The *Journal of International Agricultural and Extension Education* is the official peer-reviewed, refereed publication of the Association for International Agricultural and Extension Education. The purpose of the *Journal* is to enhance the research and knowledge base of agricultural and extension education from an international perspective.

Articles intended for publication should focus on international agricultural education and/or international extension education. Articles should relate to current or emerging issues, cite appropriate literature, and draw out implications for international agricultural and extension education. **Manuscripts should not have been published or be under consideration for publication by another journal.**

Three types of articles are solicited for the *Journal*: Feature Articles; Commentary Articles; Tools of the Profession Articles.

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Feature articles focus on philosophy, current or emerging issues, and the methodology and practical application of specific research and appropriate technologies, which have implications for developed and developing countries. For publication in the *Journal*, feature articles must pass the *Journal's double-blind, peer-review process*, which utilizes peer reviewers who evaluate manuscript content and ensure readability. Reviewers are selected usually from the membership of the AIAEE. In the double-blind, peer-review process, all reference to author(s) is removed before the manuscript is sent to reviewers.

**Commentary Articles**

Commentary articles state an opinion, offer a challenge, or present a thought-provoking idea on an issue of concern to international agricultural and extension education, including a published article in the *Journal*. Commentary articles are reviewed by two members of the editorial board for appropriateness and relevance to the *Journal*, and for readability.

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Tools of the Profession articles report specific techniques, materials, books and technologies that can be useful for agricultural and extension educators in a global context and/or in a country/region. Tools of the Profession articles are reviewed by two members of the editorial board for appropriateness and relevance to the *Journal*, and for readability.

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## U.S./Canada Representatives

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution/Address</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gary J. Wingenbach, Editor</td>
<td>Department of Agricultural Education</td>
<td></td>
</tr>
<tr>
<td>Texas A&amp;M University</td>
<td>2116 TAMU, 112 Scoates Hall</td>
<td></td>
</tr>
<tr>
<td>College Station, TX 77843-2116</td>
<td>Ph. (979) 862-1507</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax (979) 845-6292</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:g-wingenbach@tamu.edu">g-wingenbach@tamu.edu</a></td>
<td></td>
</tr>
<tr>
<td>Nick T. Place, Associate Editor</td>
<td>Dept. of Agri. Education and Communication</td>
<td></td>
</tr>
<tr>
<td>University of Florida</td>
<td>219 Rolfs Hall / PO Box 110540</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gainesville, FL 32611-0540</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ph. 352-392-0502, ext. 227</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax 352-392-9585</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:nplace@mail.ifas.ufl.edu">nplace@mail.ifas.ufl.edu</a></td>
<td></td>
</tr>
<tr>
<td>James R. Lindner, Associate Editor (Tools)</td>
<td>Department of Agricultural Education</td>
<td></td>
</tr>
<tr>
<td>Texas A&amp;M University</td>
<td>2116 TAMU, 228C Scoates Hall</td>
<td></td>
</tr>
<tr>
<td>College Station, TX 77843-2116</td>
<td>Ph. (979) 458-2701</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax (979) 845-6292</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:j-lindner@tamu.edu">j-lindner@tamu.edu</a></td>
<td></td>
</tr>
<tr>
<td>Dennis W. Eaton, Associate Editor (Book Review)</td>
<td>Department of Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>424 Kennedy Hall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cornell University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ithaca, NY 14853</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ph. (607) 254-7277</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax (607) 255-7905</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:dwe7@cornell.edu">dwe7@cornell.edu</a></td>
<td></td>
</tr>
<tr>
<td>Gustav Düvel, AIAEE President</td>
<td>South African Institute of Agricultural Extension</td>
<td></td>
</tr>
<tr>
<td></td>
<td>University of Pretoria</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pretoria 0002, South Africa</td>
<td></td>
</tr>
<tr>
<td>James J. Connors, Past Editor</td>
<td>Dept of Human &amp; Comm. Res. Development</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Ohio State University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>216 Agricultural Administration Building</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2120 Fyffe Road</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Columbus, OH 43210-1067</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ph. (614) 688-3178</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax (614) 292-7007</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:connors.49@osu.edu">connors.49@osu.edu</a></td>
<td></td>
</tr>
<tr>
<td>Randall J. Andreasen, Assistant Professor</td>
<td>Department of Agricultural &amp; Extension Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New Mexico State University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Box 30003, MSC 3501</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Las Cruces, NM 88003-8003</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ph. (505) 646-4511</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax (505) 646-4082</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:randaroo@nmsu.edu">randaroo@nmsu.edu</a></td>
<td></td>
</tr>
<tr>
<td>Jerry D. Gibson, Associate Professor</td>
<td>Coordinator of Graduate Programs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension Specialist/Program and Staff Dev.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dept. of Agricultural and Extension Education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>230 Smyth Hall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Virginia Tech University</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blacksburg, VA 24061</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ph. (540) 231-6224</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fax (540) 231-6284</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:gibsonj@vt.edu">gibsonj@vt.edu</a></td>
<td></td>
</tr>
<tr>
<td>Edna L. McBreen, Associate Vice Chancellor</td>
<td>University of Connecticut-Tri-Campus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rowland Government Center</td>
<td></td>
</tr>
<tr>
<td></td>
<td>55 West Main Street, Suite 500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Waterbury, CT 06702</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ph. (203) 805-6580</td>
<td></td>
</tr>
<tr>
<td></td>
<td><a href="mailto:edna.mcbreen@uconn.edu">edna.mcbreen@uconn.edu</a></td>
<td></td>
</tr>
</tbody>
</table>
World Region Representatives

David Wissink, Executive Director  
Ok Tedi Development Foundation  
PO Box 1 Tabubil  
Western Province  
PAPUA NEW GUINEA  
Ph. +675 548-3055  
Fax +675 548-9603  
foundation@oktedi.com

Anibal Quispe, Ph.D.  
Agricultural Education and Extension  
Km.35.5 Carretera Mexico-Texcoco, Montecillo  
Texcoco 56230

Raymond Auerbach, Director  
Rainman Landcare Foundation  
Peacevale Road  
Hillcrest  
SOUTH AFRICA  
auerbach@iafrica.com

Paul Schuetz, Ph.D.  
Agricultural Economics  
Dag_Hammerskjold-Weg 1-5  
Eschborn 65760  
GERMANY  
paul.schuetz@gtz.de

Prof Artur Cristóvão  
UTAD, Economics and Sociology Department  
Av Almeida Lucena 1  
5000-611 Vila Real  
PORTUGAL  
acristov@utad.pt

Eduardo Delgado, Ph.D.  
Instituto Nacional de Investigaciones Agrícolas  
INIA-Barinas  
Barinas 5201, apartado postal 178  
VENEZUELA  
delgado_ed8@hotmail.com  
duqueedu@yahoo.com

AIAEE 2001-2002 OFFICERS

Gustav Düvel, President  
South African Institute of Agricultural Extension  
University of Pretoria  
Pretoria 0002, South Africa

John Richardson, Past President  
North Carolina State University  
PO Box 7607  
Raleigh, NC 27695

Steve Jones, President Elect  
University of Minnesota  
240 Vo Tech Building, 1954 Buford Ave  
St. Paul MN 55108-6078

Michelle Owens, Board Member at Large  
Extension, Education, Communication and Training Officer  
FAO Regional Office for Africa  
P.O. Box GP 1628  
Accra, Ghana

Frank Brewer, Secretary  
Michigan State University  
408 Agriculture Hall  
East Lansing, MI 48824-1039

Jean-Claude Bizimana, Graduate Student Rep  
Michigan State University  
408 Ag Hall  
East Lansing, MI 48824

Nick T. Place, Treasurer  
Dept. of Agri. Education and Communication  
University of Florida  
219 Rolfs Hall / PO Box 110540  
Gainesville, FL 32611-0540
Greetings to all readers of the Journal of International Agricultural and Extension Education (JIAEE) and to all members of the Association for International Agricultural and Extension Education (AIAEE)!

The summer months seem to pass by more quickly as I get older. I don’t know what the hurry is, but it seems like only yesterday that many of us gathered in beautiful Durban, South Africa for the 18th Annual AIAEE Conference. In general, this issue is devoted to publicizing our collective benefits from that conference, and specifically, we congratulate and applaud the scholarship of selected members by publishing their outstanding papers, posters, and carousels. It should be noted that the Journal’s Editorial Board Members provided a huge service this summer by completing the peer-review of all outstanding papers in a most expedient manner.

Several items were discussed at the JIAEE Editorial Board meeting held in conjunction with the Annual AIAEE Conference. First, it was decided that an online subscription form be created and posted on the Journal’s Web site. This task is complete and can be accessed at http://www.aged.tamu.edu/aiaee/jiaee/journalsub.asp. Second, board members ask that all subscribers contact their local university or public library and encourage them to subscribe to the Journal. You may entice many libraries’ interest in a JIAEE subscription if you “gift” them a one-year subscription. Library subscriptions are $45 USD/annually. Individual subscriptions can be acquired for the low cost of $25 USD/annually. Third, board members decided that email and diskette versions of JIAEE will not be available beginning with this issue. Instead, JIAEE will be published in hard copy and electronic (Web-based on a closed server) formats only. This action reduces the problems the JIAEE was experiencing with diskette formats and corruptible email file attachments. Finally, board members passed a resolution that manuscripts will have only three opportunities to be peer-reviewed by JIAEE before they can no longer be submitted for review and possible publication in the JIAEE.

A new Web site has been established at http://www.aged.tamu.edu/aiaee/jiaee/index.htm. Very soon, the JIAEE will enjoy a paperless peer-review process. Databases and corresponding Web sites are being built and tested at the moment. You can expect to submit your manuscripts electronically, review others’ manuscripts and submit your review forms through the Internet sometime this fall. I hope you find the new peer-review process a much needed benefit for our profession. Once the online submission and peer-review process is completed, I will post a notice on the AIAEE listserv. Of course, for those who prefer to use old technologies, JIAEE will continue to accept manuscripts in paper form, but the review process will take longer to complete.

I wish all of you a very successful year as we enter the last half of 2002. We should all continue to improve the scholarship and rigor in the JIAEE. I look forward to receiving your future manuscripts. Please continue to recruit your colleagues, students, and acquaintances into the AIAEE. It doesn’t take much effort. You could start by showing or emailing someone the AIAEE Web site location at http://ag.arizona.edu/aiaee/. Or, you could show someone the JIAEE Web site today. Above all else, do what you can to promote greater understanding of agricultural and extension education worldwide.

Sincerely,

Gary J. Wingenbach, Editor
Journal of International Agricultural and Extension Education
Association for International Agricultural and Extension Education
18th Annual Conference

Durban, South Africa
May 26-30, 2002

Outstanding Papers

Outstanding Paper Presentation

Extension Professional Staffs’ Attitudes toward Participatory Approach of Extension Activities and Rural Development
Hassan Sadighi and Gabraeel Mohammadzadeh
Tarbiat Modarres University

1st Runner-Up Outstanding Paper Presentation

Urban Farmers as Extension Domain: The Case of Atteridgeville (Pretoria, South Africa)
M. J. Maswikaneng, W. Van Averbeke, R. Böhringer, & E. Albertse
Technikon Pretoria

2nd Runner-Up Outstanding Paper Presentation

Factors Associated with the Use of Pesticides in Uganda: Strategic Options for Targeting Integrated Pest Management (IPM) Programs
J. Mark Erbaugh and Joseph Donnermeyer, The Ohio State University
Samuel Kyamanywa, Makerere University

3rd Runner-Up Outstanding Paper Presentation

Farmer Field Schools and the Future of Agricultural Extension in Africa
Brent M. Simpson, Michigan State University
Michelle Owens, FAO Regional Office for Africa, Accra, Ghana

Outstanding Graduate Student Paper Presentation

Hope and Despair: Extension Agents in a Young Democracy
Tsakani Ngomane and Constance Flanagan
The Pennsylvania State University
Extension Professional Staffs’ Attitude toward Participatory Approach of Extension Activities and Rural Development

Hassan Sadighi, Assistant Professor
Gabraeel Mohammadzadeh, Former Graduate Student
Agricultural Extension and Education
Tarbiat Modarres University, Tehran, Iran


Abstract
The main purpose of this study was to assess the extension workers’ attitude toward Participatory Technology Development (PTD). The population of this study consisted of all 282 professional staffs from provincial extension organization in the province of West Azarbiajan, Iran. A three parts questionnaire was developed to collect needed data for the study. The result showed that the majority of extension workers’ attitude toward PTD was classified as “positive”. This indicates that the professional staffs have a great potential to succeed in fulfilling the goals of PTD. However, the majority of the professional staffs’ involvement with PTD has been characterized as “weak”. The result of the linear multivariate regression indicated that 7.6% ($R^2=0.076$) of the variance in the staffs’ attitude toward PTD could be explained by their level of individual involvement in participatory approach. This indicated that there are other variables that affect the variance in staffs’ attitude toward PTD.

Introduction
Technology transfer institutions have been accused of following top-down approaches, and rightly so. Many extension scientists are now convinced that it is no longer desirable to use a transfer of technology approach in which the extension administrators decide on the target, and subject matter contents to be realized by field-level extension. The challenge for extension has been to develop strategies and approaches for optimum involvement of the eventual users of the technology in the entire process, starting from the identification of a field problem to the actual generation of the possible solution. It has been suggested that extension organizations should come up with client-oriented approaches rather than doing a “bulk delivery” of agricultural practices. The chances of adoption of any new technology increase considerably if its potential users are involved in its development from the very beginning. The same logic applies to the academic institutions in terms of following a “participatory curriculum development” approach which is now being implemented in many post-graduate degree programs at leading universities around the world (Quamar, 2000). Therefore, a more participatory approach is preferred, in which farmers decide which changes are desirable and what kinds of supports are needed from extension to realize these changes (van den Ban, 2000).

