department of Livestock Services
DOF	Department of Fisheries
EPO	Extension Process Outsourcing
FIAC	Farmers' Information and Advice Centres
FICC	Fisheries Information and Communication Centres
GoB	Government of Bangladesh
GP	Grameen Phone
ICT	Information and Communication Technology
IVR	Interactive Voice Response
LGRD	Ministry for Local Government and Rural Development
MEAS	Modernizing Extension and Advisory Services, a USAID funded project
MOA	Ministry of Agriculture
NGO	Non-Governmental Organisation
NAEP	National Agricultural Extension Policy
NATP	National Agriculture Technology Program
PA	Practical Action
PMO	Prime Minister's Office
RDA	Rural Development Academy
SAU	Sher-E-Bangla Agricultural University
SRDI	Soil Resources Development Institute
SMS	Short Message Service
UISC	Union Parishad Information and Service Centres
UNDP	United Nations Development Program

Executive Summary

Opportunities

- **Digital Bangladesh as a visionary initiative from the Prime Minister's**
- **Leadership through Access to Information**
- **New national agricultural extension policy close to completion**
- **Enabling environment for mobile telephone network development (including data for internet access)**

Bangladesh is well positioned to effectively start using ICT for agricultural extension. Notably, the National Agricultural Extension Policy is currently under revision. Unlike the old one that dates back to 1996, in the new version e-agriculture has been added as one of the nine principles of the policy. The policy includes improving the Public Private Partnerships in extension, improving the research-extension-farmer linkage and developing a one-stop-shop approach with Farmers' Information and Advice Centres (FIAC), which should be based at every Union Parishad.

Furthermore, the Prime Minister's Office is spearheading the Digital Bangladesh concept, to link up each Union Parishad by internet to give better access to information and services.

Coverage by the mobile phone networks reaches 97% of the population. There are 98.3 million active phone lines. In rural areas the vast majority of phones are basic models with pre-paid scratch cards used to pay for airtime and the main feature used are voice calls. Mobile providers and banks are now rolling out "Mobile Money", which is expected to make a big difference in money flows from urban to rural and thus impact agricultural production as well.

Internet usage in Bangladesh is on the rise. From 2008 to 2011 internet usage per 100 people increased from 2.5 to 5. According to the Bangladesh Telecommunication Regulatory Commission (BTRC), total Internet usage as of July 2012 reached 29.4 million, and this done mainly through mobile based internet access. Bandwidth in Bangladesh is limited to one optical fibre cable of about 10GB/s but a new cable with 100GB/s is scheduled to be connected by 2014. Broadband connections are still rare outside of major urban areas. Rather, in rural areas the internet is accessed predominantly through USB modems connecting to the mobile phone network.

Much of the agricultural programming on national TV and Radio is prepared by a dedicated team in AIS. Recently AIS started to produce material for regional and community radio stations in local dialects. These are new initiatives and it is not yet possible to assess the impact.

The low literacy rate particularly among the rural population (72%, Source: CIA Website) is a major limitation for connecting directly with farmers using ICT text based solutions such as SMS or web-based written information. Organisations involved with ICT in extension are aware that text based solutions may best work through the use of educated intermediaries such as an extension worker. Direct contact with farmers may be more effective through either audio or visual means of communication.

The Ministry of Agriculture, through its Department of Agricultural Extension employs 13,000 such extension workers, there are around 2400 field officers for Department of Livestock. The task of these staff should be to make agricultural information more accessible to producers, but they do not have access to modern communication devices apart from their personal mobile phones or perhaps their own laptop computer. To the knowledge of the authors there is no plan to equip them with devices. However, they may benefit from the Digital Bangladesh provision of internet links to each Union Information Service Centre.

Some organisations are making inroads in using ICT. For example, the Ministry's own Soil Resources Development Institute provides accurate soil analysis data linked to GPS data online. From this, fertilization recommendations can be derived (by educated producers accessing the site directly or through call centre staff accessing the site on behalf of callers). This is potentially a very valuable service, but has not been widely advertised and marketed.

A big challenge is how to make information on production, marketing, nutrition, health, etc. accessible to rural women. Organizations like Katalyst and D-Net are addressing the need for women to obtain agricultural advice and also for other services. D Net started in the early 2000's with a door to door service on a mobile phone, which has now developed to a service with a laptop computer (pre-loaded with video, photos and other tips), printer, USB modem and health check kit. The person who provides this service is called an "InfoLady". Katalyst has been facilitating different initiatives like e-Krishok from private sector partners like BIID to reach women farmers in a sustainable approach.

One initiative which has made use of the physical access points, the i.e. information centres, and mobile phones to link farmers with quality advice is the e-Krishok (meaning "e-farmer") initiative of BIID and partners. The call centre can be reached by using a short code 16250. E-krishok helps with advice on disease identification and is now working with 350 GrameenPhone Community Information Centres. This can be expanded to include market information.

Another initiative which has been developed by BIID and Sher-E-Bangla Agricultural University is the eXtension.org.bd platform for agricultural extension. This will be a link between research and the field for use by extension staff, NGO's, policy makers etc. This will help all relevant stakeholders to aware about the recent developments in extension domain and share with wider audiences for feedback & comments. BIID will facilitate discussions more on availability of the existing contents (research findings), modality and tools of extension service rather than content, and special focus will be given on usage of ICT enabled media. All discussions will be made available in web and circulated through email list.

Rural Info is linked with WIN Incorporate offering an information service for the Mobile Phone Companies.

The Bangladesh Rice Knowledge Bank is an internet based agriculture knowledge repository. BRKB works closely with 15 Union Information and Service Centres. BRKB is mobilizing farmer feed-back on BRRI produced materials of BRKB to develop it further.

Practical Action Bangladesh is working on the Village Information Centre concept in 22 unions in the country. They are also working closely with AIS of MoA.

A daylong workshop organized on **ICT in Agriculture Extension** at Dhaka and all major stakeholders attended as well as contributed to map out all the on-going initiatives.

Overall the key issues considered were:

1. Who are the users of ICT in agriculture?
2. What type of information/ communication/service offered?
3. What technology media/tools are available at village level?
4. What do we need to do more for information availability?
5. How can we stimulate / create the demand for ICT enabled services?
6. What are major scopes to collaborate?

Introduction

ICT simply is the abbreviation for “information and communication technology”. While some associate only the internet or cell phone usage with ICT, the term really also encompasses traditional broadcasting tools such as radio and television. Communication happens through still or moving images, text, or voice. The devices that make these types of communication accessible are radios, television sets, various other sorts of video displays, stationary or portable computers, and cell phones from simple to smart.

While there is no standard definition for extension, one can simply say that “extension is getting knowledge to farmers so that they will make a positive change”. For extension to be successful it needs to include credible content, effective delivery, as well as be relevant (to the client) and applicable (i.e., the client needs to be able to act on the advice).

Clearly, ICT offer a means of delivery of agriculturally relevant content to rural areas. The enthusiasm surrounding ICT for extension stems from the expectation that information reach can become deeper and faster than ever before, reducing the need for costly personal interaction between farmers and intermediaries (extension staff, input suppliers, buyers, processors, etc.).

Nonetheless, for ICT enabled extension to be effective it will require a relationship of trust between client and messenger, good two-way communication (audience-centric, not sender-centric), continuity of effort, and the opportunity for the client to see or test the recommendation. Further, the process of change requires more than just increasing access to information such as technical knowledge. If there is no market for the agricultural product to be sold profitably, or if production does not otherwise improve the household’s livelihood, then the behaviour change does not benefit the client (G8 ICT Challenge Report, November 2012, <https://communities.usaidallnet.gov/ictforag/node/335>).

In Bangladesh, extension services are provided by the public sector (e.g., the Department of Agricultural Extension encompasses 13,000 staff¹), field staff funded donors and NGOs (like BRAC, DAM) through development projects, and to some extent by the private sector (corporate input suppliers, service providers like BIID through e-Krishok).

