ICT and Distance Learning for Agricultural Extension in Low Income Countries

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INTRODUCTION

About 2 billion people in low-income countries are dependent upon smallholding farming for their livelihoods. These are among the world's poorest people. Most of them lack land tenure and farm in regions with limited land and water resources. Many must cope with drought, desertification, and environmental damage caused by failed land reforms, large-scale monocropping, overgrazing, logging, destroyed watersheds, and the encroachment of new pests and diseases. They use only the most primitive of tools and they lack the knowledge and skills to improve their farming methods, value-add their produce, and compete in national and global markets. Many of these smallholder communities have been devastated by HIV/AIDS. In some regions of sub-Saharan Africa, food production has dropped by 40%, and it is estimated that over the next 20 years, 26% of the agricultural labour force will be lost to this pandemic. And demographic and economic changes in the low-income nations are increasingly leaving farming in the hands of women, who lack the knowledge and resources to farm efficiently.

The Food and Agricultural Organization of the United Nations (FAO, 2000) stresses the importance of information and knowledge in achieving a food-secure world for present and future generations. There is a massive need for agricultural extension to maintain the natural resource base, for example, to help smallholders increase cropping intensities, diversify into higher-value commodities, and adopt new methods of natural resource management and integrated pest management (Swanson, Bentz, & Sofranko, 2003).

In its traditional forms, agricultural extension has aimed at transferring research findings to farmers through face-to-face training and farm visits. It has been top-down, limited in scope, and slow to change ideas and practices. The more recent approaches to extension are farmer-demand-driven (Lightfoot, 2001). They empower the smallholders to form themselves into learning communities, identify needs, trial proposed methods, and adopt, modify, or discard practices according to their findings.

They do not depend solely upon information, ideas, and practices provided by agricultural researchers and extension workers. The farming communities are encouraged to share their knowledge and experience.

The major challenge lies in finding how to fast-track such extension programmes more widely and equitably. Because of their locations or other personal circumstances, many smallholders cannot currently access extension programmes. To make matters worse, many extension services are now being downsized, decentralized, privatized, or only made available on a fee-for-service basis, which puts them even further out of reach of the smallholders. There is, therefore, enormous need and potential for ICT and distance learning to be applied to expanding and strengthening agricultural extension in low-income countries.

TECHNOLOGIES AND METHODOLOGIES

ICT and distance learning allow training and information to be delivered far beyond the traditional catchments of the providers. They allow for interaction, negotiation and exchange as well as the transmission of content. By allowing rural communities to be contributors and communicators and not merely passive consumers, they have the power to really help to change hearts and minds (Richardson & Paisley, 1999; Mundy & Sultan, 2001).

A number of agricultural research and extension agencies are now adopting these newer approaches. Some focus on using technology to overcome the physical and communications barriers between researchers and extension workers, while others are concerned with developing the tools to provide the smallholders with access to databases, decision support tools, online discussion groups, advice, news items, etc.

It should not be assumed that computer, Internet, and satellite technologies invariably provide all the answers for this work. Connectivity, cost, and a lack of technical know-how and support are still major constraints within

Table 1. Technologies, applications, and their strengths and weaknesses in extension

Technology or application	Strengths	Barriers to utilization	Examples
Printed materials	Can play an important role in extension. Compact, well-suited to self-paced learning and often the most cost-effective medium.	Require literacy in the smallholders. May be slow, difficult and costly to deliver into remote communities. Lacking moving images, may not be able to demonstrate some processes. Can be slow and costly to customize to local needs and languages.	Booklets, posters, pamphlets and handouts are used in many extension programs, sometimes in conjunction with other media.
Radio	Commonly available, relatively low-cost technology with extensive reach in low income nations. The costs of a community radio station need not be high – Radio Apac (http://radioapac.tripod.com/liraext.html), a Commonwealth of Learning Media Empowerment (COLME) initiative in Uganda (http://www.col.org/colme/about%20COLME.htm), broadcasts from a radio station that fits into a suitcase, hooks up to commercial FM networks and satellite feeds, has a 50km radius, runs on car battery or solar power, and costs about US$3,500. Similar systems are used elsewhere in Africa and in Canada, Jamaica and South America.	The privatization of some state radio stations has led to commercial prices being charged for timeslots which may be beyond the means of the extension providers. Power supply and even battery costs may be problems for some farming communities. Radio reception may be problematic in some mountainous regions.	Agricultural radio programmes are used to support extension in, e.g., Nigeria, Uganda, Fiji, and Trinidad and Tobago. Other examples include Simli (Friendship) Radio in northern Ghana (http:www.odi.org.uk/agren/papers/agrenpaper_127.pdf), and the Tamil Nadu Agricultural University's extension programme (http://www.tnau.ac.in/aabout.html) that use a mix of radio broadcasting, audiocassettes, print, Correspondence, and one-day contact programmes
Farm Forums	'Phone-in' and 'listen-discuss-act' radio programmes enable smallholders to form themselves into self-help groups and work with the broadcasters and extension workers in identifying issues, collecting data, defining and analyzing problems, and discovering workable solutions.	Production costs can be high. A number of Farm Forums have ceased as a consequence of the privatization of state radio and subsequent increase in costs of air time.	The Papua New Guinea Educational Development Centre (EDC) Multichannel Learning Centres combine interactive radio broadcasts in pidgin with audience participation by local clans with the aim of finding ways of managing and conserving rainforest under threat from loggers and land developers (http://www.main.edc.org/mosaic/Mosaic2/building.asp). Farm Forums have also been used in Africa, India and elsewhere.
Radio and the Internet	Combines the motivational and 'reach' advantages of radio with the 'search' and 'interaction' capacities of the computer and the Internet.	Lack of infrastructure, technology, technical support and computer skills. Production costs.	In the Kothmale Community Radio Internet Project (http://www.kothmale.net) in Sri Lanka, daily programmes are broadcast in which presenters browse the Internet live in response to listeners' requests, explain the information accessed, and enable local communities to develop Websites that are then hosted on the station's server.
Television	Highly motivational. Provides sound and moving pictures to demonstrate processes. Effective in low literacy communities.	High costs of production. Limited penetration in some regions.	India's cable ETV has a programme, Annadatta, in which trained agricultural journalists use video to develop programmes for local farmers in Andhra Pradesh. Gujarat Agricultural University and Andhra Pradesh University in India have experimented with narrowcast television (http://www.cta.int/observatory2003/case_studies_Case_study_India.pdf).
Audiocassettes and videocassettes	May be sent to communities unable to receive radio or television broadcasts. May also be used to exchange information and practices between communities and other groups.	Dispatch may be slow and cumbersome.	Used in a number of extension programmes programmes as an alternative or a supplement to broadcasts.

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