In recent years there has been a growing literatures advocating various forms of participatory approaches, such as Farming Systems Research and Extension (FSR&E), Participatory Resource Flow Mapping (PRFM), and Integrated Pest Management (IPM), which allow farmer-clients to be part of extension process. Moving from Rapid Rural Appraisal to Participatory Rural Appraisal (PRA), and from Farmer Participatory Research to Participatory Technology Development (PTD), produced valuable critiques, that could benefit implementation of these approaches in a variety of different situations. The principles behind FPR and PTD are clear enough: research done by scientists in partnership with farmers is likely to produce much more appropriate and adaptable technology, because it allows local knowledge (Indigenous nature) and the normal experimental capacity of farmers to influence and guide the research process. PTD focuses on increasing the learning capacities of farmers, i.e. on their capacity to observe, to infer and to anticipate on the basis of observation, take decisions for action by applying principles to locality-specific conditions, to experiment, to act and to evaluate (Groot, & Ling, 1999; World Bank, 1995).
In many countries in Africa and Asia encouraging experiences have been reported with approaches such as PRA, and PTD. Although these relatively new approaches focus on different aspects of technology development with participatory methods, they all highly value the knowledge and experience of farmers and other relevant stakeholders. Three thematic areas of participation are assumed to be crucial in effective PTD, which includes farmer participation; participation by agricultural researchers; and participation within a multidisciplinary team of scientists and practitioners involved in rural development (Sutherland, Martin, & Salmon, 1998). In PTD innovations emerge from interactive learning among different social actors of a knowledge system operating together. The implementation of PTD aims at the development of technologies for improving the agro-ecological system as well as the development of the capacity of the local community to sustain the technology development process (van den Ban, 2000). In Zimbabwe, participatory process were used successfully in promoting sustainable management of natural resources and food security in smallholder farming areas (Hagmann, Chuma, & Murwira, 1996).

In Iran, in recent years, number of PTD projects have been used in different provinces for the purpose of making the extension organization to become more efficient in generating research knowledge based on farmer ‘s needs (Chizari, Gahmani, & Lindner, 2001; Chizari, & Mohseni, 1999)and delivering applicable information and techniques to improve farmer’s professional conditions. Attempts to apply PTD principles in Iran have not been without encountering number of difficulties and criticisms. Despite these and other challenges, scientists observed that favorable attitude of extensionist and researchers are essential in order to promote PTD. Scientists suggested that extension workers could develop through training the attitudinal predisposition necessary for adopting PTD. However, the success of participatory strategy was found to be dependent not only on a change in the attitudes and behaviors of the extension workers and researchers, but also on institutional and other contextual factors (Youngman, & Maruatona, 1998).

**Purpose and Objective**

The main purpose of this study was to assess the extension workers attitude toward participatory approach of extension activities and rural development, and more specific objectives were to:

1. Determine the extension workers’ professional characteristics and their level of involvement in participatory approach.

2. Examine the level of decentralization practiced in their organization as measured by Likert’s Profile of Organizational Structure (POC) instrument.

3. Determine the professional staff’s attitude toward PTD.

4. Assess the relationship between their attitude toward PTD and their professional characteristics.

5. Determine how much of the variance in extension workers’ attitude could be explained by independent variables of the study.

**Methodology**

The population of this study consisted of all 300-extension workers in the province of Western-Azarbajian, which is located in northwest of Iran. By a complete randomized sampling technique, 210 of the extension professional staffs were selected as a sample for the study. Sample size was determined and supported by studies of Krejcie and Morgan (1970). A questionnaire consisting of three parts was designed to collect needed data for the study. In constructing appropriate questionnaire suitable for the study, authors were aided by pervious related attitude studies (Sadighi, 2002; Sadighi, 2001; Sadighi, Raven, & Taylor, 1997). Part one of the questionnaire related to information on professional staffs’ characteristics, including level of staffs’ involvement in participatory approach, the extent of staffs’ participatory experiences with farmers and researchers, and finally, the extend of participatory information obtained by the professional staffs.

Part two of the questionnaire consisted of nine main criteria (27 questions), designed to measure the professional staffs’ attitude toward PTD. An overall attitude score for each respondent was measured by computing and adding up all responses to the 27 questions (based on a Likert’s scale ranging from 0 to 5). In order to characterize staffs’ attitude toward
PTD, the following formula was applied and four categories shown in table 3 were established (Negative Attitude=A: Minimum score ≤ A<Mean score - SD; Relatively Negative Attitude=B: Mean score - SD ≤ B<Mean score; Relatively Positive Attitude=C: Mean score ≤ C<Mean score + SD; Positive Attitude=D: Mean score + SD ≤ D≤ Maximum scores).

In part three, a Likert’s instrument, Profile of Organizational Characteristics (POC) was adopted and utilized to measure management style practiced in the extension organization. The POC allowed the extension staff to briefly describe the management system as they perceived being practiced in the organization, and gave them an opportunity to indicate which management system they desired in the future. The mean responses ranging from 0 to 20 that were converted to Likert’s management system categories: Sys= (X) 4/20 + 0.5 where Sys= Management System; and X = The overall mean of management score computed for each respondent. To characterize management system, it was assumed that System-1 covers the range from 0.05 to 1.50; System-2 covers 1.51 to 2.50; System-3 covers 2.51 to 3.50; and System-4 covers 3.51 to 4.50 (Likert, 1979). Management systems ranging on a continuum from a most despotic and authoritative management (system-1) to a participative management (system-4). System 2 is less authoritative, and system 3 is less participative management structure.

Content validity of the instrument was determined by a panel of experts in the field. A pilot study was conducted in the Central province on a similar population to determine the reliability of the questionnaire for the study. Cronbach’s Alpha reliability coefficients of 0.81 and 0.87 were achieved respectively for the attitude and the POC parts of questionnaire. A reliability coefficient of .92 for the POC instrument was reported earlier by Sadighi (2001). In a similar study profiling organizational characteristics of Mississippi Cooperative of Extension, the POC instrument was utilized and a reliability coefficient of 0.89 was obtained and reported by Sadighi, Raven, and Taylor (1997).

A return rate of 81.42% was achieved for the study, after a second follow upon the participants. Examining the differences between early and late respondent, and between respondent and non-respondents, a method-1 of the procedures for handling nonresponse issues proposed by Lindner, Murphy, and Briers, (2001) was followed and found no statistically significant differences on dependent variables.

**Results and Discussion**

Findings will be presented and discussed for each objective.

**Objective One:** The majority of the participants (51.5%) had a Bachelor of Science degree while 23.4% of them carried an associate degree in agriculture and about 4.2% had a Master of Science degree in agriculture and the rest held a high school diploma. The respondents consisted of extension professional staffs stationed at city (50.6%), village (30.3%), and at provincial headquarter (19.1%) levels to carry out their assignment. About 91.1% of the respondents were male, which is consistent with national extension personnel’s gender ratio, and 91% of them were married. The mean age of respondents was about 38 years, their minimum and maximum age was 23 and 61 years, respectively. The respondents have had on average 13 years of work experience with the extension organization in the province. However, the majority of the staff (52.4%) had between 11 and 20 years of work experience.

**Objective Two:** The existing management system of the extension organization as perceived by respondents was computed to be a system-2, which is a Benevolent Authoritarian (BA) management structure. In a BA organization, the management and leadership styles practiced are more autocratic and motivation is based on extrinsic rather than intrinsic rewards. The desired management system as perceived by the professional staff (Table 1) was considered to be a system-4. System-4 is recognized to be a Participative Management (PM) organization, which is close to an ideal management structure. In a PM organization emphasizes on three key elements: manager's principle of supportive relationships, group decision making in an overlapping group structure, and manager's high performance goals for the organization. The findings of this study support the finding reported earlier by Sadighi, Raven, and Taylor (1997) and consistent with Likert (1979) assertion that most organizations are in system-2.
and that most professionals would desire a system-4 management system. Based on the finding of this study, it could be argued that a change in the provincial extension management structure from a system-2 to a system-4 would face no resistance because almost all-professional staffs favored a system-4 management system. However, the process of change is time consuming, and occurs on a very slow pace in Iran. In a similar context, Binswanger and Ruttan (1978) reviewed some historical precedence and pointed to the structural nature of government organizations as the main reason for the slow pace, particularly, when changes aim management and leadership structure within an organization.

Table 1

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<thead>
<tr>
<th>Variable</th>
<th>Sample</th>
<th>Mean</th>
<th>SD</th>
<th>Converted System*</th>
<th>Management Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Management</td>
<td>171</td>
<td>8.89</td>
<td>3.09</td>
<td>2.47</td>
<td>2</td>
</tr>
<tr>
<td>Desired Management</td>
<td>171</td>
<td>15.27</td>
<td>2.78</td>
<td>3.55</td>
<td>4</td>
</tr>
</tbody>
</table>

*Sys=(Mean Management Score) 4/20+0.5

Objective Three: The extension professional staffs’ attitude toward PTD was measured on the basis of their willingness to participate with farmers, researchers and other rural development agents on activities listed on Table 2. These activities are operationally defined as essential for participatory technology development. Their collective attitude toward PTD main activities as shown in Table 2 indicates that the extension staffs highly favor the adoption and implementation of PTD in their activities as they relate to innovation and technology development.

Table 2

<table>
<thead>
<tr>
<th>Staffs’ Attitude toward Participatory Technology Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willing to Participate with Farmers, Researchers, and Rural Development Agents in:</td>
</tr>
<tr>
<td>1. Gathering Needed Data</td>
</tr>
<tr>
<td>2. Exchange of Information</td>
</tr>
<tr>
<td>3. Needs Assessment and Problem Analysis</td>
</tr>
<tr>
<td>4. Prioritizing Farmers’ Technical Problems</td>
</tr>
<tr>
<td>5. Assessing Farmers’ Technological Needs</td>
</tr>
<tr>
<td>6. Assessment of Farmers’ Indigenous Knowledge</td>
</tr>
<tr>
<td>7. Conducting Field Experiment</td>
</tr>
<tr>
<td>8. Planning for Extension Educational Programs</td>
</tr>
<tr>
<td>9. Publishing Extension Publications</td>
</tr>
<tr>
<td>Collective Attitude toward PTD</td>
</tr>
</tbody>
</table>

Not at All=0; Very Little=1; Little=2; Do not know=3; Much=4; and Very Much=5
Despite the respondents’ positive attitude toward PTD, the staffs’ level of involvement with PTD has been characterized as “week”. This is partly due to management and leadership style within the provincial extension organization that does not require and demand collaborative teamwork in a participatory manner. Extension scientists argue that traditional nature of a top-down technology transfer approach, which is dominant in Iran’s extension organizations, and other contextual factors are not conducive to implementation of a more participatory approach toward extension activities. Therefore, fundamental changes in organizational structure and management systems are required in order to have a suitable climate to adopt a more participatory approach in both operating extension organization, and providing services to farmers-clientele.

Objective Four: The result of a bivariate correlation test showed that age of the respondents has negative relationship with their attitude toward PTD. Similarly, there was a statistically significant and negative relationship between the staffs’ years of work experience in extension organization and their attitude toward PTD. These findings indicated that as the extension professional staffs get older, and their years of work experiences with the organization increases, their attitude toward PTD decreases.

So, in order to maintain and affect their attitude in a positive way, measures should be taken on a yearly and continuous basis to increase the staffs’ motivation, awareness, understanding, and their level of involvement with PTD.

In contrast to age and years spent with extension organization, the respondents’ level of education shown to have statistically significant and positive relation with their attitude toward PTD. Similarly, there was a statistically significant relationship between their attitude toward PTD and their level of participatory information obtained. This suggests the influence of information, knowledge and awareness regarding participatory approach on the respondents’ attitude toward PTD, which supports the assertion of other researchers (Groot, & Ling, 1999; Quamar, 2000; Youngman, & Maruautona, 1998) in this regard.

The management system of the extension organization showed to have a statistically significant relationship with the respondent’s attitude toward PTD. This suggests that a more participatory organizational climate and leadership style of extension organization could affect and encourage favorable attitude toward PTD. Table 4 shows a more detail relationship between respondents’ attitude toward PTD and their independent variables.

### Table 3

<table>
<thead>
<tr>
<th>Attitude Characterization</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>11</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Relatively Negative</td>
<td>12</td>
<td>7.05</td>
<td>13.55</td>
</tr>
<tr>
<td>Relatively Positive</td>
<td>100</td>
<td>58.82</td>
<td>72.37</td>
</tr>
<tr>
<td>Positive</td>
<td>47</td>
<td>27.64</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>170</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**The Extension Professional Staff Attitude toward PTD**
Table 4

**Correlation between the Staff’s Attitude toward PTD and their Professional Characteristics**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Attitude toward Participatory Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>r</td>
</tr>
<tr>
<td>Age (year)</td>
<td>-0.138</td>
</tr>
<tr>
<td>Education (year)</td>
<td>0.180*</td>
</tr>
<tr>
<td>Years of Experience</td>
<td>-0.183*</td>
</tr>
<tr>
<td>Level of Participatory Information Obtained</td>
<td>0.184*</td>
</tr>
<tr>
<td>Level of Participatory Experience with Farmers</td>
<td>0.130</td>
</tr>
<tr>
<td>Level of Participatory Experience with Researchers</td>
<td>0.046</td>
</tr>
<tr>
<td>Level of Involvement in Participatory Approach</td>
<td>0.223**</td>
</tr>
<tr>
<td>Management System Perceived</td>
<td>0.162*</td>
</tr>
</tbody>
</table>

**Objective Five**: The independent variables with interval data were used in multivariate linear regression which included participants’ age, level of education, years of work experience, level of participatory experience with farmers and researchers, level of participatory information obtained, extend of individual involvement with participatory approach, and management system of the organization. Utilizing Backward Elimination method, the extent of individual involvement with participatory approach was the only variable remained in the regression equation and other variables were eliminated. Table 5 shows details of the Multivariate Regression Analysis.