The key challenges for extension, not just in Bangladesh, are how to

- improve the linkage between research and extension,
- make research and extension more responsive to farmers’ needs and priorities and improve the linkage of farmers back to research and extension,
- provide more site technical/production information concerning more diversified production systems (plant, animal, fish based) for heterogeneous agro-ecological conditions,
- better integrate farmers into markets via the provision of market-related information (e.g., prices in various local and national markets, market quality requirements such as size, taste, colour, hygiene, etc.).

ICT interventions can be designed to specifically address these challenges (e.g., use ICTs to collect farmer input into research needs), but without improvements throughout the agricultural innovation system² in Bangladesh, the relevant information will simply not be available to be shared through ICT.

¹Source: IFPRI Worldwide Extension Study, 2011. www.worldwide-extension.org/asia/bangladesh. (Staff data is available only for DAE)

²More about Agricultural Innovation Systems: World Bank Agricultural Innovation Sourcebook:

The expansion of ICT in extension needs to meet at least three criteria in order to be successful:

1. *Cost Effectiveness* – The goal will be to increase the access to the greatest amount of information at the least possible cost. The recipient must also review initiatives already tried in other countries and examine questions of technology placement such as mobile technologies carried by extension agents or fixed locations as telecenters.
2. *User Friendliness* – The extension agents and farmers who will be the principal users of these technologies are not expected to be specialists in ICTs, but rather functional users of these technologies. The use of the Bangla language and high levels of illiteracy are issues to be considered as well.
3. *Adaptation to Local Conditions* – Constraints include poor availability of electricity, the danger of power surges, and the need for phone/internet network connectivity.

Policy Framework

Opportunities

- **Digital Bangladesh as a visionary initiative from the Prime Minister's**
- **Leadership through Access to Information**
- **New national agricultural extension policy close to completion**
- **Enabling environment for mobile telephone network development (including data for internet access)**

Ministry of Agriculture and the National Agricultural Extension Policy

The Government of Bangladesh is currently considering a new National Agricultural Extension Policy (NAEP2012, draft) to replace the one passed in 1996. The vision of the policy is to “*Encourage the various partners and agencies within the National Agricultural Extension System (NAES) to provide efficient and effective coordinated services which complement and reinforce each other, in an effort to increase the efficiency and productivity of agriculture in Bangladesh for ensuring food security and business development*”. (<http://www.dae.gov.bd/wp-content/uploads/2011/06/National-Agricultural-Extension-Policy-NAEP.pdf>) Mention is made of improving the Public Private Partnerships in extension, improving the research-extension-farmer linkage and developing a one-stop-shop approach at Farmers Information and Advice Centres (FIAC). FIACs shall be based in every Union Parishad. Clause 48 of the NAEP 2012 specifically focuses on **Innovative Improvements for e-Agriculture: Use of ICT for linking marketing system with production system will be implemented through web based and mobile based technologies. Digitized data bases and management information system will be set up at Upazilla, district and national level. Mobile based text messages and voice messages will be utilized for early warning on pest and disease outbreak, natural disasters as well as to disseminate critical information..** Digitized data bases and management information systems will be set up at Upazilla, district and national level. Mobile based text and voice messages will be sent out for early warning on pest and disease outbreak, natural disasters, as well as to disseminate critical information. Under this policy, the extension worker is to act as the “*Facilitator but not the doer*” without any mention of which ICT tools which may be made available to him/her.

<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTARD/0,,contentMDK:23129039~pagePK:148956~piPK:216618~theSitePK:336682,00.html>

Digital Bangladesh Under Vision 2021 and the A2i Project

The Digital Bangladesh under Vision 2021 is the mandate of the present government (as per their election manifesto) in which ICT has been recognized as the mainstream development tool to lift the economic and social status of the citizens of Bangladesh. It coincides with the implementation of the UNDP project titled Access to Information, A2i. For strategic reasons this project is now housed in Prime Minister's Office (PMO). A2i is facilitating to achieve the goals set under Digital Bangladesh mandate.

"The objective of the project is to increase transparency, improve governance, and reduce the time, difficulty and costs of obtaining government services for under-served communities of Bangladesh. This is to be achieved by: (1) strengthening existing e-services and launching a second generation of integrated, inter-operable e-government applications; (2) sensitizing government officials, training service providers and expanding digital literacy among the general public; (3) forging strong policy and strategy links to ensure implementation of needed legal and regulatory changes in support of the project and (4) promoting innovation in the delivery of e-services." www.a2i.pmo.gov.bd/index.php

The Digital Bangladesh initiative also addresses e-Agriculture specifically :*"E-Agriculture is an emerging field where Information and Communication technologies or ICTs (Radio, TV, Cell Phone, PDAs, PCs) are playing a vital and catalytic role in addressing key hindrances to the growth of Agriculture such as mismanagement of inputs, inaccessibility to rural finance, ineffective and inadequate extension service, lack of awareness about agro-processing, and insufficient preparedness for natural calamities, among others"*.(Page 76).The initiative envisages providing each Union Parishad with facilities that provide internet access to the population to improve linkage to information and Government services. These Union Parishad Information and Service Centres (UISCs) are shared access points setup as public-private partnerships. The first ones were set up in November 2011 and all 4,498 Union Parishads are supposed to have computers and internet connections.

Within the A2i project there is a mention of coordinating the enhancement of the national content repository with a particular focus on education and livelihood-related information (including Health and Agriculture).

National ICT Infrastructure, Accessibility of Devices and Cost of Use

Opportunities

- National agricultural radio programs are well established
- New community radio stations are being developed
- State television broadcasts agricultural programming six times per week
- Commercial Channel-i has a popular weekly agricultural Show and daily agricultural news
- 97% of population has mobile phone coverage
- 100 million mobile phone connections
- More than 10 million internet connections (mainly through mobile data connection)
- Two types of information centers are being established at Union Parishad level nationwide (public or public private partnerships)
- Other rural information centers such as Grameenphone Community Information Centers exist as well (entrepreneurial)

Broadcasting System

Radio and television broadcasting are mass communication tools that are being used in many parts of the world to disseminate agricultural information. In Bangladesh it is the government run Bangladesh

Television that provides daily agricultural programming via the national channel and regional stations. Channel-i is a commercial TV Channel with prominent, regular agricultural programs (Rhidoeye Mati o Manush on Sundays, and Krishi News six times a week in the evening).

The popularity of urban, private FM radio stations is on the rise, especially among the youth. Private radio channels are not accessible country-wide; especially not in rural communities. The public radio, Bangladesh Betar, has the largest network and this does cover the whole country. It broadcasts programs on diverse issues such as health and nutrition, education, children and women rights. It also has some regional programs.

In recent years 15 community radio stations, operated by volunteers, have been added. All the community radios cover agriculture related news but it is only Krishi Radio of Agricultural Information Services (AIS) unit of the Ministry of Agriculture that provides extensive agriculture content.

In fact, much of the agricultural programming on national TV and Radio is prepared by a dedicated team in AIS. Recently AIS started to produce material for regional and community radio stations in local dialects. The content focuses on tips for better crop management. Since these are new initiative, it is not possible to assess the impact yet. AIS is also establishing its own Community Radio Station in Amtali in West Bangladesh with the slogan "My Radio, My Voice".(It is yet to be demonstrated that they are indeed giving a voice to the voiceless.)

Listening to the radio and collectively watching television, e.g., at the tea stalls, is a well-established tradition in rural Bangladesh. Normally the most watched programs are entertainment films and series plus sport (especially cricket).In different locations radio can be effective, but it depends upon whether farmers are in the habit of listening to specific programs.

Mobile Phones and Cellular Access

Coverage by the mobile phone networks reaches 97% of the population. There are 97.18 million active phone lines (Source: www.btrc.gov.bd).In rural areas the vast majority of phones are basic models with pre-paid scratch cards used to pay for airtime. The main feature used is voice calls. Mobile providers and banks are now rolling out "Mobile Money", which is expected to make a big difference in money flows from urban to rural and thus impact agricultural production as well.

