

Problem: Agriculture post-graduate students, faculty, and extension workers do not have access to up-to-date material and information, including textbooks, reference and training material, local and international journals, audio-visual aids, etc.

Building Online Delivery Systems and Repositories for Agricultural University/Extension Publications and Journals

1. THE CONCEPT

Most newly published material is in electronic format in much of N. America and Europe. Even when a print version is available, the original is electronic. This is common even for small publishers, academic society publications, and extension material. However, print is often still the norm for much of the rest of the world, limiting access to materials. Access to extension materials, agricultural journals, and historical agricultural material of relevance to African and Asian agriculture will be improved by conversion to electronic format. To further support wide usage, a delivery platform that supports multiple languages will be chosen.

2. RATIONALE AND EVIDENCE THE PROJECT CAN BE SUCCESSFUL

The solution to the problem is to convert to electronic format extension materials, appear only in print. The principles of digital imaging have been used in a variety of projects, such as the Making of America Project at the University of Michigan (<http://moa.umdl.umich.edu>) and Cornell University (<http://moa.cit.cornell.edu>), the Core Historical Literature of Agriculture (<http://chla.library.cornell.edu>) and the Home Economics Archive: Research, Tradition, and History (<http://hearth.library.cornell.edu>) at Cornell University. These digital imaging technologies and principles have also been applied more recently by large-scale projects, such as Google Books, Microsoft's Windows Live Book Search, the Million Book Project, and the Open Content Alliance.

3. EXPECTED BENEFITS OF THE PROJECT INCLUDING COMMENTS ON SUSTAINABILITY AND SCALE

Text pages, color plates, complex illustrations, and black and white photographs scanned as high quality digital images that are then made available to agricultural university and extension communities will significantly improve access over what is currently possible. Text should be scanned as 600 dpi bitonal (1 bit) images; color plates as 300-400 dpi color (24 bit) images; and complex illustrations and black/white photographs as 300-400 dpi gray-scale (8 bit) images. This approach, along with images in a standardized format, such as TIFF or JPEG200, and lossless compression schemes allows images to continue to be useful as bandwidth increases and high definition monitors are developed.

Page image files processed to generate optical character recognition (OCR) and XML will enable searching and browsing for quick and targeted retrieval of information. Content will be displayed to the user through page images, ensuring that the user sees the most accurate representation of the original print material. Navigation will be eased by noting pagination and highlighting document structures. Digital masters will meet the functionality

requirements of the *Benchmark for the Faithful Reproductions of Monographs and Serials* (www.diglib.org/standards/bmarkfin.htm).

Delivery systems will be developed using free or low-cost open-source software, such as Greenstone (<http://www.greenstone.org>) or D-Space (<http://www.dspace.org>). Both packages require a relatively low investment of IT professional time and are customizable to some degree. Both are also able to handle a variety of materials, such as digital images, digital audio, and digital video. Greenstone may be especially useful for this project's purposes since it supports many languages.

Preservation of electronic materials is a challenge to all libraries and institutions that have a large corpus of digital materials. Thus, it is necessary to plan from the beginning for the long-term preservation of the electronic material created for the project. While the website(s) created for this project should be mirrored at a remote location, simple back-up systems could also be employed. For instance, while the electronic collections are small they could be burned to CD or DVD for storage purposes, as long as the media is refreshed annually. Long-term preservation requires the development of a preservation repository or the use of a commercial repository.

4. HOW THE PROJECT WILL TARGET THE NEEDS AND BE OF SPECIFIC BENEFIT TO WOMEN SMALLHOLDERS

Digitization of a wide range of agricultural and related materials will greatly improve the amount and type of information currently available to extension personnel, equipping them to better address the needs of women small-holder farmers.

5. PROJECTED COSTS OF THE PROJECT

Materials can be digitized and made available in an online environment in the US for approximately \$1 (USD) per page. The scanning itself costs \$.20 to \$.25 per page (USD). Other costs come from the pre-scanning and post-scanning work described above. Costs in India or Africa, for instance, would be lower due to the difference in labor costs. Funds would also be used for staff training and for the purchase and maintenance of servers at each participating institution and for back-up servers. A detailed business plan would be developed prior to implementation.

6. MEASURES OF SUCCESS

The number of pages digitized would be the first measure of success. Once the material is available electronically the number and types of searches and pages viewed would demonstrate the amount and efficiency of use of the materials. User surveys would indicate information needs, allowing for the addition of further content and enhancing the website's tool set.

7. RISKS

Preservation of electronic materials is a challenge to all libraries and institutions. Solutions to this problem are beginning to emerge, especially from some research libraries in the US and Europe. However, it will take time for the establishment of a reliable system, and is likely to be expensive to implement.