Table 5

**Multivariate Regression Analysis (Attitude toward PTD as Dependent Variable)**

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>Constant</td>
<td>3.85</td>
<td>0.125</td>
</tr>
<tr>
<td>Level of Involvement in Participatory Approach (X1)</td>
<td>0.318</td>
<td>0.103</td>
</tr>
</tbody>
</table>

\[ R^2 = 0.076 \]

The result of the multivariate linear regression indicated that 7.6% \((R^2 = 0.076)\) of the variance in respondents’ attitude toward PTD could be explained by their level of individual involvement with participatory approach. This implied that there are other factors that may have contributed substantially to variations in the professional staffs’ attitude toward PTD that were not investigated in this study. The regression analysis provides variable with statistically significant level (as shown in table 5), so the following predication equation was formulated to estimate the professional staffs’ attitude toward PTD.

\[ Y = 3.85 + 0.318 (X1) \]

\( Y \) = Extension Professional Staff’s Attitude toward PTD.

**Conclusions**

The main challenge for extension organizations in Iran has been to develop strategies for optimum involvement of the eventual users of technology in the entire process. In this respect, various participatory approaches have been tried in recent years with varying results. Attempts to apply PTD principles encountered number of difficulties and criticisms. Despite the challenges, scientists observed that favorable attitude of extensionist and researchers are essential and necessary for adopting PTD. In addition, researchers argued that institutional factors and various other contextual variables could affect the success of any participatory approach in extension organizations (Youngman, & Maruatona, 1998).
The result showed that the majority of the respondents’ attitude toward PTD is characterized as “positive”. Despite this, the staff’s level of involvement with PTD has been characterized as “weak”. This is partly due to the organizational management that does not require collaborative teamwork in a participatory manner. Extension scientists argue that fundamental changes in organizational management systems are required in order to have a conducive environment for the implementation of a participatory approach. The finding of this study also indicated that 7.6% (R²=0.076) of the variance in respondents’ attitude toward PTD could be explained by their level of individual involvement with participatory approach. This implied that substantial amount of variance in respondents’ attitude are explained by other variables that have not been investigated in this study.

The finding indicated that the existing management system of the extension organization as perceived by the respondents was a Benevolent Authoritarian management structure. But they desired a Participative Management organization. Therefore, the process of change toward a participatory management system (from a System-2 to a System-4) has a great potential to succeed, because it would face little or no resistance. The result indicated that the management system of the extension organization affect the participant attitude toward PTD. A bivariate correlation analysis showed a positive and statistically significant relationship between these two variables.

Educational Importance

Modern agriculture requires an innovative capacity which goes far beyond the individual farmer, researcher, industrialist, trader or adviser, and even beyond the abilities of any one of their organizations or institutions. The challenge is to develop strategies and approaches for optimum involvement of extensionists, researchers, development agents, and the eventual users of the technology in the entire process, starting from the identification of a field problem to the actual generation of the possible solution. To face this challenge, it must be realized that all parties involved should work as a unified body in order to be effective. PTD represents an opportunity to build better linkages between the various actors and to increase the learning from each other. When PTD and other participatory approaches are used, extensionists and researchers have the opportunity to work together with farmers on the same team. They exchange knowledge and experiences and reach some consensus with farmers on what is most needed. As a result, all parties come closer together. Farmers become more confident that professionals can help them, without imposing solutions on them. Agricultural extension function through a participatory approach has a great potential to play a key role in a national, long-range agricultural and rural development programs.

References


Extension Domains among Urban Farmers in Atteridgeville (Pretoria, South Africa)

Mmakolwane J. Maswikaneng, M Tech Student  
Wim Van Averbeke, Professor  
Reinald Böhringer, Principal Lecturer  
Centre for Organic and Smallholder Agriculture (COSA)  
Department of Agricultural Management  
Elsa Albertse, Professor  
Institute of Life Sciences  
Technikon Pretoria, South Africa


Abstract
The article identifies and defines three extension domains among urban farmers in the informal settlements of Atteridgeville. These consist of home gardeners, community-project gardeners, and users of open urban spaces. The extension domains are defined in terms of type of space used for farming, choice of crops and related production practices, access to resources, and the socio-economic characteristics and important agricultural needs of farmers. This information was obtained by means of a survey (n=120) involving face-to-face interviews and a structured interview schedule. The survey was complemented by semi-structured interviews and observations of agricultural activities. The paper concludes by calling for closer involvement of government and public extension in urban agriculture in the study area, because urban farming mainly benefits the poor. Specific constraints, which extension services may help to address, are identified for each of the three extension domains.

Introduction
The United Nations Development Programme (1996) defined urban agriculture as an industry that produces, processes and markets food and fuel, largely in response to daily demand of consumers within a town, city or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods using and reusing natural resources and urban wastes to yield a diversity of crops and livestock. During the 1980s, the importance of urban agriculture accelerated dramatically throughout the world (United Nation Development Programme, 1996). Apparently, this was in response to declining purchasing power and increasing levels of poverty among urban populations (Chaipa & King, 1998). In South Africa, the importance of urban agriculture has also been on the rise. It has developed into one of the ways in which urban dwellers supplement their low incomes (May and Rogerson, 1995 and Rogerson, 1998). Research on urban farming in South Africa showed the majority of urban gardeners to be female (Meadows, 2000; Martin, Oudwater and Meadows, 2000). Generally, they engaged in agriculture to save on household food expenditure, and to generate income through sales of surplus produce. Many South African NGOs and welfare organisations have recognised the importance of small-scale urban agriculture in terms of food security and social function. They promote gardening activities through extension, training and occasional supply of seeds and fertilizers. Town planners and policy makers in South Africa tend to view urban agriculture as a way of prompting economic development. As a result, they favour highly organised intensive production systems (Martin, Oudwater and Meadows, 2000). According to Meadows (2000), this narrow view of urban agriculture may explain the general absence of governmental support to urban farming in South Africa.

In order to provide an efficient and effective support service to a particular group of farmers, their needs, problems, and circumstances must be known and understood (Bembridge, 1991). This knowledge and understanding may be used to identify and define one or more extension domains among the group of farmers being considered. Extension domains are homogenous groups of farmers, who share the same problems, and
possess similar resources for solving these problems (Low, 1986).

**Purpose and Objective**
The objective of the present study was to define and identify extension domains among urban farmers in the informal settlements of Atteridgeville (Pretoria), and the purpose was to encourage various extension support systems to increase and broaden their involvement in urban farming by contributing to the body of knowledge on this sector.

**Materials and Methods**
The study area. The study was conducted in the informal urban settlements of Jefsville, Phomolong, Concern, Vergenoeg, and Brazzaville found along the southern edge of Atteridgeville. This formal African township is situated approximately 19 km west of the centre of Pretoria, the capital of South Africa (see Figure 1). The informal settlements of Atteridgeville came into existence in 1990 on land previously owned by the South African Defence Force (Theron, 2000). During establishment of these settlements, the provision of infrastructure was largely ignored.

*Figure 1.* Location of the informal settlements (study area) of Atteridgeville south of the formal part of that township (A) in the Gauteng Province (B) of South Africa (C).
At the time of survey, roads still consisted of tracks, there was no electricity, and water supply was by means of a limited number of communal standpipes. The residential plots tended to be small, ranging in size between 100 m² and 400 m². The houses consisted mostly of shacks built from plastic, wood, cardboard, and corrugated iron. There were no sanitary facilities inside the houses, forcing residents to make use of outside pit latrines.

Collection and analysis of data. Data were collected from August to October 2001, by means of a survey. The survey employed face-to-face interviews, which followed a structured interview schedule. A multistage cluster sampling procedure was adopted for the selection of the sample. Aerial photographs taken on the 4th September 1999, on a scale of 1:4 000, were used to count the number of residences (sampling frame), and to delineate 114 primary neighbourhood clusters. These consisted of approximately 100 residences each. From these clusters 12 were selected randomly. Systematic sampling was applied to identify 10 residences within each of the 12 primary clusters. This yielded a total sample of 120 residences, which represented a 1% sample of the total population of 11 400 residences. The interviews sought data on demography, income and expenditure, agriculture and life history of households occupying these residences. The survey data obtained were captured using Microsoft Excel spreadsheets. The Statistical Analysis Software (SAS®) version 8.01, statistical package was used to analyse the data (SAS® Institute Inc, 2000). Additional information was obtained by means of semi-structured interviews and observations of agricultural production activities. In the study a household was defined as consisting of all persons who usually ate and slept together, and who shared the same bundle of incomes. Households were classified into three income categories, namely, ultra poor, poor and non-poor. Adult equivalent was used as the unit of comparison to remove effects of household size and the age of the household members on the cost of meeting basic needs. The number of adult equivalents (AE) in a household was determined using the formula proposed by May (1996), namely,

\[ AE = (A + \frac{1}{2} C)^{0.9}, \]

whereby
AE = number of adult equivalents in the household;
A = number of adults in the household (household members aged 15 or older); and
C = number of children in the household (household members younger than 15 years old).

In 1999, the monthly Household Subsistence Level (HSL) for a family consisting of two adults and three children living in Pretoria was R1705.64 (Potgieter, 1999). The monetary value of this limit was adjusted to the time of the survey using the consumer price index supplied by Statistics SA (2001). This monetary value was then converted to an adult equivalent value, which at the time of the survey amounted to R553.03 per month. Adult equivalent income (AEI) of a household was calculated by dividing total household income in cash and kind by the number of adult equivalents in the household. Households with adult equivalent incomes higher than the HSL of R553.03 were categorised as not poor. Those with adult equivalent income lower than the HSL were classified as poor. The category of the poor was subdivided further into poor and ultra-poor. The adult equivalent income of R276.51 month⁻¹ (half the HSL) separated these two subcategories. During the survey, respondents reported crop yields using a variety of units. The method described by Van Averbeke and Mei (1998) was used to convert yields into monetary values, enabling analysis and comparison.

Results and Discussion

General socio-economic characteristics of the study population. Combined, the 120 households that were surveyed counted 532 members, yielding a mean household size of about 5 persons. Of these, 47% were male, 53% female, and 65% formed part of the economically active category of the population, aged between 15 and 64 years old. Nearly all the others (31%) were children. Of the active population, 43% were unemployed (actively looking for work), and 60% of the unemployed were women. More than half of the households in the sample (54%) were engaged in urban farming. On average, farming households tended to be slightly larger (5 members) than non-farming households (4 members). Heads of farming households were 6 years older than
those of non-farming households. In both categories the gender of the head was male in four out of five cases. The marital status of the heads of households in both categories was also similar. In farming households, 65% were married, 29% single, and 6% widowed or divorced. In non-farming households 64% were married, 32% single and 4% widowed or divorced. In both groups the majority of heads of household had at least eight years of formal education.

A comparison of the origin of farming and non-farming households yielded differences that were statistically significant (P = 0.02). The origin of non-farming households was more likely to be urban than among farming households, who were nearly all (94%) first-generation immigrants from rural areas. They had arrived in Atteridgeville to look for work or to join their spouses or parents who had migrated to the city. The rural origin of urban farmers was consistent with the finding reported by Van den Heever, Venter, Maphanga, Magoro, Kekana & Van Rooyen (1998). Consequently, it was not surprising that most farmers in the sample obtained their agricultural experience whilst still living in rural environments.

In both farming and non-farming households, income was derived mainly from salaries and wages. State transfers in the form of old-age pensions, disability grants and child support grants were the second most important source of income. Together these two sources supplied 81% of the income of households in the sample. Farming and non-farming households differed significantly in terms of the employment status of the ‘woman of the house’ (P<0.05), who was either the female head, or the spouse of the male head. Their unemployment rates were significantly higher among farming households (72%) than among non-farming households (57%). There was also a significant difference (P<0.05) between the two groups in terms of the income of the male head of household. This income was higher among farming households (R1 475 month\(^{-1}\)) than among non-farming households (R1 025 month\(^{-1}\)). The degree of poverty among households in Atteridgeville was considerable. The majority (58%) of the households in the sample were categorised as poor, 8% were ultra poor, and only about 33% were not poor. Although engagement in farming was proportionally most common among the ultra poor (63%), and least among the non-poor (45%), the differences in the relative frequency of farming among the three poverty categories were not statistically significant. Among the categories of household expenditure, food was the most important (Figure 2).

![Figure 2](image-url)

*Figure 2.* Relationship between adult equivalent income per month and the total proportion of total income spent on food among households in the informal urban settlements of Atteridgeville, Pretoria (September, 2001, n=120, R1.00 = US$0.10).
Among the poorest households, up to 71% of expenditure was on food. Overall mean expenditure on food per adult equivalent amounted to about 40% of total income among both farming and non-farming households. As the adult equivalent income of households approached R1000, expenditure on food dropped to less than 25% of total.