Internet Infrastructure and Access

Internet usage in Bangladesh is on the rise. From 2008 to 2011 internet usage per 100 people increased from 2.5 to 5³. According to the Bangladesh Telecommunication Regulatory Commission (BTRC), total Internet usage as of July 2012 reached 29.4 million, and this done mainly through mobile based internet access. Bandwidth in Bangladesh is limited to one optical fibre cable of about 10GB/s but a new cable with 100GB/s is scheduled to be connected by 2014. Broadband connections are still rare outside of major urban areas. In rural areas the internet is accessed predominantly through USB modems. Such modems can be purchased for 1,000 and 1,500 Taka (\$12-18).All of the main phone providers sell them. Most are slow (2G or Edge), but the government owned 'Tele-Talk' network already offers 3G connections.

The growth of mobile internet access, as reported by Grameenphone, is that they had 9.8 million GPRS/EDGE mobile internet users by the end of September 2012, up by around 1 million in three months, and up from 3.4 million just twelve months earlier. This implies an impressive year-on-year net increase of 6.4 million. The company claims it was helped by specific promotions aimed at the youth

³Source : <http://data.worldbank.org/indicator/IT.NET.USER.P2>

market, as well as government partnerships including the distribution of wireless modems in schools across the country. Total Internet user reached 29.42 Million as on July 2012 and 27.79 million use mobile phone for accessing internet (Source : www.btrc.gov.bd).

In rural communities there are three different types of physical information centres which may, over time, also provide access to the internet:

- Union Information Service Centres (UISC) in each Union Parishad. They are the responsibility of the Ministry for Local Government and Rural Development (LGRD) and intended to be operated as Public Private Partnerships. So far there are 4502 such UISCs within total 4498 Union Parishads. More and more computers are being distributed and operators are being trained. The building and some basic equipment are funded by the public sector, but revenue and thus income for the centre's operators (usually a woman and a man) is to be generated through the provision of services such as information about various government services, application forms, health, family planning and agriculture information. The information is free but a fee is charged for management and printing. The Access 2 Information (A2i) project together with LGRD is trying to ensure uninterrupted supply of electricity in the Union Centres. Different organizations like BRRI, BIID etc. are working jointly with A2I to use the UISC network for their service delivery.
- Agriculture Information and Communication Centre (AICC) is an initiative of AIS, Ministry of Agriculture. They, too, based in every Union Parishad and some are at based at the Farmers Field Schools. So far there are 150 AICC in operation at field level. The AICC do not have an underlying model for revenue generation.
- Private sector initiatives operated either by NGOs or entrepreneurs. Examples of the latter are Community Information Centres run by Grameenphone and the Batighar centers run by BIID.

Each of these approaches requires the client/farmer to travel to visit the centre to use the service, or for an intermediary to do so on his/her behalf.

An alternative model is that of the InfoLadies, who bring information literally to the doorstep of predominantly female clients. The InfoLadies carry simple handheld net book computers which are preloaded with information or which can link to the internet through a modem.

Synergistic Opportunities

With a growing user base in cellular phone and internet sectors, service providers are introducing value added services, which are commercially as well as socially viable. Mobile based health and educational help-line options are fast becoming popular among millions in both rural and urban settings. For example, even a mobile based functional English learning service (BBC Janala) has been launched with interactive teaching options.

Private entities are also actively exploring synergistic opportunities between mobile telephony, Internet and "info-mediaries" (field workers with focus on information services). In rural areas, more people are showing willingness to use agriculture and health related information services. Phone in options and Short Message Service (SMS) are now widely used by mainstream TV and radio stations to obtain viewers'/listeners' opinion on a wide variety of issues. All mobile phone service providers are providing consultation service with doctors. Both live consultations with doctors and Interactive Voice Response (IVR) services are being offered to the people. The Upazilla Health Complexes are equipped with mobile phones where people can consult with the doctor on-duty.

Literacy Issues

One of the main limitations for connecting directly with farmers using ICT text based solutions such as SMS or web-based information is the generally low literacy rate. Recent literacy survey figures show rates of 72% in rural areas (CIA website). Other estimates put literacy at 40% or lower. Organisations involved with ICT in extension are aware that text based solutions can only work with an intermediary such as an extension worker whereas the preference for direct contact with farmers is either audio or visual communication.

Assessment of Existing Printed and Web-based Material for Extension and for Farmers Directly

- **Much of the material available is only of use by Extension Staff or other intermediaries**
- **Phoning a short code Call Center is an option for most farmers with access to a mobile phone**
- **SMS information is only of use to those who can read**
- **Many public, private sector and NGO initiatives have worked on a pilot scale, but most still have to scale up**

In Bangladesh the usage of ICT enabled services in agriculture evolved during last 10 to 12 years and followed traditional trends, starting from mass media, fixed telephony, mobile and finally through internet. The recent revolution in ICT industry, specially, due to massive penetration of mobile phone and digital Bangladesh initiative contributed significantly to trigger the changes in extension service. Private sector (Telecom operators) contributed in a big way to take the connectivity issue forward and NGOs play an important role to explore innovative ideas to introduce ICT enabled extension services, primarily focusing on information component only through offline media like CD. Government organizations started using ICT media rather late with most of the initiatives being started after 2008 when the Digital Bangladesh campaign was launched.

Previously, extension materials such as IRRI fact sheets were initially produced in the English language and mostly were meant for researchers and extension agents. Later all contents of fact sheet were translated into Bengali. IRRI at the moment is seriously reviewing its materials in the Rice Knowledge Bank and looking for more extension and farmer friendly materials. It is also closely working with its national partners to be able to develop national portals on rice and agriculture. A new team is working to make the materials more practical and user friendly. It has to go long way in terms moving from a project approach to a more sustainable approach to be able to enrich national system with multiple partners beyond its formal approach of working alone with the NARES systems.

Even when material has been produced for farmers in the Bangla language there has been a big emphasis on text based material. Using photographs or illustrations may prove more suitable.

Brief Profiles of the Key Players for Agricultural Extension and ICT in Bangladesh

Name	Contact Information	Brief
Ministry of Agriculture (MOA)	Minister: Ms Matia Chowdhury, MP. www.moa.gov.bd/index.htm , Phone:880-2-7169277/ 880-2-8333200 Email: minister@moa.gov.bd	Within the MOA, extension related work is carried out by the Department of Agricultural Extension (DAE), Agriculture Information Service (AIS), and Department of Agricultural Marketing (DAM).
Department of Agricultural Extension (DAE)	www.dae.gov.bd Director General: Kbd. Mukul Chandra Roy Phone: 880-2-9140857 Email: dgdae@dae.gov.bd	DAE is responsible for 13,000 Extension workers throughout the country and is in charge of 14 Agricultural Training Institutes. The Central Extension Resources Development Institute is being relaunched as the National Agricultural Training Academy. DAE runs a number of Horticulture Centres and Plant Quarantine Centres. The extension staff should be able to use facilities at the Farmers Information and Advice Centres being established in each Union Parishad. So far, staff link with farmers through many different initiatives, but do not tend to use ICTs in their work. A challenge is that of linking with rural women involved in agriculture as only 7% of the extension staff is female.
Agricultural Information Service (AIS)	www.ais.gov.bd Phone: 880-2-9112260 Email: dirais@dekko.net.bd	Although relatively small, the production team at AIS is very dedicated. The website has a large number of resources of use to farmers and extension workers, and all is published in the Bangla language. Digital cameras and editing equipment are of a high standard. AIS provides material for the agricultural programs on state TV and radio at the national and regional basis. AIS is also responsible for providing agricultural content for the new community radio stations. Production of local programming in regional dialects is now being encouraged. Agricultural radio programs have been produced since 1939. In radio they now have a total of 12 hours per day. The most popular is the daily "My Country – My Soil". AIS produces a 30-minute program for national TV that is broadcast 6 days per week. AIS has also worked on a number of short multi-media products, a total of now 150 clips. Every three months AIS has a meeting to decide on subjects to be covered in future programs. AIS even offers an SMS service, which currently has 35,000 subscribers. Around 150 Agricultural Information and Communication Centres (AICC) are run by AIS and they are linked with Practical Action to run an Agricultural Call Centre through a long code which is