Types of agricultural production and use of inputs. Urban farming in the informal urban settlements of Atteridgeville was limited to the production of crops and vegetables in home gardens, group-gardens, and open urban spaces. Vegetables were produced in home gardens, and also in community group-gardens, established on land assigned to schools, clinics and cemeteries. Crops were grown mainly in open urban spaces, such as roadsides, and private land, made available to the community by its owners. Production in open urban spaces was limited to summer. In terms of participation rate, farming in home gardens was by far the most important, being practiced by about 83% of urban farmers. About 12% of the urban farmers were growing crops on urban open spaces, and 5% participated in group-gardens. The average size of a home garden plot was 25.9 m², that of an open urban space was 350.9 m² per individual, and the area of community garden land was 195.7 m² per individual member (Table 1). The size range was narrow for all three types of plots. Crop selection by farmers was influenced by type of production. Home gardeners preferred maize, Swiss chard and onions. The main crop grown in urban open spaces was maize. In many cases it was intercropped with dry beans, pumpkins and melons. In gardening groups, the most commonly grown crops were beetroot, tomatoes, carrots, cabbages, green peppers and lettuce. On average, the productivity of urban agriculture in the study area, measured in monetary terms per unit area, was highest in home gardens (R1.58 m⁻²), followed by community gardens (R1.07 m⁻²) and open urban spaces (R0.61 m⁻²), as shown in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Type of space</th>
<th>Mean size of individual units (m²)</th>
<th>Size range of individual units (m²)</th>
<th>Mean monetary value of production per unit area (R m⁻²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home garden</td>
<td>25.9</td>
<td>8 – 70</td>
<td>1.58</td>
</tr>
<tr>
<td>Urban open space</td>
<td>350.9</td>
<td>180 – 560</td>
<td>0.61</td>
</tr>
<tr>
<td>Community garden</td>
<td>195.5</td>
<td>167 – 250</td>
<td>1.07</td>
</tr>
</tbody>
</table>

On average, urban farmers increased their household income by R70.11 per year, or R5.84 per month. Most of this income was in kind, because all the produce from home gardens and urban open spaces was consumed at home (Table 2). The main reason for the absence of sales by home gardeners and users of open urban spaces was that the quantities produced did not provide for a surplus. Sales of produce occurred only in community garden projects. This explains the particular crop selection characteristic of these projects.

Table 2

<table>
<thead>
<tr>
<th>Type of space used for agriculture</th>
<th>Value of produce (R)</th>
<th>Value of home consumption (R)</th>
<th>Value of gifts (R)</th>
<th>Value of sales (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home garden</td>
<td>41.11</td>
<td>41.11</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Urban open space</td>
<td>213.14</td>
<td>213.14</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Community garden</td>
<td>210.67</td>
<td>163.29</td>
<td>0.00</td>
<td>47.38</td>
</tr>
</tbody>
</table>
Water is an important input in urban agriculture (Lee-Smith and Lamba, 1991). In the study area, home gardeners used water from standpipes to irrigate their crops. This sometimes required water to be carried to the gardens in buckets or tins. In community gardens, farmers usually had access to water from taps, free of charge, enabling them to practise irrigation by means of hosepipes. Production in urban open spaces was entirely reliant on rain, which only falls during summer in the Pretoria region. The use of chemicals (fertilisers and pesticides) was largely limited to community garden projects, and even there it was not widespread. Besides seeds, which were often saved from the previous harvest, and the hiring of a tractor to prepare the land, users of urban open spaces did not use inputs. Home gardeners used organic household waste and crop residues to increase or maintain the fertility of their soils. Crop residues were also used. In all cases these were obtained from the farmers’ own gardens. About one in five home gardeners purchased seed from shops, and 45% used seeds from the previous harvest. The rest obtained them from relatives or friends. Tools used in home gardens and community gardens included hand hoes, spades, rakes, and forks.

Extension domains among urban farmers in the study area. Women did most of the farming in the study area. Of the 65 urban farmers in the sample, 86% were female and 14% male. In most cases (51 out of 65), it was the unemployed spouse of the male head who did all the farming. In a few cases (12) the male head assisted with preparation of the land. There were also 18 cases where children assisted their mother with watering and weeding during weekends and holidays. Urban farmers in the study area were categorized according to type of space used for agriculture. Important personal characteristics of farmers in the three categories are presented in Table 3.

Table 3
Selected socio-economic characteristics of farmers categorised according to the type of space they used for agriculture in the informal urban settlements of Atteridgeville (2001; n=65)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Home garden (n=54)</th>
<th>Urban open space (n=8)</th>
<th>Community garden (n=3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>42*</td>
<td>57*</td>
<td>53*</td>
</tr>
<tr>
<td>Female headed (%)</td>
<td>7*</td>
<td>63*</td>
<td>100*</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Employed (%)</td>
<td>17</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>- Unemployed (%)</td>
<td>72</td>
<td>37</td>
<td>67</td>
</tr>
<tr>
<td>- Pensioners (%)</td>
<td>11</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &lt; 4 years (%)</td>
<td>7*</td>
<td>38*</td>
<td>67*</td>
</tr>
<tr>
<td>- &gt;4 years (%)</td>
<td>93*</td>
<td>63*</td>
<td>33*</td>
</tr>
<tr>
<td>* Significant = p&lt;.05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Generally, the characteristics of home gardeners were different from those of farmers in the other two categories. Home gardeners were female, young, unemployed, relatively well educated, and part of male-headed households. They combined home gardening with their reproductive role in their households. Their main need was for improved access to water, both for domestic and agricultural purposes. Other needs included space-saving production techniques, such as vertical growing systems, and information on appropriate soil fertility and pest control management. Home gardeners constituted the first of three extension domains that were identified in the study area. In most cases they could be reached by means of written extension messages, because they were functionally literate. Community-project gardeners and users of open urban spaces had similar personal characteristics. Both groups consisted mainly of women older than 50 years, who were unemployed, poorly educated, and head of household. In both cases they used agriculture to supplement incomes derived mainly from state transfers. Despite their similar personal characteristics, the separation of
community-project gardeners and users of open urban spaces into two extension domains was necessary, because their production systems were so different. The main need of community gardeners was for improved security of tenure over the community-garden plots. They also expressed the need for a full range of appropriate production practices enabling increased productivity in irrigated vegetable production. In the case of users of open urban spaces, the main need was for appropriate soil fertility management and pest control practices for use in mixed summer cropping. Farmers in these two domains were usually not functionally literate, calling for ways of communication other than by means of written messages.

**Conclusions and Recommendations**

The results of the study showed that farming in the informal settlements of Atteridgeville was widespread, mainly for household consumption, and not very important in terms of its contribution to total household income. Urban farmers in the study area consisted mainly of unemployed women, who were usually poor, and who had gained some experience in agriculture before their arrival in the township from rural areas. Three extension domains were identified among urban farmers, namely home gardeners, community-project gardeners, and users of open urban spaces. Farmers in each of these domains had particular needs related to agriculture. Extension services need to consider the educational status of the farmers in of the groups when preparing information packages and educational materials, because differences were apparent. As in other urban centres in South Africa, growth in urban farming in the study area could benefit from closer involvement of government and public extension. At the time of this study their involvement was limited to a single group-garden project. The study showed that urban agriculture mainly benefited poor people. The relatively small material benefits derived from urban agriculture by participants should not be viewed as a reason for ignoring its overall importance. Van Averbeke and Mei (1998) pointed out that small-scale urban agriculture presented physical and social benefits also, especially to elderly people farming in a group context.

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**References**


Factors Associated with the Use of Pesticides in Uganda: Strategic Options for Targeting Integrated Pest Management (IPM) Programs

J. Mark Erbaugh and Joseph Donnemeyer
The Ohio State University

Samuel Kyamanywa
Makerere University


Abstract

Targeting particular groups who share similar production practices and problems has proven to be a cost-effective, efficient way to design and disseminate agricultural technologies. The accumulated evidence indicates that where successful, Integrated Pest Management (IPM) programs have been goal-oriented and targeted. Since one of the primary goals of IPM is to control pests while reducing the use of synthetic pesticides, knowledge of social, economic and institutional factors that influence farm-level decisions to adopt pesticides may suggest different targets and strategies for disseminating IPM. Using a multi-staged sampling procedure, two hundred farmers from two districts in Eastern Uganda were interviewed regarding their socioeconomic background and pest management practices. Regression results indicate the most important predictor of pesticide use was growing tomatoes, followed in order by owning a backpack sprayer, farming in Kumi district, a higher level of education and more contact with extension. These results suggest targeting specific crops and cropping environments associated with high pesticide use for IPM programs. Farmers owning backpack sprayers could be targeted for programs that integrate pesticide safety and information about IPM. Extension agents also need to be provided information about and trained in IPM. Alternative IPM approaches are recommended for farmers who are not using pesticides.

Introduction

Developing and disseminating appropriate technological solutions for different agricultural producers and production systems is vital to agricultural development in Sub-Saharan Africa (Venkatesan and Kampen, 1998; Cleaver, 1993). One unavoidable lesson over the past 50 years of agricultural research and development is that one-size does not fit all and that recommendations must be tailored to the needs of the end-user. Despite appearances of homogeneity, small farmers have different production practices, needs and constraints (Carr, 1989). Targeting particular groups who share similar production practices and problems has proven to be a cost-effective, efficient way to design and disseminate agricultural technologies (Rivera and Gustafson, 1991).

A market segment, or target, is a subgroup of people or organizations sharing one or more characteristics that cause them to have similar needs. The strategy is to identify different segments of a program’s potential adopters and to develop a priority ordering of segments which maximize the accomplishment of the program’s objectives (Roberto, 1972). Both commercial firms and many national agricultural research and extension organizations have used targeting. In the Farming Systems Research literature, targets are designated as domains that consist of farmers who share similar production practices and circumstances (Ruthenberg, 1980). Past extension strategies targeted innovative or progressive farmers, however, these approaches fell out of favor because they benefited elites and exacerbated rural socio-economic inequality. Participatory agricultural research and extension approaches attempted to counter this bias by advocating that resource poor farmers and disadvantaged groups, such as women or minority ethnic groups, be specifically targeted.

For over two decades, attempts have been made to develop and disseminate Integrated Pest Management (IPM) strategies to small farmers in sub-Saharan Africa and around the world. IPM is touted as a cost effective, environmentally friendly, and sustainable
strategy for small-scale farmers. Yet, these efforts have met with limited success, particularly among small farmers (Yudelman et al., 1998; Morse & Buhler, 1997). A one-size-fits-all approach to the dissemination of IPM may have underestimated small farmer heterogeneity and impeded its adoption. To improve the adoption of IPM, it may be important to differentiate the demand/need for IPM, as suggested by the marketing concept of targeting (Maxwell, 1996; Morse & Buhler, 1997).

One of the primary goals of IPM is to control destructive pests and diseases while simultaneously eliminating or reducing the use of synthetic pesticides. Previous studies have indicated that more intensive use of pesticides is often associated with greater knowledge and awareness of non-chemical control strategies such as IPM (Erbaugh et al., 2001; Morse and Buhler, 1997). Research in the diffusion of agricultural innovations has demonstrated that knowledge/awareness of a new technology is a necessary first step in the adoption decision-making process (Rogers, 1995). This line of research also indicates that adoption behavior in the past is often a useful indicator for predicting future technology adoption (Hooks et al., 1983). Thus, factors associated with pesticide use may suggest potential targets for IPM programs.

Objectives
The main objectives of this study are: 1) to identify factors associated with pesticide use; and, 2) to use this knowledge to suggest different targets and strategies for disseminating IPM.

Factors associated with pesticide use: A basic premise of the traditional diffusion model is that adoption behavior is influenced by personal background characteristics, or human capital, such as experience or its proxy age, and level of education (Feder, 1985). Gender is another important background characteristic particularly in sub-Saharan Africa that affects access to information and influences adoption decisions (Saito et al., 1994). Critics of the diffusion model suggest that access to information and the capacity to act on this information was limited by economic constraints (Hooks et al., 1983; Feder, 1985). Thus, the differential possession of economic assets such as land, labor and capital were more important predictors of technology adoption than human capital. Others have argued, particularly in the case of agricultural technologies, that individuals with greater access to information will be more likely to adopt new technologies (World Bank, 1991; Padel, 2001). Contact with agricultural extension agents measures a farmer’s access to information. Distance from the farm homestead to the nearest town measures geographical access to input markets and agricultural information.

Rogers (1995) indicates that innovations more compatible with existing modes of production will be more readily adopted. Ashby (1982) argues that the adoption of agricultural technologies can often be explained by their suitability for specific crops and environments. In fact, there is substantial evidence linking production goals with production practices including pest management (Seckler, 1993; Ruthenberg, 1990). In Kumi District, farmers have had more experience with pesticides owing to their long history of growing cotton commercially. Finally, complementary technologies can facilitate adoption of other technologies (Feder, 1985). Owning a backpack sprayer will facilitate frequent and efficient application of pesticides.

Methodology
A multi-staged sampling procedure was used to select eight villages in two districts in Eastern Uganda. In each district, four sub-counties and one village in each sub-county were randomly selected. Household lists were obtained for each village from government officials. A systematic random sample of 25 farmers was selected from each village, totaling 100 interviews from each district, and 200 interviews in all.

The survey instrument was based on a previous version used to study socioeconomic background characteristics and pest management practices of farmers in the same districts in 1996. Field enumerators were selected from local extension staffs based on their familiarity with local languages and survey methodology. Female enumerators, two for each district, were instructed to interview female farmers knowledgeable of the farm operation when possible. A one-day training workshop for enumerators was held, and teams of enumerators conducted a pre-test of the instrument with five farmers in their respective districts. Each enumerator completed 25 questionnaires through personal interviews.
The dependent variable, pesticide usage, was measured by asking farmers to name crops they had sprayed and the different pesticides used on each crop. This measure was considered to provide a more reliable approximation of pesticide usage per farmer than the number of spray events per crop per season because most small-scale farmers in Uganda do not maintain records on pesticide rates or application frequency. Without records several commonly reported farmer practices, including applying pesticides frequently at lower than recommended rates; applying less frequently at higher than recommended rates; and making pesticide cocktails by mixing several pesticides together, rendered estimates of pesticide rate and application frequency unreliable. Although both responses relied upon farmer recall of information, most were able to recall if they had sprayed a crop or not, and if they had used one or more different pesticides. In several cases where they were unable to recall the name of the specific pesticide used, they were able to retrieve a bag or container with the name of the pesticide on it from the household or storage area.

Independent variables were selected from previous studies on the adoption of agricultural technologies and their potential influence on the adoption of synthetic pesticides. Since markets can be segmented using a single or several variables, these were then grouped into explanatory sets or blocks of factors to facilitate assessing their effectiveness as potential targets for future IPM programs.

Findings

Table 1 shows the characteristics of the respondents from Iganga and Kumi districts. The mean response pattern on educational level, crop acreage, and age was similar to data gathered from the last National Census in 1992. The average age was 40 years old. There were slightly more female than male respondents, probably because “head-of-household” was intentionally not used as a screening question so that female agricultural decision-makers (52%) had a better chance of being represented in the sample. Average education was nearly seven years, which is equal to the number of years required for a primary leaving certificate. Crop acreage was slightly higher in this sample because farm size in Kumi district tends to be larger than the national average. Farm income averaged $100-$220 per annum, which approximates a World Bank study (1993) that found the average farm income in Uganda was $104 per annum.

Table 1

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pesticide Usage</td>
<td>1.56</td>
<td>1.63</td>
</tr>
<tr>
<td>Age</td>
<td>40.10</td>
<td>12.41</td>
</tr>
<tr>
<td>Educational level</td>
<td>6.83</td>
<td>3.27</td>
</tr>
<tr>
<td>Acres in Crops</td>
<td>5.68</td>
<td>4.90</td>
</tr>
<tr>
<td>Farm Income</td>
<td>3.07</td>
<td>1.73</td>
</tr>
<tr>
<td>Part time labor</td>
<td>2.13</td>
<td>1.75</td>
</tr>
<tr>
<td>Extension Contact</td>
<td>3.86</td>
<td>4.56</td>
</tr>
<tr>
<td>Town Distance</td>
<td>10.79</td>
<td>8.55</td>
</tr>
<tr>
<td>Commercial Acreage</td>
<td>41.46</td>
<td>18.63</td>
</tr>
<tr>
<td>Tomatoes growing</td>
<td>.14</td>
<td>.35</td>
</tr>
<tr>
<td>Tomatoes not growing</td>
<td>86%</td>
<td></td>
</tr>
<tr>
<td>District</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iganga</td>
<td>.50</td>
<td>.50</td>
</tr>
<tr>
<td>Kumi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Owning Sprayer owning</td>
<td>.16</td>
<td>.37</td>
</tr>
<tr>
<td>Owning Sprayer not owning</td>
<td>84%</td>
<td></td>
</tr>
</tbody>
</table>

The majority of farmers (63%) were applying at least one synthetic pesticide during the cropping season with over 25% of the respondents making three or more applications. Farmers in Kumi district used more pesticides than farmers in Iganga district. Women were as likely as men to have their fields sprayed; however, men were much more likely to do the actual application of pesticides. The most common method of applying pesticides was hiring someone to spray, borrowing a sprayer, or using ones’ own sprayer. In this sample 16% of the farmers owned their own backpack sprayer.

Pesticide use was regressed on five sets or blocks of variables presented in Table 2. In examining the block regression results, personal background variables explained only 5% of the variation in total pesticide usage. The only statistically significant predictor within this block was educational level, which showed a beta coefficient of .152. The second block of variables representing economic assets
explained 12% of the variance in pesticide usage and when combined with the first block of variables, explained 14% (+9% increase). None of the variables in this block were statistically significant.

By itself, the third block of information and market access variables, explained nearly 11% of the variance in total pesticide usage. The most important variable was extension contact, showing a beta coefficient of .129. However, when this block was combined with the first two blocks, it increased the variance explained by only 6%.

The fourth block consisted of three variables that were compatible with pesticide use. By itself this fourth block explained nearly 33.4% of the variance, and combined with the first three blocks of variables, accounted for 41.4% in pesticide use (+21.5%). The two statistically significant variables in this block were growing tomatoes and living in Kumi District.

The fifth block was a single variable: owning a backpack sprayer. By itself this variable explained 20.8% of the variance and increased the total explained variance by +9%. The total model was successful in explaining nearly 51% of the variance in pesticide use, indicating that it was moderately successful in identifying factors associated with farmers’ use of pesticides.

Table 2

<table>
<thead>
<tr>
<th>Variables</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Total Adjusted R²</th>
<th>Change in total Adjusted R²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td>.152**</td>
<td>.048</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>.045</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Economic Assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres in Crops</td>
<td>-.052</td>
<td>.122</td>
<td>.139</td>
<td>.091</td>
</tr>
<tr>
<td>Farm Income</td>
<td>.062</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hired Labor</td>
<td>.062</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact with Extension</td>
<td>.129*</td>
<td>.106</td>
<td>.199</td>
<td>.064</td>
</tr>
<tr>
<td>Distance from town</td>
<td>.099</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compatibility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial acreage</td>
<td>.078</td>
<td>.334</td>
<td>.414</td>
<td>.215</td>
</tr>
<tr>
<td>Tomato grower</td>
<td>.356**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>District</td>
<td>.313**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Complementary Technology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sprayer ownership</td>
<td>.316**</td>
<td>.208</td>
<td>.505</td>
<td>.091</td>
</tr>
</tbody>
</table>

** Significant = p<.01 – one-tailed test
* Significant = p<.05 – one-tailed test

**Discussion and Conclusions**

Regression results indicate that the independent variables included in the model explained the majority of variance in pesticide use. The most important predictor was growing tomatoes, followed in order by owning a backpack sprayer and farming in Kumi district. A higher level of education and more contact with extension were also moderately associated with more pesticide use. It appears that greater pesticide use is better explained by compatibility with particular crops and environments and by the possession of complementary technology. Also, higher levels of education and extension contact facilitate greater pesticide use, but economic barriers do not restrict pesticide adoption.

The second objective of this paper was to investigate whether factors associated with greater pesticide use suggest potential targets and strategies for diffusing IPM practices. The first strategy, justified by the explicit IPM goal
of lowering the use of synthetic pesticides, would specifically target pesticide users. There is evidence from a previous study in Uganda that pesticide user’s share a similar need to reduce pesticide usage (Erbaugh et al., 2001). Thus, farmers using more pesticides may be more interested in alternative pest management practices such as IPM than are farmers who are not using pesticides. Targeting specific crops and cropping environments associated with high pesticide use could further refine this strategy. Farmers in this sample clearly perceived that pesticides were required to grow tomatoes and were more frequently used with cropping systems in Kumi. Although not included in this study, greater pesticide use was also associated with growing cowpea. Thus, farmers growing these crops or living in Kumi might be more interested in alternative pest and disease management practices that allow them to reduce pesticide usage.

A component of IPM is using pesticides safely and effectively. Thus an accompanying strategy might target farmers who own backpack sprayers for programs that integrate pesticide safety with information about IPM. This information could accompany the technology where it is purchased or could form the core of an extension program. Since extension contact was associated with pesticide use, extension agents need to be trained in and provided with appropriate information on pesticide use, safety, and IPM.

Although IPM adoption may be facilitated by the strategy of targeting pesticide users, an unforeseen consequence may be the furthering of rural social and economic inequality. Evidence from this study appears to indicate that economically advantaged farmers are not more likely to be using pesticides. Thus targeting pesticide users for IPM programs should not advance rural inequality. However, an additional strategy would target farmers who are not using, or who are using low levels of pesticides. This approach would focus IPM research and development activities on longer-range approaches to crop and pest management. Since ecological IPM approaches are recognized as being knowledge intensive, approaches that maximize experiential learning opportunities, such as farmer field schools might be used. Thus, the IPM strategy used would depend on the target. If the goal of an IPM program is to reduce or eliminate the use of synthetic pesticides then differentiating the market for IPM according to pesticide use might prove to be a useful strategy for promoting IPM with different population segments.

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References


Farmer Field Schools and the Future of Agricultural Extension in Africa

Brent M. Simpson, Adjunct Faculty, Department of Resource Development
Michigan State University

Michelle Owens, Extension, Education, Communication and Training Officer
FAO Regional Office for Africa


Abstract

The continuing efforts to stimulate economic growth in Africa through agricultural development reflect the rise and fall of the different ‘fads and fashions’ in international development over the past 50 years. As the ‘poor cousin’ in most agricultural development strategies, agricultural extension and education has been particularly affected by the changing trends in external financing. Following the failure of rural development projects to significantly improve the welfare of the rural poor through the mid-1980s, the region witnessed a widespread abandonment of support for large-scale, state-run extension programs; the exception to this being the continued promotion of the Training & Visit (T&V) system by the World Bank. After pursuing alternative policies, such as the support of non-governmental organizations, the ‘invisible hand of the marketplace’ and, to a lesser extent, producer associations, a growing number of donors and governments have shown a renewed interest in once again backing state-sponsored agricultural extension programs.

Recently, interest has begun to coalesce around the potentials offered by the Farmer Field School (FFS) approach. Drawing upon field data collected from the two oldest FFS programs in Africa, this paper takes a brief look at the main elements in the FFS approach and its transfer to Africa. The results and conclusions center around six key issues: the responsiveness of the FFS approach to local conditions; FFS achievements in facilitating ‘systems learning’ on the part of farmers and supporting their increased involvement in knowledge generation; facilitation of farmer-to-farmer information exchange; local organizational development and the institutionalization of integrated pest and production management practices; positive impacts on the relationships between farmers, extension, and other stakeholders; and the specific challenges faced by extension in integrating the FFS approach into their programs. Some concluding observations are made on the progress, pitfalls, and potentials of the FFS approach to play a significant role in the revitalization of national extension programs within the region.

Introduction

Despite a renewal of donor interest in supporting national extension programs, a number of serious issues within the domain of extension practice remain to be addressed. While often masked under the new titles and phrases of the current development discourse, the challenges faced today reflect many of the perennial problems that have plagued development efforts over the past 50 years. These include, but are by no means limited to, the challenges of: becoming truly responsive to local conditions and concerns; facilitating constructive inter-organizational collaboration; fostering greater local self-reliance through individual capacity-building and local organizational development; addressing programmatic financial insecurity and low educational levels of extension staff; and engaging indigenous knowledge, farmer inventiveness and farmer-to-farmer communication. In the case of African agricultural extension, attention has increasingly turned towards a loosely defined collection of ‘participatory’ approaches, none of which have asserted themselves in any form of operational dominance. Recently, however, interest has begun to coalesce around the potentials offered by the Farmer Field School (FFS) approach, based upon its tremendous success among smallholding farmers in South and Southeast Asia. As a potential template to guide state agencies in building concrete participatory practices into their programs, the FFS approach is increasingly being considered for mainstream
extension practice in a growing number of African countries.

**Purpose**

The purpose of this paper is to provide an overview of the introduction of the FFS approach to Africa and, through use of case study material, to highlight some of the successes achieved and difficulties encountered in the expanding use of the approach. Following a brief look at some of the key elements in the FFS approach, and its transfer to Africa, the paper highlights six key issues outlined below. Some concluding observations are made on the progress, pitfalls, and potentials of the FFS approach to play a significant role in the revitalization of national extension programs within the region.

**Background**

**Asian Roots.** The Integrated Pest Management (IPM) FFS emerged out of a decade of experimentation in implementing participatory farmer training activities in the Philippines, beginning in the late 1970s. Refinements in the Philippine program and the launching of a major new effort in Indonesia in the late 1980s led to the birth of the FFS movement that has since spread across the region and around the world (Pontius et al., 2000). Conceptually, the FFS approach weaves together reinforcing elements of adult education, agroecology and local organizational development (Jiggins et al., forthcoming). The educational focus of the approach is perhaps its most distinct feature, and is described as reflecting the ‘experiential learning cycle’ proposed by Kolb (1984): concrete experience, observation and reflection, generalization and abstract conceptualization, and active experimentation. Operationally, the FFS are organized around a season-long series of weekly meetings focusing on biology, agronomic and management issues, where farmers conduct agroecosystem analysis, identify problems and then design, carry out and interpret field experiments using IPM – non-IPM comparisons. In addition, the FFS also include a significant focus on group and individual capacity-building. The longer-term empowerment goals of FFS seek to enable graduates to continue expanding their knowledge and helping others learn, and to organize activities within their communities to institutionalize IPM practices. During the 1990s, an estimated two million farmers were trained through the FFS in South and Southeast Asia (Pontius et al., 2000).

‘To Africa with Love’. Through the efforts of the FAO Global IPM Facility (GIF), the IPM FFS approach was first introduced in West Africa through a season-long training of trainers (TOT), and three associated FFS, held in 1995 in Ghana. Since the initial TOT, the Ghana program has continued to expand, both geographically and into new crops. With the establishment of a National IPM Secretariat and support from the Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTz), nearly 6,000 farmers and 400 extension agents have been trained through FFS in integrated production and pest management (IPPM) practices, covering over a dozen different crop species.

Following the efforts in Ghana, the first TOT and FFS were held in Mali in 1997. A National IPM Program was established in Mali in 1998, and in 1999 a major FFS effort on irrigated rice was launched in the Office du Niger (ON), Mali. Through the support of the Dutch government, a second TOT was held in 2000, this time focusing on training farmers who were to organize FFS in their villages in 2001, with technical support from local extension agents. As in the case of Ghana, there are national plans for an expansion of IPPM FFS activities into vegetable, cowpea and cotton production.

At the same time that programs in Ghana and Mali were taking shape, similar efforts were launched in several countries in East and southern Africa. To date, the FAO GIF has helped to start, or is currently working with pilot, FFS programs in over a dozen countries, from Senegal to South Africa. Several of these have moved beyond the pilot stage and are expanding their activities.

**Research Methods & Data Sources**

The information used in this paper is based largely upon field data collected during an institutional analysis of two of the oldest African IPPM programs, in Ghana and Mali (Simpson, 2001). Qualitative data collection methods were used, consisting of focus group and individual interviews with participating and non-participating farmers, as well as interviews with FFS Program Administrators and Field Staff, District Administrators, scientists, participating...
non-Governmental Organizations (NGO) and University Faculty. The first phase of the study was directed towards identifying and making contact with the principle organizations involved with the FFS. This was followed by a widening exploration into the relationships between these different stakeholders for evidence of changes in attitudes and behaviors regarding each other, the generation and exchange of IPPM knowledge and their perception of future possibilities.