Name	Contact Information	Brief
		09633123123
Department of Agricultural Marketing (DAM)	www.dam.gov.bd Chief (Research, Planning & Development): Md. Shafiqur Rahman Shaikh Phone: 02-9114093, 01731928006, 880-2-9114310 Email: chief@dam.gov.bd	DAM, which is part of the MOA, has undertaken an e-government initiative to utilize the power of ICT to develop and disseminate critical agricultural market information to farmers, traders, government, policy makers, development agencies and other stakeholders. Under the overall coordination and support of the Government's Support to ICT Task Force , DAM has developed the first phase of its programme to automate data entry at the district level where market information of agricultural products is collected from local markets. The initiative also attempts at developing the capacity of the DAM head office in Dhaka to consolidate and coordinate dissemination of the information to government, farmers, and other stakeholders. The daily price information is available for use in many ways including from the DAM website.
National Agriculture Technology Program (NATP)	www.worldbank.org/projects/P084078/national-agricultural-technology-project?lang=en	<p>Since 2008 the MOA has been implementing the World Bank funded National Agricultural Technology Program. Agricultural extension support is one of the four project components; the others are support to agricultural research, supply chain development, and project management and coordination. NATP will be contribute to the national objective of increasing income and reducing extreme poverty and hunger by improving agricultural productivity and performance of the national agricultural technology system.</p> <p>The overall objective of the longer term program (NATP in three phases over 15 years) is to support the GOB's strategy to improve national agricultural productivity and farm income, with a particular focus on small and marginal farmers. The development objective of the phase 1 of the NATP is to improve effectiveness of the national agricultural technology system in Bangladesh.</p> <p>The project development objective will be achieved by increasing efficiency and effectiveness of agricultural research and extension systems, and by strengthening farmer market linkages. More specifically, the national agricultural technology system would be enabled to support:</p> <ul style="list-style-type: none"> • High priority, pluralistic, participatory and demand-led agricultural research; Decentralized, participatory, demand-led and knowledge-based approach for agricultural extension; • Improved post-harvest technology and management practices for high value agriculture by promoting farmer-market linkages as part of the development of selected supply chains; • Agreed reforms for the agricultural research and extension systems, increased public

Name	Contact Information	Brief
		funding for the systems and promote effective use of such resources, and promote public-private partnership in research, extension and supply chain development.
Bangladesh Agricultural Research Council (BARC)	www.barc.gov.bd Email: barc@bdmail.net Executive Chairman: Mr Wais Kabir Phone: 9135587, 9014975, 01715133485 Email: ec-barc@barc.gov.bd	BARC is the official National Agricultural Research centre for Bangladesh with an emphasis on research for improving agriculture. BARC maintains large databases of both spatial and non-spatial information. Goals of the organization are to generate client-oriented or demand-driven appropriate technology, document and disseminate research outputs to stakeholders.
Bangladesh Rice Research Institute (BRI)	www.bri.gov.bd Director General: Phone: (880-2-9252736; 9257401-05. Email: dg@bri.gov.bd	In terms of digital platforms, BRI is responsible for the Bangladesh Rice Knowledge Bank, BRKB, www.knowledgebank-bri.org . BRI also works closely with 15 Union Information Centres operated by the Ministry for Local Government and Rural Development. In these info centres BRKB material is available in both digital and hard copy. Farmer feed-back is actively solicited to further improve the BRI produced materials. The BRKB repository complements that of the international IRRI Rice Knowledge Bank www.knowledgebank.irri.org .
Soil Resources Development Institute (SRDI)	www.srdi.gov.bd Phone: 880-2-9113363 Email: director@srdi.gov.bd Md. Moqbul Hossain Phone: 01710257841 Email: moqbul_h@yahoo.com	SRDI developed the Fertilizer Recommendation Software in partnership with Katalyst and IFDC to assist farmers with the accurate information for different crops based on location and soil type. This links very quickly to a soil and land use database to give the correct information to the farmer. Most of the time farmers use either the Grameenphone Community Information Centres or the Banglalink short code 7676 to reach the service. Farmers can get the information they require within three minutes. It is a potentially very valuable service which is underused at present and would probably benefit from more intensive publicity and marketing efforts.
Ministry of Fisheries and Livestock Department of Livestock Services (DLS)	E-Livestock, www.dls.gov.bd/e_Livestock/Gobadi_Pashur_rog.php Director General: Md. Ashraf Ali Phone: 88-02-8112983, 8115532	DLS employs around 2,400 extension staff throughout the country. They are responsible for disease surveillance and advice on animal husbandry.

Name	Contact Information	Brief
	Email: ashrafdls@yahoo.com www.dls.gov.bd	
Department of Fisheries (DOF)	www.fisheries.gov.bd Fish Advice, www.fishadvice.gov.bd/fishadvice	The DOF promoting ICT enabled services as a part of the ongoing Digital Bangladesh initiative of the government. It is making strides to link with Digital Bangladesh and e-Extension systems.
Access to Information (A2i), UNDP	www.a2i.pmo.gov.bd/index.php?option=com_content&task=view&id=481&Itemid=468	A2i is the flagship initiative of the United Nations Development Program in Bangladesh. Under this project, the UNDP is facilitating the implementation of the Digital Bangladesh vision of the government. A2i is hosted by the Prime Minister's Office. Its mandate is to make policy interventions and initiate e-governance related activities at different level of the government. A2i is supporting the establishment of shared access point setup under public-private partnerships, namely the Union Information and Service Centres (UISC). UISC offer both commercial and citizen services. Over time, all 4,498 union parishads will be provided with computers and internet connections.
Rural Development Academy (RDA), Bogra	www.rda.gov.bd Phone: 880-51-51001/ 78602-101 Email: dgrda.bogra@yahoo.com	RDA has produced practical training videos on rice seed sorting and storage. Women to women extension. Worked with women's NGO – TMSS
D-Net	www.dnet.org.bd Phone: +88 02 9131424,+88 02 8124976,+88 01814 652496, Email: info@dnet.org.bd Executive Director: Dr. Ananya Raihan Phone: 01196 022591 Email: ananya@dnet.org.bd	D-Net with their partner Manusher Janno Foundation and with funding from DFID has introduced a concept of InfoLady with 10at starting stage and now 60 in 19 districts, which they intend to roll out to 12,000 throughout the country. D-Net recognised the problem for women needing agricultural advice, but also for health and other services. They intend to scale up by linking with a bank to offer start up loans to potential InfoLadies, with the aim of having 3 working in each Union Parishad. The model works by visiting women at the homes and charging for services provided. Other developments include InfoLadies acting as Group Co-ordinators so that many more people can use the services in one session. D-Net has also set up an agricultural marketing company called Fair Price International. This intends to work with farmers to buy produce and transport it from villages. They are also looking at the possibility of encouraging organic production and marketing the produce. In order to pay for the expansion they are fundraising with Non Resident Bangladeshis in North

Name	Contact Information	Brief
Bangladesh Institute of ICT in Development (BIID)	www.biid.org.bd CEO: Md Shahid Uddin Akbar Phone: +8801819243935 Email: shahid.akbar@biid.org.bd	America and Europe and hope to link with a major corporate sponsor. BIID is a Bangladesh based private, for profit company. BIID is a distinct inclusive business initiative to support development and promotion of Information and Communication Technology (ICT) based services. The inclusive approach ensures serving the poor in a sustainable way through market led approach. The distinction of BIID lies in clear identification of ICT as a cross cutting development tools and create opportunities through continuous knowledge management, innovation and development.
BIID e-Krishok	www.ekrishok.com	BIID's agricultural service is branded as e-Krishok, an initiative which is aimed at farmers with the desired goal of providing services from which farmers will benefit both in terms of their farming activities and opening up opportunities in new avenues which will ultimately translate into increased income for farmers. Farmers with any problem or query or issue which is related to agriculture can go to nearby ICT enabled Information Centre / Telecentres and receive the information that they are seeking. The information usually provided to them in a timely and quick manner, so that the farmers can get on with their activities. With such timely and appropriate information, farmers will be able to maximize their economic gain; enabling them to achieve income growth through agricultural activities. e-Krishok is now in a process of transforming into a transactional service through introducing short code 16250. Under this short code, SMS and voice based information and advisory services will be offered.