In the case of Ghana, field visits were made to 11 FFS sites in urban, peri-urban and rural locations. Sites were selected in consultation with program staff for their relative strengths and weaknesses in terms of local organization development. In the case of the ON, Mali, visits were made to 6 of the 16 villages hosting FFS. Local extension staff members were asked to identify villages with ‘high’ levels of local organizational development, as well as those with ‘weak’ levels of development. In total, between the two countries, contacts were made with over 130 farmers, and more than 40 members of the different organizations.

Findings

Findings from the fieldwork are organized around the six key challenges facing extension programs, as mentioned above.

Relevancy and responsiveness of FFS to local concerns. One of the perennial stumbling blocks in African agricultural development has been the lack of relevancy of research themes and extension ‘messages’ to the majority of concerns faced by the continent’s smallholder farmers. Evidence from Ghana and Mali underlines the importance of this issue to the success of FFS activities. In the case of Ghana, the first IPM FFS targeted an irrigation perimeter where farmers were using pesticides, significantly raising the cost of production. During the first FFS, IPPM experimental plots produced a dramatic US$ 100 cost savings over existing farmers’ practices (Ketelaar et al., 1995). After subsequent FFS, reported adoption levels of basic IPPM practices reached 100% within the perimeter. The FFS on vegetables and plantains have also achieved notable success in terms of adoption rates of IPPM practices. These successes appear to be linked with two features: first, prior to holding FFS in new areas, program staffs have been able to identify viable solutions for at least some of the major local problems, through conducting pre-FFS agroecosystem analyses and technology validation trials.

Secondly, site-specific agroecosystem analyses are conducted, with FFS participants, to fine-tune the overall FFS agenda and to target local concerns and select promising technologies for subsequent experimentation. In instances where adequate attention has not been paid to ensuring local relevancy, the results have been predictable.

The strong relationship between desirable program impacts and attention to local conditions is even more apparent in the case of Mali. Historically, farmers in the ON have neither suffered from major pest problems, nor made significant use of pesticides. Although the FFS did attempt to focus on a broader range of non-pesticide resource management activities, it did so in a manner that caused the FFS experimental plots to require greater use of additional inputs and resulted in yields that were at best only marginally better (5%) (Nacro, 2000). Furthermore, many of the technical ‘solutions’ were tied to improved water management over which individual farmers had little control. Not surprisingly, none of the FFS farmers in the ON, while equally excited by the FFS process as those in Ghana, had adopted the new IPPM practices at the whole-field level.

Systems learning and the generation of new knowledge. The important distinction between the adult education and capacity-building goals of the FFS programs, and the more simplistic information diffusion objectives of most traditional extension programs, is immediately apparent in discussions with FFS graduates. When asked to identify the most significant areas of learning during the FFS, the widespread response from farmers in both programs was ‘the bugs.’ The focus on insect pest-plant and predator-prey interactions in the FFS offered farmers a truly novel window onto the life and death dramas unfolding within their fields, as well as insight into the role that insect ‘friends’ play in crop protection. Although most pronounced in the FFS on rice, farmers’ fascination with the study of insect population dynamics was widespread in the other FFS as well.

The second most frequently cited aspect was that of the season-long plant life cycle approach. In the case of FFS on rice, this approach allowed farmers to examine such things as the ability of plants to compensate for
vegetative loss, the timing of input application, and water management needs. These two areas – the dynamics of insect populations and plant ecology – constitute the major pedagogic themes of the IPPM FFS. The fact that the majority of farmers walked away from the FFS experience reporting these aspects as their most significant areas of learning is a major achievement of the FFS programs.

In addition to the acquisition of ‘systems-level’ knowledge, FFS participants, like farmers throughout the sub-region (e.g. Simpson, 1999), reported conducting a number of ‘experiments’ after the FFS were completed. The majority of these experiments involved adaptations and new uses of technologies learned through the FFS. The most consistent and striking examples occurred among participants in the FFS on vegetables, where certain management practices, such as the use of neem infusions and mulching, covered in the FFS on tomatoes and cabbages, were transferred to other vegetable crops. As would be expected of any experimental effort, many of these initial adaptations were later rejected. Nevertheless, the fact that farmers recognized the potential of ‘spillover’ and were attempting to capitalize on adapting the technologies to new incidents of practices is of major importance.

Farmers also described carrying out a wide range of additional experiments focused on refining techniques learned in the FFS, as well as developing new variants of IPPM technologies (e.g. different recipes of neem spray). Other than the subject matter of the experiments, however, the FFS did not appear to have a major impact on either the frequency of farmer experimentation, or the basic approach used in conducting experiments. Perhaps most striking is the fact that farmers were not able to relate what their FFS facilitators had discussed with them regarding continued experimentation upon completion of the formal FFS activities. In fact, farmers in all locations had difficulty in understanding what was meant by ‘experimentation,’ even with significant ‘coaching’ from the IPPM Master Trainers and facilitators who were providing the translation during the interviews. The idea of their potential role as knowledge generators, or how they could approach solving different problems, was clearly not well established.

Information flow and farmer-to-farmer communication. As with previous extension approaches, FFS relies heavily on the farmer-to-farmer spread of information to accelerate the diffusion of new ideas. During village visits in both Ghana and Mali, the reported levels of farmer-to-farmer communication of techniques learned through the FFS were very high. Farmer estimates of the number of secondary contacts that they had made outside of their immediate family members ranged from 10 to 20 and, in the case of one highly active woman plantain farmer, over 100 such contacts. The majority of contacts were informal, typically initiated by people from the same village who approached individual FFS participants out of curiosity, although in a few instances FFS graduates independently organized small group meetings. A number of participants mentioned giving unsolicited advice to neighboring farmers, although on the whole this was less common, and in one village farmers reported feeling constrained from ‘telling others what to do’ by village elders. A significant number of farmers reported establishing close, almost apprenticeship-type, relations with one or two other farmers. Both participating and non-participating farmers also reported evidence of non-verbal communication in the form of ‘copying’ certain management techniques.

In terms of the content of these exchanges, the majority focused on specific technologies or management practices. Communication among FFS participants, on the other hand, tended to focus on emergent problems, as well as the spread of second-generation technologies, such as alternative preparations of neem spray. The larger, systems-level concepts, such as interactions between insect populations and plant-soil-water interactions, were reported to be less often discussed, similar to findings in Asia (Rola et al., 2001). Anecdotal evidence suggests that even within the same family, these more holistic concepts may not be communicated. Such observations would seem to be supported by the fact that, despite the novelty and high level of interest in the insects discussed in the FFS, none of the farmers interviewed had continued to use the insect zoos after their ‘school’ activities had been completed. In fact, very few reported carrying out even informal insect scouting in their fields.
Institutionalization and Local Organizational Development. To achieve substantive and enduring impact, training in the FFS has explicitly focused on issues of local institutionalization, both in terms of changes in individual behaviors regarding IPPM practices, and in the development of supportive organizational structures. The impact of the FFS on local organizational development showed two general, yet very distinct, trends which were dependent upon whether or not the FFS were held in locations with any existing structures (cooperatives, village associations, producers groups, etc.) for meeting basic economic needs (Simpson, 2001). In contexts where there were no existing local structures, the FFS tended to serve as the spark among participants to mobilize capital and identify income-generating projects. In areas with existing local structures, the FFS tended to play a much more limited technical input role, with any formal FFS ‘group’ identity quickly disappearing.

In 8 of 11 sites in Ghana, where there were no existing local organizations, the FFS tended to lead directly to the formation of economic interest groups, which serve as vehicles for members to pursue development objectives. Having gained their initial cohesiveness through the group-building activities of the FFS training, these groups typically went on to establish their own bank accounts, starting with capital generated through the sale of produce from the FFS test plots, and moving on to the collection of monthly membership dues.

Although the major share of the activities pursued by these groups was motivated by economic self-interest, some benefits did spill-over to the larger community. Examples include the clearing of bush around the village, contributions made to the construction of schools, and plans for the repair of local roads. Except for newly formed groups (often times still involved in formal FFS activities), the discussion of IPPM related issues is not reported as a strong area of activity within these groups.

The second trend, observed in five of the six sites visited in Mali, as well as three of the locations in Ghana, involved FFS held in sites with some type of pre-existing, local-level, organizational structure. In introducing the FFS to these localities, no apparent effort was made to work with or through the existing organizations, nor were the IPPM agendas of the FFS later absorbed into the concerns of the larger organizations. Irrespective of their specific context and histories, the important observation related to these different organizations is that they tended to meet many of the major needs for local action among their members. As a result, there was little organizational impact of the IPPM FFS in these locations. In only two instances did FFS participants report having had more than two meetings since the completion of their field school.

Changes in Relationships. One of the hopes of the FFS approach is that the field schools will serve as a platform for improved exchanges and more constructive relationships between farmers, extension agents, researchers, and other stakeholders. In both Ghana and Mali, farmers reported that their opinions of extension had change significantly through the FFS. By the end of the FFS, most farmers felt that they could not only ask extension agents questions, but, more importantly, that extension agents were perceived as having something useful to offer. The majority of extension agents also made positive reference to this new approach to working with farmers.

Despite these positive changes in farmer-extension relations, vestiges of the former Training & Visit (T&V) systems used in both countries were still evident in the behaviors of individual field agents. A number of agents continue to relate their current activities within the FFS using core T&V concepts and terminologies. More than indicating a simple linguistic artifact, program staff suggested that these references hint at the persistence of top-down attitudes held over from the T&V period. Interestingly, in Mali, farmers still expect extension agents to make repeated visits to ‘reinforce’ and ‘consolidate’ the teachings of the FFS, à la T&V, because that is what extension agents have always done.

The vastly different organizational contexts within the two countries have greatly influenced the individual character of their inter-organizational alliances. One of the key relationships, at least in terms of potential, is that between research-extension. In Mali, researchers were broadly integrated into the planning and implementation of the initial round of TOT. In the Ghana program, researcher participation has been inconsistent, with some researchers becoming quite resentful of their
treatment in the training program. Despite the differing levels of involvement in training, the degree of post-TOT contact between researchers and farmer participants in the FFS has remained virtually nil in both countries. The inertia of existing research agendas, crushing organizational demands and uncertain pay-offs of engaging in unfocused FFS-based activities were cited as reasons for this outcome. The relationship between national FFS efforts and NGOs showed a similar pattern of differences and similarities between the two cases. In the Ghana program, explicit efforts have been undertaken to forge partnerships between the national IPPM program and representatives of a federation of NGOs. However, only one of these partnerships appears to have taken hold. In the case of Mali, no efforts have been made to date to build partnerships with NGOs, although it is uncertain whether suitable partner organizations exist. The result in both of the countries is that the IPPM FFS efforts are essentially government-sponsored and run activities, and will probably remain so well into the future. Perhaps more significantly, there is little evidence to suggest that the FFS have contributed to the emergence of ‘learning communities’ that bring together farmers, extension agents, researchers and others.

The most fruitful area of inter-organizational collaboration appears to be between the IPPM programs and other governmental structures and projects. The best examples to date are those that have been stimulated by the interaction between the GTz IPPM project and various stakeholders in Ghana. The project has helped to initiate a national crop protection policy dialogue (PPRS, 2000). In another instance, collaboration was initiated with the tertiary education program for extension agents, being offered through the University of Cape Coast, where course material was developed on the principles and practice of participatory technology development, including elements of the FFS approach (Owens et al., 2001). Perhaps the important feature of these examples is that they have not blindly followed a general call for ‘greater collaboration and coordination’ but have identified and pursued specific opportunities building upon common interests and secondary resources.

The integration of FFS into existing programs. The operational integration of the FFS approach into the existing extension programs in both countries has created a number of additional challenges. Interviews with extension staff in Ghana revealed a trend towards the use of an implicit, farmer-to-farmer extension strategy, as well as a major emphasis on local group formation. Although each offers significant promise, in neither instance do current practices show evidence of being based upon an explicit plan. There has been no apparent assessment of the suitability of the TOT in preparing field agents to implement these activities, the requirements for program support, possible follow-on activities, or the potential synergism or conflicts that might exist with other on-going activities.

There also appears to be a growing concern among program staff in both countries over the ability of the TOT to effectively alter the behavior of field agents. In both Ghana and Mali, the weakness in farmers’ understanding of and involvement in experimentation was attributed by program staff to the weak educational backgrounds of field staff, and engrained patterns of ‘service delivery’ behavior acquired during the previous period of T&V programs. This view is echoed by the leader of the GTz-supported project in Ghana, who observed that the level of experimentation among farmers appears to be more a result of the influence of the local extension officer than the FFS process itself.

Critics (Quizon et al. 2000) have increasingly mentioned the issue of financial burden of implementing FFS programs. Although the calculation of training costs is rife with difficulties, estimates of costs per farmer for FFS training in several East African programs vary between US$ 9-35, depending on whether extension agents or farmer facilitators are used (Dragon, 2001). Innovations such as the use of a decentralized FFS approach in Ghana that have reduced cost levels to US$ 8-10 per farmer, and a self-financing FFS model in Tanzania (FAO, 2002), provide further options for reducing costs. This route is already being explored in ON, Mali, where two-person farmer facilitator teams are now leading FFS.

Conclusions

Given the historical dearth of positive impacts from traditional service delivery approaches to agricultural extension in Africa, the FFS approach offers a much needed breath of fresh air and hope for the future. While
certainly no silver bullet, with the appropriate care the FFS approach has shown that it is capable of being highly responsive to local needs over a wide range of conditions, and with a wide range of crops. The approach has also made significant strides in providing the opportunity for farmers to acquire an understanding of important ‘systems’ concepts and relationships. FFS ‘graduates’ have proven to be willing and able to communicate viable, new IPPM technologies to others in their immediate localities and beyond, and in some cases have made significant contributions to local social development. Enough evidence is beginning to emerge to give hope that, with time, even the fiscal challenges may be overcome.