Name	Contact Information	Brief
BIID Market Linkage Program	www.biid.org.bd CEO: Md Shahid Uddin Akbar Phone: +8801819243935 Email: shahid.akbar@biid.org.bd	BIID is partnering with Grameen Phone to work as Aggregator for their Market Linkage Program which aims to connect the farmers to the markets through an online platform. Under this initiative, farmers will be educated on quality issues and allowed to post their produces in the portal & make transactions. Private sector partners are also involved in this process and other value chain actors will also cover through this initiative.
BIID Extension Process Outsourcing (EPO)	www.biid.org.bd CEO: Md Shahid Uddin Akbar Phone: +8801819243935 Email: shahid.akbar@biid.org.bd	EPO is a new initiative of BIID to offer end-to-end solution for extension services. Integration of ICT enabled services are core of this and organizations can be benefitted through proper farmer database and managing field with informed decision. This has been specially designed for both public and private sector organizations who are involved in extension related activities. EPO will also facilitate service providers (Specially the input suppliers) to reach directly to the farmer's which is not available now.
BIID eXtension	www.extension.org.bd	BIID and Sher-E-Bangla Agricultural University (SAU) jointly launched the www.extension.org.bd portal to establish an ICT based knowledge sharing platform for various stakeholders of agricultural extension. This online platform will foster usage of ICT in agricultural extension to faster growth in the agriculture sector through knowledge sharing, consequently enhancing the efficiency of knowledge & skill of expertise on continuous basis of relevant stakeholders including researchers, extension officers, academicians, policy makers, private sectors, media, development agencies, NGOs etc. Instrumentally, it will coordinate among these stakeholders and link the research to field, provide relevant and updated extension related information to the people on a more regular basis. BIID foresee this platform as a knowledge hub for policy makers, academician and extension workers.
Katalyst		Katalyst is a leading donor consortium project with market development approach. funded by DFID, CIDA, SDC and Royal Dutch Embassy. Increase the competitiveness of SME's through facilitation is the goal of Katalyst where income and employment are the major indicators of growth. In addition to many other projects, Katalyst supported a no. of private sector led ICT based initiatives in Bangladesh, partners include major telecom operators (GP, Banglalink for call centre), BIID for e-Krishok, Win Incorporate for 7676 and government institutes like AIS, SRDI (For Fertilizer Recommendation Software), etc.

Name	Contact Information	Brief
Practical Action (PA)		<p>Practical Action is a UK based NGO with focus on technology transfer type of projects.</p> <p>In Bangladesh, PA has developed a number of ICT enabled contents mainly on agro processing and non-farm activities. PA was involved in establishing Rural Technology Centre to offer value added services for the local communities, including farmers. They distributed CD's through their Rural Technology Centres (now not in operation) and partner organizations. PA is currently working with AIS to establish a call centre to serve the farmers.</p>
Win Incorporate	<p>www.ruralinfobd.com CEO: Dr. Kashfia Ahmed</p>	<p>Win Incorporate is a private company with focus on agriculture related projects.</p> <p>Win Incorporate offers ICT enabled (web and mobile) based content services to Grameen Phone and Banglalink. Initially, Katalyst supported the launching of these services.</p>
<p>Grameen Phone (GP) and their Community Information Centers (CIC)</p>	<p>www.gpcic.org In charge of Agriculture and the GP Community Information Centres: Reaz-us Sultan. Phone: 01711505613 Email: reaz@grameenphone.com</p>	<p>GP is a private, leading mobile service provider with 40.02 million (Source: www.btrc.gov.bd) customer base covering 41% of market share.</p> <p>The pilot project started with 16 Community Information Centres (CICs) in February 2006, and has by now become a massive operation with over 500 CICs running in around 450 Upazillas. The immediate term plan of this initiative is to establish CICs in all the 462 Upazillas. In the long run GP plans to increase the number of CICs substantially so that every CIC can support the information needs of four adjacent villages. GP's CICs are designed to be run independently as small businesses by local entrepreneurs. The entrepreneurs are trained and are provided with continuous support by GP. To help the entrepreneurs earn more, CIC also provide local people with other GP services, such as payphones (again using GPs mobile network) and electronic recharges (Flexi load) for pre-paid and post-paid mobile accounts.</p> <p>This initiative by GP is part of its long term commitment to the community including: Bridging the digital divide by providing information access to rural people, alleviating poverty, educating the underserved and underprivileged on information-based services, create employment for unemployed youth.</p> <p>BIID offers its e-Krishok services to farmers through 350 of the GP CICs.</p>

Name	Contact Information	Brief
Banglalink 7676	www.banglalinkgsm.com/docs.php?id=16	<p>Banglalink is the 2nd largest mobile service provider with 25.83 million (Source: www.btrc.gov.bd) customer base covering 27% of market share.</p> <p>In 2008 Banglalink introduced a service called “krishijigya 7676”. By dialing the short code 7676, a Banglalink customer reaches a call centre, where staff provide answers and suggestions to queries related to agriculture, vegetable and fruit farming, poultry, livestock, fisheries, etc. To use this service a just needs to dial 7676, talk and get expert’s advice on the problem. Banglalink was the pioneer in launching such a service in Bangladesh.</p>
Gram web		<p>Grameen Communications, a sister concern of Grameen Bank, in conjunction with Keyushu University, Japan, is supporting local communities to develop their own information hubs through developing online portals as well as direct information service over mail and phone (mobile).</p>
Cell Bazaar	www.cellbazaar.com/web	<p>An online platform to facilitate buy and sale of wide range of products of the GP subscribers only. The service is also available in mobile phone. Agriculture produces are also available in this platform.</p>
Channel-I, Private TV Channel	<p>www.channel-i-tv.com Chairperson: Shykh Siraj Phone: +88-02-8891160-65</p>	<p>Channel I’s agricultural program is called “Ridoye Mati O Manush” and has been broadcast weekly program every Sunday since 2003. The channels also provides a daily agricultural news bulletin at 5 pm each day. Other programs initiated by Channel-i include games shows for rural people, introducing college students to rural life, and discussion forum in which farmers challenge the Government in the weeks before the National Budget is set.</p>

Key Findings from the ICT for Extension Workshop

On December 3, 2012, the MEAS team⁴ hosted a workshop on ICT for extension at Rigs Inn, Dhaka.

The lively discussions resulted in the identification of the **key factors** that are necessary for the utilization of ICT for extension to be **successful**:

- The information that is communicated must be timely, reliable, and available at low cost.
- The potential users must be aware of the ICT tools available to them. It is not sufficient to design a tool, it must also be promoted.
- The ICT infrastructure must be inclusive, meaning that even poor farmers and those in remote parts of the country must have access to it.
- The provision of the ICT services must be based on solid needs assessments.
- The literacy level of the clients must be taken into account.
- The various players in the ICT sector must be networked and collaborate well.
- Available technologies should be used. Avoid duplication of effort.
- The backbone of the ICT has to be based on good knowledge management and strong linkages between research and extension (the intermediary).
- A clear strategy should be pursued (targeted information, message, and format), taking into account whether the immediate client is the farmer or an intermediary.
- There must be incentives for the farmer or intermediary to use the tool.
- There must be incentives for the provider of the information to make that information available in a format, etc. that is suited to the user. Consider sustainable funding/revenue models.
- The client must have confidence in the message and the messenger (intermediary, tool).
- The message(s) and delivery technology must be adapted to local conditions.
- Also consider using community radio, folk songs, and theatrical productions, if popular in the target region.