After decades of stagnation, one of the most uplifting findings is that of the capacity of the FFS experience to bring a sense of real vitality into the interactions between extensionists and farmers. This is perhaps best illustrated through the example of Ghana, where District extension directors are increasingly investing their limited budgetary resources in providing FFS training for their field staff because they believe that, among the choices available, it offers the best potential for generating positive impacts among farmers. The additional knowledge and new attitudes being brought to the field by those extension agents participating in the tertiary education program in Ghana hold the promise of yielding even more substantive changes, and deserves to be watched closely in the years to come.

The bright examples of success shown by the FFS are not without its shadows. If close attention is not paid, the focus and relevancy of the FFS is not necessarily any greater than a more traditional delivery-oriented program. The lack of broad diffusion of the core ‘systems’ concepts and relationships, around which the IPPM FFS are structured, is troubling. So, too, is the low level of farmers’ self-awareness and actualization, in terms of their real and possible roles in knowledge generation. As suspected by extension program leaders, this latter failure may be closely linked with the education levels and training of field agents – an obstacle that may not be surmountable in a single, season-long TOT. In addition to these possible weaknesses, the ingrained attitudes and patterns of behavior acquired under a decade or more of T&V implementation lay close to the surface, and without continued support to the contrary, may begin to reassert themselves and eat away at the initial gains in improved interpersonal farmer-extensionist relations. There is a chance, too, that the FFS may develop an ‘elite’ bias, favoring those who are literate and numerate, and leaving out the often majority of illiterate farmers. Already the content of the FFS is based almost entirely on perceptions and knowledge of ‘western’ science. Those that have the most experience with these views and who have the skills to utilize the printed mediums in which this knowledge is stored have a distinct advantage, to say nothing of the fact that much may be lost in ignoring the accumulated local knowledge.

Perhaps the area with the greatest need, and potential, for improvement is that of local institutionalization. The process of institutionalization, as the enduring change in shared patterns of belief, expectations and relationships, is the key to many of the other issues already mentioned. Ensuring continued relevancy, establishing greater local involvement in knowledge generation, establishing a means through which more broad-based, intra- and inter-group sharing of knowledge and experience can be achieved, sustaining improved relationships with outside stakeholder groups – all are issues that could benefit from a higher degree of integrated planning and a more concrete grounding of the FFS in community-level social interaction. Of particular importance will be an explicit effort to establish an identity for, and build a functional relationship between, the FFS and the communities in which they are held. The potential power of engaging the social capital of existing, viable local organizations, found in many of the region’s communities, must not be overlooked. In the long run, the magnitude of the benefits emanating from the FFS and its ability to become an institutionalized local source of information and community problem solving (e.g. Braun et al., 2000) will be closely tied to their establishing a greater, enduring social presence in communities where schools are held. Capturing these potentials, however, will require a fundamental change of how FFS are perceived, from the current notion of ‘schools without walls,’ to a more institutionally enlightened view of ‘schools that never close.’

The encouraging performance of the FFS to date, and the fact that those areas of
greatest weakness have possible solutions, is a source of much hope for the future of FFS in improving agricultural extension in Africa. If FFS programs can maintain their vigilance in avoiding the deadening effects of rote implementation, recognize and respond to areas of weakness, and capitalize on the full potentials of the dynamic adult education and capacity-building themes embodied in the FFS approach, then the upper bounds of potential for widespread and enduring impact are very high indeed. In this regards, the older, more mature Asian programs may offer a glimpse of what the future may bring. To gain these heights, however, fundamental changes will be needed in many of the bureaucratic and attitudinal foundations embodied in most state-run extension programs. The interest in change is, of course, a necessity, but by itself is not sufficient. There must also be a sustained will, accompanied by both an understanding that there is no single answer for all problems, and a willingness to continually explore new ground.

References


Hope and Despair: Extension Agents in a Young Democracy

Tsakani Ngomane, Doctoral Candidate and Graduate Assistant
Constance Flanagan, Professor – Youth Civic Development
The Pennsylvania State University

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Abstract

The nation of South Africa during this critical transition period of economic growth and poverty alleviation provides an intriguing case study of the importance of coordination between government, civil society and the community for sustainable service delivery. The determination of extension agents to facilitate the success of the young democracy is thwarted by numerous field and institutional challenges that others observed and documented while the status quo remained. This paper provides a rare insight into a new discourse of extension as paragons of citizenship, patriotism, and nationalism. Properly approached, extension service can help unlock the service delivery cul-de-sac.

Introduction

On May 10, 1994, after almost a century of oppression South Africans inaugurated their first democratically elected president -- Nelson Mandela. In doing so, they set in motion a wave of change that was to engulf the whole country to give hope and exuberance to millions of blacks who suffered under the yoke of oppression. People expected, and justly so that peace and justice would return to a land torn apart by the violence of apartheid, that dignity would return to a people united in their struggle for freedom (Huddleston, 1992, & Deegan, 2001).

On the contrary, ten years later South Africa, like many young democracies, is a country challenged with a majority of her citizens filled with mixed feelings of hope and despair (Barbarin & Richter, 2001; Deegan, 1999, Glaser, 2000, & Marks, 2000). Among these citizens are extension agents. Extension agents, sometimes called change agents, facilitate change to millions of rural smallholder farmers residing in isolated villages (Ngomane, 2001. In Press). For some of these remote villages, extension agents represent the “only face of government” and the “best catalysts for sustainable development”. It is a very thin line indeed, which separates these smallholder farmers’ perceptions about extension agents, sustainable development and democracy--one may not have one without the other.

The democratic government promised better services for all people, especially to the poor and previously marginalized, with the overall goal of rural poverty alleviation (RuPA). Poor farmers raised their expectations; comfortable in the knowledge that government will fulfill them. Like one extension agent said, “we became their beacon of hope.” In addition, the extension agents themselves got motivated that, unlike in the past, democracy will strengthen their capacity to meet the farmers’ expectations. These agents expected to get support services such as in-service training, improved work facilities, and access to transport (Ngomane, 2001). They expected better recognition at work and respect from the farmers.

As it turns out, service delivery is a long-term process, especially for these extension agents serving remote villages characterized with inadequate and often no basic development infrastructure. Studies have shown that extension services have made significant impact on agricultural development, leading to self-reliance and Rural Poverty Alleviation (RuPA) in Africa, Asia, and the Caribbean (CTA, 1998; & Ngomane, 2000). Others have identified (Bruening & Reynar, 1996), and some have evaluated the constraints limiting extension effectiveness in promoting RuPA (Radhakrishna, 1999).

However, not many studies describe the feelings, expectations, challenges and resilience of extension agents as citizens in a democratic polity, especially in a young democracy such as South Africa. Like others, these extension agents grapple with critical issues: What does democracy mean to them as educators? Do they
feel recognized as significant role players in
civil society and governance? What are their
fears in bringing about change? And what is the
driving force that, despite all limiting factors,
continues to motivate them to strive for RuPA?
This paper presents the first hand experiences of
extension agents in the Northern province (now
called Limpopo) of South Africa as they
describe their feelings of hope and despair,
opportunities and challenges in a young
democracy. By presenting this paper in South
Africa we hope not only to stimulate intellectual
discourse on the phenomenon, but to also
influence government policy on extension
service delivery and sustainable rural
development for poverty alleviation.

**Purpose of the Study**
The overall purpose for the study was to
understand feelings, expectations, challenges,
motivations and policy recommendations of
extension agents relative to the young
democracy. Specifically, the paper examined the
following issues:
1. How extension agents feel about the young
democracy,
2. What expectations they had in service
delivery,
3. What challenges they encounter en route to
helping rural communities reduce poverty,
4. What motivates them to continue serving as
extension agents, and
5. What needs to done by way of policy
recommendations in support of extension
service delivery.

**Methods and Data Sources**
This study is based on field research
conducted in 2001. In collecting the data, we
followed a rigorous qualitative methodology of
collecting interviews, individual and focus
group discussions with extension agents in the
Northern Province of South Africa. This
qualitative research methodology was utilized to
describe feelings of extension agents in a young
democracy. Specifically, five focus group
interviews were conducted with the extension
agents. These focus groups comprised, on
average, 12 participants per group. Qualitative
research methodologists recommend on average
8 participants per focus group and no more than
48 participants in total for projects of a similar
nature to this study (Flick, 1998; & Groeben,
1990). It is the truthfulness of the participant’s
responses and how best the researchers capture
participant’s meaning that is crucial as opposed
to generalizability of the findings. Thus the total
number of extension agents in Limpopo province was not an issue for this project, of
cconcern to us was rank and geographic
representation as well as the truthfulness of
participant’s responses. Participants responded
to five main questions about their feelings,
expectations, challenges, motivations, and
educational implications of civic engagement in
a young democracy. The questions asked were
semi-structured, interactive and narrative in
design. In other words, the researchers used
basic open-ended questions that served as a
guideline for the interviews and focus group
discussions. The precise framing of the
questions depended on the composition of the
group, their experiences and their orientation
about the specific issue under discussion. To
help you understand the nature of the questions
and compilation of the data we decided to quote
verbatim the questions asked as we present the
results and conclusions.

Furthermore, the researchers applied
subjective theory as the appropriate conceptual
framework in collecting information of
participants’ experiences. The subjective theory
recognizes the fact that the interviewees have
complex knowledge about the topic under study
(Flick, 1998; & Groeben, 1990). The elements
of the semi-structured interview were as follows:
1. Open questions to be answered on the basis
of the knowledge the interviewee has
immediately at hand,
2. Theory-driven, objective-directed questions
based on scientific literature and
researchers’ pre-suppositions,
3. Confrontational questions to critically re-
examine the interviewee responses in
relation to theory.

Average time spent on each interview
ranged from one to two hours. The interviews
were audiotape recorded and transcribed. Again
sixty extension agents participated in the study
representing all regions of the province.
Participants represented all levels of extension
service, from field extension agents to middle
managers at regional and provincial levels. We
also observed a policy-defining meeting in the
Sekhukhune region where government policy on
local government service delivery and poverty
alleviation was discussed with the extension

agents. All interviews were tape recorded and transcribed as evidence of data. We also took notes and followed-up some participants with telephone calls to ensure common understanding on issues raised. Literature review and personal experiences of the authors comprised other sources of data for this study. Information thus collected was organized in NUDIST/Nvivo and analyzed following emerging trends, patterns and themes.

Results and Conclusions

These research results and conclusions are presented according to the thematic areas that emerged from the analysis. In addition, direct quotes from the respondents are used as evidence of truthfulness of the data. Thus, some statements might have grammatical and syntax errors, especially from respondents who rarely use the English language in daily communication with their clients. The results are presented as follows:

Theme # 1: Feelings about democracy

Participants were asked to describe their personal feelings about and attributions to service as extension educators in a democratic polity. Emphasis here was on how. Participants were generally positive about democracy. “Apartheid was bad”, they said, “an immoral thing to have happened.” The agents acknowledged the high rate of job losses. However, these they characterized as casualties in war situation. “We are still a young democracy, as we move along more positive things will come. I give democracy 73% success. Personally, I feel the expectation is just too high for government to undo century wrongs within less than a decade”.

Statements such as, “democracy gave us the right to make choices...” were mentioned as evidence of citizenship. In addition, participants expressed attributions of pride and self-worth influenced by the general shift in paradigm from agriculture “…the dirty profession,” to agriculture the “lucrative career choice, and a viable option for our youth.” Democracy brought visibility to the rural areas and better access to information. Female agents speak in tribal court meetings (kgoro), a new cultural pattern never heard of prior to democracy. There is more equity in that “…we now have equitable distribution of resources… including access to education for all.” These patriotic feelings are best captured in the words of one agent who said, “democracy gave us the right to make choices, and that is a fundamental human right I value above all things.”

Theme # 2: Expectations about democracy

The question asked was: “What expectations did you have from democracy relative to your personal and professional life?” Here the emphasis was on what. There were intergenerational differences in the way that young and old participants addressed this thematic area. They all expected change to happen; however, young extension agents felt that they adapted quickly to change and “understood better the development orientation in the country”. Older agents felt the pace of change was too rapid. They expressed concern about disruption of the family structure and disrespect for traditional leadership. The older generation expected to continue providing the core management leadership as they did pre-democracy.

Theme # 3: Motivation/resilient factors

The question asked was “What is it, in your personal background that motivates you to serve in your current role/position?” Again, responses were contextual based on responses to question # 2 above, with more similarities than differences. Family poverty was a common motivating factor for all the participants. As a result, expressions of altruism in phrases such as “wanted to help others,” “to make a difference,” “being a role model,” and “to be exemplary” featured throughout this theme. They all felt a sense of responsibility to others and “wanted to plough back to the community.” As extension agents, they are able to make these socio-economic differences. For some agents, the primary school gardening program, access to college training bursaries, and exposure gained in boarding schools influenced their choice of agricultural extension as a profession.

Theme # 4: Challenges encountered

Participants were asked to describe the challenges they encounter in their effort to deliver services within the young democracy. Responses tended to be contextual, based on geographic location and the political history of the regions. We captured these differences in two categories, namely, field level and institutional level. At field-level, the silo-
approach to service delivery where institutions and units work in isolation, while pursuing similar goals is a problem in extension. Extension agents found themselves caught in the middle of the impasse between traditional leaders and elected local councilors. In the past, traditional leaders had more authority over land in rural areas. At present it is the local councilors that have constitutional authority over development property at local government level.

Some people are more aligned to the traditional leaders whilst others follow the democratically elected local councilors. For instance, participants from Vembe, the former independent state of Venda, where traditional leaders are regarded as special people “appointed by God to lead others for life,” felt strongly challenged by what they describe as “efforts to disempower traditional leaders in favor of what…local councilors just elected to serve for only five years?” “Remain apolitical …” advised one policy maker, but extension agents find it difficult to facilitate change under these circumstances. For extension agents, the political conflict poses serious threat to their service delivery capacity, because they have to work within local structures of authority. If these structures are in conflict, extension agents get caught at the center. Likewise, where agents agonize over limited opportunities for self-development, self-development lends itself to the farmers through better access to alternative information sources. Oftentimes, extension agents feel incapacitated to handle the demands of farmers more informed than them.