In Bangladesh, particular **challenges** are associated with

- securing of government resources, uncertainty about long term commitment (sustainability);
- difficulties for the private sector to establish sustainable (financially sound) business model for provision of ICT services to agricultural sector;
- coordinating or integrating different information sources and actors (public, private, NGO);
- continuously updating and ensuring high quality, validated content;
- improving the motivation of staff towards ICT, improving their access, and training them in the utilization of ICT and creation of content;

⁴The MEAS team consists of Shahid Akbar of BIID, Andrea Bohn from the University of Illinois at Urbana Champaign, Mark Bell from the University of California at Davis, and Phil Malone of Access Agriculture. See Annex B for the list of participants at the workshop and Annex C for background information on this USAID funded project.

- reliable internet access, reliable electric power;
- addressing challenges of literacy, language and format;
- achieving relevance for (all) farmers and addressing gender equity;
- lack of direct communication with the farmers, and too little effort of obtaining systematic feedback from the farmers.

From these findings, five questions emerged as particularly relevant for improving the utilization of ICT for extension in Bangladesh:

1. Where and how can farmers or those who serve them as intermediaries (extension staff) access credible information?

The participants rated the information made available by AIS, SRDI, BARC, BRRI, and other public research institutions in Bangladesh as generally credible but probably not sufficient. Most of the service providers in extension depend on the government sources and private sector for reliable & latest information. The major limitations of the existing information platforms has multi dimension which includes lack of regular update, only text based (no animation or video) and readiness in digital format as well as quality. Specially, most of the government contents are still in traditional format i.e. print version however AIS is working to digitize different contents. Access to government sources is free but official endorsement and partnership is still a big challenge for the non-government (both private & NGO) organizations to ensure proper validation. In addition, awareness on existing information platforms is very low and ICT fear (use of Internet) among the farmers is very high which lead low usage of the contents. Another short coming of the existing information platform is the absence of business model so many project based donor driven initiatives are popping up and dying down or running at low scale when the project life is over.

It is not known how adequate the existing repositories are:

- Is all the information presented validated, accurate, up to date, reliable, relevant? Which institutions generate the content
- What, if any, farmers and intermediaries are using these resources? What are the barriers to usage (internet access, literacy, language, relevance, actionability, etc.). Is the content even relevant for marginalized farmers?
- Is it easy for farmers or intermediaries to find answers to the questions they have?
- Is the degree of localization of information appropriate?
- Are the existing repositories being sufficiently promoted through public/private/NGO's/international organization/donors?
- Is material being used across different ICTs (e.g., are videos accessible in various formats and easily up- and downloadable; scripts for radio)
- Are the farmers' perspectives sufficiently taken into account (or this research generated content relevant only for researchers)? Are there mechanisms for two-way feedback?
- Can the private sector, including innovative farmers, post content on the existing sites?
- How supportive or inhibitive is the enabling environment, i.e., are the technologies (seeds, fertilizer, pesticides, treatments, etc.) that are recommended even available at the right time in the right amounts?

- Is there too much emphasis on production technology and too little information on process innovation, e.g., marketing?
- Is there sufficient proof of concept for the recommendations? Can the farmers visit demonstration plots or can they identify other farmers in the region already using the recommendations?

2. How can ICT Improve Two-way Communications for Extension to be Demand-driven?

In principle, ICT approaches can be designed to improve two way communication between the providers of content, intermediaries (extension staff), and users (farmers). For example, radio shows can offer a call in-section or promote listener groups. There should be systematic tracking of the type of questions asked by farmers when they use services like e-krisshok. It is also a matter of mindset whether a project really first listens to the communities they are trying to serve and not impose preconceived decisions and understanding. In principle, private sector for profit service providers should be well positioned to tailor their services to the actual needs of the clients because otherwise they cannot be successful and sustainable.

Thus, improved two-way communication begins with designing a demand driven, holistic approach. Identify the needs of the community/clients and match the approach. Be clear on who is supposed to be communicating with whom and where and secure potential sources of credible, localized information (to response to questions/needs that are identified). Use multimedia approaches and pictorial depictions to lower literacy barriers. Take into account the level of understanding and education of client and service provider. Improve responsiveness and timeliness so that the client does not lose interest in the relationship.

3. How does ICT in extension need to be blended with existing approaches to help move farmers from accessing information to adopting a practice?

The process of change requires more than just increasing access to information such as technical knowledge. If there is no market for the agricultural product to be sold profitably, or if production does not otherwise improve the household's livelihood, then the behavior change does not benefit the client (Figures 1 and 2).

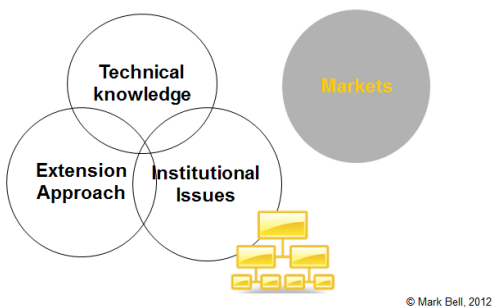


Figure 1: Needs for Successful Extension

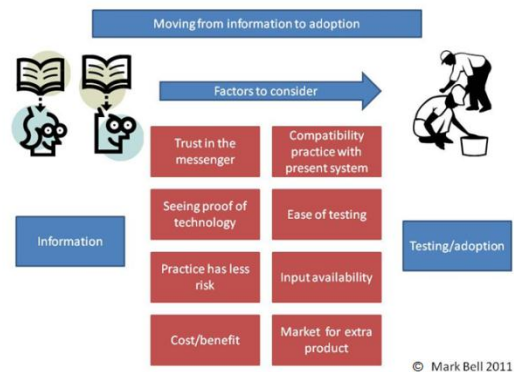


Figure 2 Moving from information to Adoption

Here are some practical ideas discussed during the workshop:

- Identify enthusiastic farmer to motivate others
- Work with advanced farmers and facilitate their access to information, which they can then and pass on
- Empower extension agents e.g., by providing them with business phones and tablet computers
- Develop videos in local dialect, picture drama
- Make sure that recommended practices can be observed at demonstration plots, Farmer Field Schools, model farmers, community plots. Offer exposure visits.
- Strengthen farmers groups and associations, improving their bargaining power in the market place (for inputs, outputs, but also advisory services)

4. How can ICT in extension be made affordable and sustainable?

It is not the absolute cost of an extension service, whether provided in a traditional approach (person to person or group, demonstration plots, farm days, etc.) or in an ICT enabled fashion, but the rather the relationship between cost and benefit. A service can be very affordable, but if it is not valuable, then it is worthless.

A basic cost saving measure is to build on existing resources, channels, and modes of communication. For example, lots of different centers like UISCs, FIACs, etc. are being established throughout the country by the public sector but also by entrepreneurs and through projects. This may very well lead to duplication of effort, and over-supply in some parts of the country but too few centers in others.

Similarly, use existing data available from different platforms to design programs (while making sure that locally relevant content is available). Engage local TV operators. Make information available at tea stalls (brochures, DVDs, internet access). Use mobile units (e.g., for showing films) rather than invest in stationary equipment. Consider involving the private sector by providing the right incentives and removing barriers (the government should create an enabling environment for private service providers). Perhaps input retailers could play a role in facilitating ICT enabled access to information relevant for farmers. Pursue cost sharing options between public and private sector. Allow for the generation of revenue through advertising rather than charging clients.

5. How can coordination and perhaps even integration of services be improved?

First off, there has to be a value proposition / reward for coordination because it is difficult, time consuming, and costly. Coordination is not an end in itself and the various stakeholders (e.g., the ICT actors described in the section above but also the various groups of agricultural producers, processors, extension staff, etc.) need to benefit from it, i.e., there needs to be a positive incentive for it. The whole must be bigger than the sum of its parts. While the government could take on a controlling function or mandate some form of coordination, real collaboration will only happen if the relationship is beneficial for all involved. Typically, it takes one or two actors to take on leadership responsibility and to facilitate coordination.

During the workshop no recommendation was made as to who could take on that role but it was suggested that the DAE consider taking that on or empowering another organization to do so. Also, it was agreed that informal opportunities for networking should be pursued and that having the contact information of the participants at this workshop will facilitate such efforts.

Furthermore, it was pointed out that the real benefit of coordination may arise at the local rather than the national level and that such coordination is probably already happening in some parts of the country. Perhaps greater autonomy should be granted to local actors.

Many rural development projects are (co-)funded by donors. It would pose a strong incentive for collaboration, if the monitoring and evaluation of such projects were to include indicators that track effective collaboration. For example, in the Feed the Future projects USAID could consider adding an indicator that assesses the extent to which USAID projects meaningfully link to and work with other USAID, other donor projects as well as public sector initiatives.

Major Lessons Learned From the Workshop and Subsequent Field Visits

There are many ICT initiatives in Bangladesh and the workshop was an excellent opportunity to map out present activities and collect information on keys for success. The workshop brought together 45 representatives from Government, Non-profit and private sectors and represented a wide cross section of those working in Agriculture. The observations below are drawn from the workshop and the subsequent two days of village visits by the MEAS team near Jesorre.

Needs. Discussions highlighted successful programs that do address problems farmers face. Many farmers and feedback from e-Krishok and others indicated that pests and diseases and their control were the major type of information requested by farmers. Farmers were also interested in seed, improved marketing and better prices.

Content. Farmers and others repeatedly stressed the need for a source of trusted credible relevant information. A central, readily available source of proven content is not presently apparent. Different organizations have access to different sources. The Bangladesh Rice Knowledge Bank is considered a fairly good example (although, it seems some updating would make it even stronger). It appears the linkages between information intermediaries and users with information providers could be strengthened to ensure needs-driven research agendas.

Trust. The need for both a trusted source of information and a trusted messenger were constantly emphasized. A key question for the use of ICT options is how do you build this trust while using ICT? In this respect existing extension systems where farmers get to directly see technology applied and its impact are still considered extremely important in the adoption process.

Intermediaries. The present principal sources of information for farmers were given as other farmers, input suppliers and extension officers and NGOs (for farmers served by an NGO run project). Extension workers seemed quite active in many areas. It was noted that there are many more input suppliers than extension workers – and farmers are repeatedly visiting the input suppliers.

Use of ICT. See table below for an overview. Note that in one village, farmers indicated they receive “push” text messages to notify them of agricultural events, etc.. The general sense is that this has become a bit like spam and tends to be ignored.

Sustainability. Many activities are project-driven and plans for sustainability are not always clear. A project or pilot based approach can be acceptable for proof of concept, but activities such as e-Krishok have sustainability elements incorporated from the start. Publically funded institutes have to define their on-going roles to support the overall information programs.

Application. Successful programs link needs to intermediaries to farm level application to generate user driven programs. Some applications like e-Krishok are user pay and thus are directly linked to users, so they are collecting information on both content wanted and effectiveness of the system of providing such content.

The table below shows present ICT and other media uses and potential application to aid in extension. It is a preliminary assessment based on farmer focus group meetings on Dec. 4-5 in Jessore. The findings provide a starting point for developing an ICT strategy but should not necessarily be seen as representative across regions.

Table 1. Use of media including ICT – Preliminary assessment based on farmer focus group meetings on Dec. 4-5 in Jessore

Media	Primary use	Amount used by farmers	Potential in extension?	Ag example
TV	National geographic, Hindi movies, Channel i	A lot, including access at tea shops	Raise awareness	Channel i
Radio	Little to none	Farmers had little interest in radio		
Internet	Government forms through union centers	Limited	Intermediaries are starting to use it to deliver services (InfoLady, health services)	Bangladesh Rice Knowledge Bank
Cell	Personal use plus for asking about prices and inputs	Quite common Note: Farmers expressed a sense of saturation re: pushed out messages	SMS and text? Issue is developing a trusted message using credible information sources.	e-Krishok
Video	Like videos that are fun	Presently seems limited	Range of options. Could be for raising awareness (informational and entertainment) or for technical explanation	Shushilan
News-paper	General information	Popular at one center	The papers is read e.g., for cricket scores – perhaps agricultural content could be popular	
Posters	Wall coverings in community centers?	Unknown	Unknown	Various examples were observed, also for nutrition

Summary Statement

Information and communication tools such as cell phones, the internet, radio, and television can dramatically improve farmers' and intermediaries' access to information relevant for rural households, production agriculture, and agribusinesses. The tools can be used to raise awareness or to provide specific information in response to questions about agricultural technologies, markets, prices, etc. However, these tools are just a part of the extension process and are most effective if combined with established good extension practice.

For extension in general and for ICT in particular to be effective, the service has to be **client focused** and **needs driven**, providing **credible content** and a **relevant and actionable message** through a **trusted messenger**. Furthermore, access to information is just part of the formula for success. Farmers have to see sufficient evidence that they are convinced to turn the new information received into 1) a willingness to test the approach and then 2) if the test is successful, adopt. Success of an IC tool or approach therefore also depends on **availability of required inputs**, **sufficient knowledge** to test and use those inputs appropriately, and **access to markets** for them to profitably sell their outputs.

Annex A: Resources

Public Extension Institutions

- Department of Agricultural Extension (DAE) www.dae.gov.bd within the Ministry of Agriculture
- Agricultural Information Service (AIS) www.ais.gov.bd within the Ministry of Agriculture
- Department of Agricultural Marketing (DAM) www.dam.gov.bd within Ministry of Agriculture
- Department of Livestock Services (DLS) www.dls.gov.bd within the Ministry of Fisheries and Livestock
- Department of Fisheries (DOF) www.fisheries.gov.bd within the Ministry of Fisheries and Livestock

Public Research and Education Institutions

- Bangladesh Agricultural Research Council (BARC) www.barc.gov.bd
- Bangladesh Agricultural Research Institute (BARI) www.bari.gov.bd
- Bangladesh Fisheries Research Institute (BFRI) www.fri.gov.bd
- Bangladesh Rice Research Institute (BRRI) www.brri.gov.bd
- Bangladesh Institute of Nuclear Agriculture (BINA) www.bina.gov.bd
- Bangladesh Jute Research Institute (BJRI) www.bjri.gov.bd
- Bangladesh Sugarcane Research Institute (BSRI) www.bsri.gov.bd
- Bangladesh Tea Research Institute (BTRI) www.btri.gov.bd
- Bangladesh Forest Research Institute (BFRI) www.bfri.gov.bd
- Bangladesh Livestock Research Institute (BLRI) www.blri.gov.bd
- Bangladesh Fisheries Research Institute (BFRI) www.bfri.org.bd

- Agricultural Training Institutes (ATI) www.dae.gov.bd/agriculture-training-institutes
- Bangladesh Agricultural University Extension Center (BAUEC) within Bangladesh Agricultural University www.bau.edu.bd
- Outreach Center of Bangabandhu Agricultural University <http://bsmrau.edu.bd>

Governmental and Policy Resources

- Access to Information: www.a2i.pmo.gov.bd/index.php
- Agriculture Information Service: www.ais.gov.bd
- Bangladesh Citizens Charter (UNDP): www.undp.org.bd/info/pub/Citizen's%20Charter%20a%20Manual.pdf
- Digital Bangladesh: www.digitalbangladesh.gov.bd
- e-Agriculture Vision (UNDP): www.undp.org.bd/projects/prodocs/A2I/e-Agriculture_Vision.pdf
- National Agricultural Extension Policy: www.dae.gov.bd/wp-content/uploads/2011/06/Natinal-Agricultural-Extension-Policy-NAEP.pdf

Extension in Bangladesh

- Article on eKrishok – New Agriculturalist September 2012
www.new-ag.info/en/focus/focusItem.php?a=2779
- IFPRI Worldwide Extension Study, 2011. www.worldwide-extension.org/asia/bangladesh.
- Innovations in Rural Extension – Case Studies from Bangladesh
<http://agroinsight.com/agricultural-extension.php>
- Participatory rural video centre in fostering women’s voices. A model from Bangladesh
www.csu.edu.au/_data/assets/pdf_file/0004/199138/EFS_Journal_vol7_n02_05.pdf
- USG. 2011. Transformation of Agricultural Research, Education and Extension in Bangladesh. Annex 4 Extension Services. Feed the Future May 2011
www.feedthefuture.gov/sites/default/files/country/resources/files/TransformationofAgriculturalResearchEducationandExtensioninBangladesh_May2011.pdf

ICT for Agriculture and Extension

ICT Resources Compiled by the MEAS Project:

- <http://www.meas-extension.org/resources/ict>
- <http://measict.weebly.com/index.html>

ICT in Agriculture: <http://www.ictinagriculture.org/ictinag/>

- Sponsored by the Agricultural and Rural Development unit of the World Bank

ICT for Ag Online Community: <https://communities.usaidallnet.gov/ictforag>

- Sponsored by USAID

ICT Update by CTA: <http://ictupdate.cta.int/en>

- Look into the many archived issues (come out on a bi-monthly basis) at
[http://ictupdate.cta.int/en/Issues/\(issue\)/69](http://ictupdate.cta.int/en/Issues/(issue)/69)

The e-Agriculture Community: www.e-agriculture.org

- e-Agriculture is a global Community of Practice, where people from all over the world exchange information, ideas, and resources related to the use of information and communication technologies (ICT) for sustainable agriculture and rural development.

USAID. 2012. **G8 New Alliance expert consultation on ICT and Extension Services**. Washington, D.C.

<https://communities.usaidallnet.gov/ictforag/node/335>

mFarmer and mAgri Initiative

<http://www.gsma.com/mobilefordevelopment/programmes/magri/mfarmer-initiative/>

Specific publications on Agricultural Value Added Services (agriVAS) using mobile phones

- Chapter 2 on Market Assessment and User Design:
<http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/04/marketingassessmentanduserneeds.pdf>
- Chapter 3 on Marketing:
<http://www.gsma.com/mobilefordevelopment/programmes/magri/mfarmer-initiative/>
- Chapter 4 on Service Design:
<http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/04/servicedesign.pdf>
- Chapter 5 on Commercial Model and Business Case:
<http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/04/commercialmodelandbusinesscaseforagrivas.pdf>

Annex B: Workshop on ICT in Agricultural Extension in Bangladesh

Conference Room (5th Floor), Hotel Riggs Inn, Dhaka-1212, Bangladesh December 03, 2012

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Links to Presentations Given During the Workshop

Phil Malone - ICT in Bangladesh 2012_12_03 = <http://db.tt/zQ1cNYUf>

Rikin Gandhi - Digitalgreen - Social media for ag development 2012_12_03 = <http://db.tt/lx4wfgKi>

Suzanne Andrews - CRS Farmbook 2012_12_03 = <http://db.tt/ZVZtHwSf>

N. Anandaraja - TNAU e-extension 2012_12_03 = <http://db.tt/6k8eg1Zy>

Examples of ICT for Ag Extension in Bangladesh Discussed During the Workshop

Who/What	ICT Approach/tool	Focus in Ag Extension	Status
Multiple tools and approaches			
Agricultural Information Service, AIS	Radio TV Mobile Video Show Monthly bulletin Newsletter Web: e-krishi web portal	Information dissemination through different ICT media	Nationwide service network
NATP	Mobile and Computer	Technology Transfer	
D-net InfoLady	Mobile & web based	Agricultural content has not been a major focus so far but is seen as having potential	
Bangla Track		Weather info	
Internet platforms and repositories			
SRDI (FRS)	Web based	Soil/fertilizer recommendation	Available for 200 upazillas
DA Market	Web based	Market price	Nationwide Regular commodity price information
EPO (BIID) extension process outsourcing	Web based inputs info and ICT enabled communication & demo of extension services	Extension service through demonstration and new technology introduction	Pilot
Cell Bazaar	Web based	(like Craigslist)	Covers agric produces
Gram web	Web based	info on villages	
BIRRI (IRRI) Rice Knowledge bank	Technical materials in digital format, some also in print	Focus on rice production	Ongoing
Call centers / help desks (“customized pull”) and automated services (“push” SMS or voice messages, “pull” from automated systems such a prices or weather)			
SMS agriculture info (e-krishok), (BIID)	Bangla link Phone experts	Information services and market linkage	
Agriculture help desk – call center (e-krishok),	Centre and mobile based (Short code)	Information services	Ongoing and Commercialized

Who/What	ICT Approach/tool	Focus in Ag Extension	Status
(BIID)			
BC 7676 Bangla link	Mobile Phone	Information	(since 2009)
Bangla link/Win Incorporate	Call centre	Information	Ongoing
Krishi Bazaar (BL IVR)	Mobile Based (IVR)	Information	
mPower		Livestock	
Broadcasting			
Agriculture program – Channel I and BTB	Television	Broad range of agriculture related themes. Awareness raising more than educational or addressing particular production issues	Ongoing
Rural information centers (brick and mortar) with (potential for) Internet access			
Ministry of Local Government and Rural Development, LGRD	Union Info Service Centers, UISC (in public-private partnership)	Young entrepreneurs generating income by providing internet access and other services	Starting with a pilot of 10 UISCs, now scaled up in 4502 locations
UISC	Telecenter	Information services	Ongoing in 4502 centres
GPCIC – GP	Information Centre	Information service	Ongoing
CRC (Dam, Shushilan)	Information Centre (NGO based)	Generic Information	Ongoing
Rural Information Center	Some with internet, Bangla link phone	Information services	
Grameen phone	Community Information Centre and Market Linkage Program	Information and marketing	500 CIC operation
Helvetas Swiss Intercooperation	Upazila Local Service providers		Pilot (58)
AR Mallick			
AR Mallick	Digital training material		
CARE Agro shops			
e-vouchers (A2I)		Sugarcane	
AMIS – DAE (Government) – Daffodil Uni			
Public food distribution system – governmental			

Annex C: Background on MEAS, BIID and AECB

A grant from the United States Agency for International Development (USAID) funds the work of the MEAS consortium under a cooperative agreement between USAID and the University of Illinois. As a subwardee to the University of Illinois at Urbana Champaign (ILLINOIS) and thus as a new member of the MEAS consortium, the Bangladesh Institute of ICT in Development (BIID) assists by coordinating and contributing to a host of activities to strengthen the utilization of Information and Communication Technology (ICT) for agricultural extension within the framework of the newly designed USAID/Bangladesh Agricultural Extension Capacity Building (AECB) Activity. AECB is indented to strengthen extension and advisory services in Bangladesh, specifically in the Feed the Future target regions. MEAS has been tasked by USAID to provide support to the AECB project in achieving success under what is designated as Intervention 2 of AECB, namely the expansion of the use of ICTs to support the provision of extension services. This dimension of the AECB activity addresses how improved utilization of information and communication technologies (ICT) can play a critical role in any of the four aspects identified as key challenges for extension:

1. Greater linkage of research outputs to extension
2. Greater linkage of farmers back to research and extension in order to be more responsive to farmer needs
3. Provision of more site and crop-specific technical/production information concerning more diversified production systems in more heterogeneous agro-ecological conditions
4. Greater integration of farmers into markets via the provision of market-related information (e.g., prices of commercial crops in various local and national markets, market quality requirements such as size, taste, colour, hygiene, etc.)

ICT cover a range of potential tools and approaches including video, television, radio, internet, cell phones (simple ones with only voice and text/SMS capability; as well as smart phones with internet access and apps). For ICT to be used effectively it typically takes contributions from a range of extension players including government, NGO and private sector (input suppliers, processors, telecoms).