At institutional level extension agents described their work environment as unfavorable. They expressed constant fear of retrenchment from the top managers. Ethnicity and nepotism is more obvious with racial and cultural integration. Government bureaucracy they said “is a major problem that hinders the pace of change…we spent more time compiling reports than actually rendering requisite services”. Lack of transport to cover scattered villages was a main concern, especially for the female agents.

In an attempt to portray with clarity the complexity of issues underlying this theme, we use a metaphor, service delivery cul-de-sac. In brief, this means that whereas extension agents are civicly committed to service, the reality of the social change environment negates their service delivery efforts, leading to a cul-de-sac (project failure). That reality could be at field-level, cultural, or even at the top with the leadership styles. Participants described challenges “from the top” as “fear of retrenchment,” “pressure to deliver,” “ethnicity,” “lack of collaboration,” “nepotism,” which negates commitment to sustainable services delivery. In essence, service delivery cul-de-sac represents an interface of hope and despair. We use this metaphor to explain the educational importance of the study to extension service delivery. As you observed, most agents use phrases such as “fear of retrenchment,” “pressure to deliver,” “ethnicity,” and “nepotism” when describing their work environment. Apparently, feelings of hope are slowly turning into feelings of despair for both the farmers and the extension agents. The root cause, they say, “government bureaucracy, lack of collaboration amongst service providers, and political conflicts at local government level.” Besides all these challenges, government expectation is for rapid service delivery for RuPA, which places extension service right at the center of the “service delivery cul-de-sac.” This scenario is illustrated as follows:
Policy Recommendations

The suggestions from extension agents is for an improvement in communication systems within government, setting up mechanisms for better collaboration and coordination amongst service providers (i.e., non-government organizations, public and private sector) and the rural farming communities, separating politics from extension services, recognizing traditional leaders, and provision of basic infrastructure for sustainable rural development. Addressing these issues they say, “will revitalize the hopes and aspirations of the poor and strengthen their confidence in democracy.” The rapid change process, as depicted in the service delivery superhighway will show impact on poverty alleviation. On the other hand, failure to address these issues may easily result in a service delivery superhighway that dead-ends with more rural poverty.

Extension service shall lose meaning to the rural communities.

Specific recommendations are as follows:
1. Adopting a multi-disciplinary approach to extension and service delivery.
2. Removing politics from extension.
3. Recognizing the social capital that extension agents have as patriotic citizens and assets to the community. Let them facilitate change, for they are internally motivated to do so.
4. Creating a favorable work environment; no threats, better communication, and better work facilities such as transport.
5. Strengthening the capacity of extension agents to handle the new demands.
6. Providing career guidance in schools with more emphasis on agri-business.
7. Training and employment of more female extension agents as a strategic necessity.
Educational Importance

Several lessons of significance to scholarship and to policy makers in South Africa emerge from this study. First, the realization that educators are citizens first before they are workers implies a change in approach to development programs and strategies (Boyte, & Kari, 1996, and Waltzer, 1998). Treat extension agents as partners in these efforts; they want change to happen not only for others, but for themselves as strategically placed citizens in governance (Flanagan, Bowes, Jonsson, Csapo, & Sheblanova, 1998). Just think of the implications for the sense of ownership associated with patriotism. Second is the need to further explore the notion of extension service itself, as a contextual phenomenon within a democracy. Research should help develop and document understanding of why, for instance, a fearful work environment negates service delivery.

Third, extension educators should make visible their achievements to government institutions, academia, and civil society and vice-versa. All the educators want is to be exemplary, to make a difference, thus a visible reiterative process can help them show that they do make a difference, and that they are role models. Fourth, an educational lesson of import lies in the metaphor, “the service delivery cul-de-sac”. The old saying about the road to hell being paved with good intentions is a reality for the agents and the rural communities. The excellent political mandate of rapid Rural Poverty Alleviation (RuPA) is being suffocated in the “silo-approach” depicted by parallel lanes in the model. These are service providers working in isolation serving the same community. The outcome is what agents call “White elephants” or project failure, and eventually a state of perpetual poverty. Our last thought in concluding this paper suggests taking the superhighway in service delivery only if one is certain that the superhighway will take them to their intended destinations--fast and easy. Without this certainty the superhighway simply takes us to a dead-end--fast and easy.

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Outstanding Posters

Outstanding Poster Presentation
International Higher Education Loan Program:
A Partnership for International Education in Agriculture
Denise Bjelland, Iowa State University
Bongiwe Masuku and Thembisile Ndimande, Mangosuthu Technikon

1st Runner-Up Outstanding Poster Presentation
Raising Livestock in Resource-Poor Communities of the North-West Province of South Africa: A Participatory Rural Appraisal Study
J. K. Getchell, Cornell University
A. F. Vatta, Onderstepoort Veterinary Institute
P. W. Motswatswe, Department of Agriculture Conservation and Environment
R. C. Krecek, University of Pretoria
R. Moerane, Conservation and Environment
A. N. Pell and T. W. Tucker, Cornell University
S. Leshomo, Department of Agriculture, Conservation and Environment

2nd Runner-Up Outstanding Poster Presentation
Utilizing Distance Education Technologies: The International Potato Center (CIP) and the Department of Agricultural Education at Texas A&M University (TAMU)
Theresa Pesl Murphrey, Texas A&M University
Patricio Malagamba, International Potato Center
James R. Lindner, Texas A&M University

3rd Runner-Up Outstanding Poster Presentation
Raising Awareness of International Issues in Agricultural Biotechnology:
Developing an Educational Website as a Resource for Extension and the Public
Kristin Davis, Kelly Payson, and Tracy Irani, University of Florida

3rd Runner-Up Outstanding Poster Presentation
Appropriateness of the Agricultural and Natural Resources Curriculum at the University of Namibia
Jack Elliot, The University of Arizona
Michelle Owens, FAO Regional Office for Africa
Osmund Mwandemele, The University of Namibia
International Higher Education Loan Program: A Partnership for International Education in Agriculture

Denise Bjelland, Iowa State University
Bongiwe Masuku and Thembisile Ndimande, Mangosuthu Technikon

Outstanding Poster presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Introduction and Purpose

As the world’s population continues to increase and as pressure on natural resources and resource allocation grows, there is a pressing need for expanding the supply of trained professionals in the area of sustainable agricultural development. These individuals can help improve agricultural practices, spread information about new methods of agriculture, and assist the development of and changeover to market agricultural economics – all of which hold the promise of increased food and fiber production, improved distribution, increased agricultural incomes, and hence increased food security for all people of the world.

Throughout the world, there is a basic faith in the power of education to solve problems. Higher education can provide the future intellectual capital necessary to spark positive growth in a country. In particular, agricultural higher education can provide the critical difference in whether we can meet the needs of an increasing world population or face serious threats to food security across the world. The Global Consortium of Higher Education and Research in Agriculture (GCHERA), consisting of more than 400 institutions in more than 130 countries on six continents, has endorsed the establishment of the International Higher Education Loan Program (I-HELP). I-HELP provides loans for junior faculty and graduate students from throughout the developing world to study at higher education institutions recognized as leaders in agricultural higher education. As loans are repaid, those funds are used to fund future Fellows. During its first-year pilot program phase in 2000, nineteen Fellows from twelve countries were placed at Iowa State University for one semester. In 2001, sixteen Fellows from nine countries participated in programs at Iowa State University and Purdue University.

Methods and Information to be Shared

Iowa State University has been charged with taking the lead in developing and administering I-HELP on behalf of GCHERA to ensure a valuable education and to assist in developing individual leadership capacity for participants from all parts of the world. A comprehensive organizational plan has been developed for the selection and placement of participants and for the logistical and financial administration of the program. The purpose of the poster presentation will be to share the model developed by Iowa State University for I-HELP, including:

• the application and selection process,
• program development activities including strengthening leadership capacity,
• the loan repayment model which forgives 50 percent of the loan for Fellows who return to their country of origin and engage in activities that directly support the improvement of higher education and/or contribute directly to food security and environmental sustainability.

In addition, the poster will provide a visual presentation of selected I-HELP Fellows, the areas of study in which the Fellows were engaged during their 12-week program in the U.S., and examples of how the knowledge they acquired in the U.S. is being used in their home countries to improve agricultural education and/or food security and environmental sustainability. The opportunity to present this poster in Durban, South Africa, is particularly timely since two Fellows from Mangosuthu Technikon in Durban plan to participate in the conference.

Educational Importance

The I-HELP program is built on the assumption individuals and their families are best equipped to make serious human capital investments in their communities/development. I-HELP will give individuals from developing countries access to credit resources, allowing them to invest in their own education. Not only is individual human capacity expanded, but as the individual’s sphere.
Raising Livestock in Resource-Poor Communities of the North-West Province of South Africa — A Participatory Rural Appraisal Study

J. K. Getchell, Cornell University  
A. F. Vatta, Onderstepoort Veterinary Institute  
P. W. Motswatswe, Department of Agriculture Conservation and Environment  
R. C. Krecek, University of Pretoria  
R. Moerane, Conservation and Environment  
A. N. Pell and T. W. Tucker, Cornell University  
S. Leshomo, Department of Agriculture, Conservation and Environment

1st Runner-Up Outstanding Poster presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Introduction
Gastro-intestinal worm infections are one of the most important causes of mortality and poor production in ruminants, particularly in sheep and goats, in resource-poor production systems worldwide. In order to determine the prevalence and importance of these parasites, a survey of internal parasites of domestic ruminants is being conducted in the North-West of South Africa. A complementary survey on farming systems and on farmers' attitudes in resource-poor areas was undertaken to ensure that recommendations on parasite control could be implemented by the farmers.

Purpose of Paper
A participatory research model was used in six village communities in the Molopo and Ditsobotla Districts in the Central Region of the North-West Province in order to achieve the following broad objectives: to understand in basic terms the way of life of these communities, to obtain information on the challenges farmers face in raising livestock in these areas, and to evaluate the farmers' level of knowledge of internal parasites in their animals. The project ran from May to August 2000.

Major Points or Information to be Shared
Information obtained at participatory workshops clearly indicated a need for improvements in water supply, schools, job creation, and health services. Lack of pasture for grazing livestock was also cited as being important. Other most frequently mentioned livestock problems included "gall sickness" (a vaguely defined condition not necessarily referring to tick-borne gallsickness), parasites (both external and internal), chicken diseases, and ingestion of plastic bags which have been discarded. Informal farmer interviews showed that most farmers seem to know what signs of internal parasites they should look for in the live animal. It was found that most farmers use a combination of treatments — ranging from Coca-Cola™ for "gall sickness" to the plant sebetebete (Senna italica) as a treatment for liver problems — as well as commercial medicines. It appeared that many farmers who use commercial medicines administer improper dosages.

Conclusions
There were some difficulties in using the participatory methods since it was the first time that the facilitators and the communities had been exposed to them. After many years of receiving free services from the government, many communities had difficulty in dealing with the concept of finding solutions within the community, which is such an integral part of participatory methods. There was insufficient time to look at possible solutions to many of the problems.

Educational Importance
The study contributes to the base of knowledge required to develop appropriate extension materials for the livestock owner in this province.
Utilizing Distance Education Technologies: The International Potato Center (CIP) and the Department of Agricultural Education at Texas A&M University (TAMU)

Theresa Pesl Murphrey, Texas A&M University
Patricio Malagamba, International Potato Center
James R. Lindner, Texas A&M University

2nd Runner-Up Outstanding Poster presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Introduction
Technology is offering new ways to enhance teaching and learning effectiveness, meet the needs of learners, and reach broader audiences. The exploration of how to best use the technology to do this is a continuous process as the technology continues to change and advance. The Department of Agricultural Education at Texas A&M University (TAMU) and the International Potato Center (CIP) formed a collaborative partnership in 1999 aimed at more effectively providing knowledge and learning experiences to developing countries. The collaborative partnership was formed to build the capacity within CIP to provide rapid, modern, and appropriate learning delivery systems to its developing country partners by drawing on the expertise within TAMU for distance learning technology/delivery and content-related expertise.

Purpose
This poster presentation describes the activities that have resulted from collaboration between TAMU and CIP, the steps taken to build capacity within the partners, and steps that are planned for the future. Further, the poster describes lessons learned throughout the collaboration that can benefit institutions and individuals interested in using technology to facilitate learning.

Major Activities to be Shared
The CIP/TAMU collaboration focuses on pursuing effective use of distance education technologies. The partners utilize distance education technologies to better carry out research and disseminate outcomes in timely and effective ways. Joint collaboration encourages the evaluation of appropriate use of distance education technologies as partners strive to serve as a leader in the field of technology-assisted-learning at a distance and in the traditional classroom. Activities to be described in the poster include:
- Capacity Building Activities
- Training/Education Activities
- Administrative Activities

Conclusions and Educational Importance
The objective of the program is to expand efforts beyond the CIP/TAMU collaboration and enable other centers to benefit from the lessons learned. Engaging the interest of the different centers of the Consultative Group on International Agricultural Research (CGIAR) and of US Universities could provide a mechanism for rapid progress in closing the communication and learning divide that is threatening agricultural and economic development in countries of Africa, Latin America, Asia and Central and Eastern Europe. The importance of this project relates to the network of linkages to be established with other universities and CGIAR centers to build on the original experience and formation of a consortium to quickly move forward in the efficient delivery of information with technology-assisted-learning. Closing the digital divide is essential to promoting incomes for poverty eradication and for market development. Increasing rural income, by providing new technologies and market opportunities, is a major (the only) sustainable path to poverty eradication. Collaboration is the key to successful implementation of the process.
Raising Awareness of International Issues in Agricultural Biotechnology: Developing an Educational Website as a Resource for Extension and the Public

Kristin Davis, Kelly Payson, and Tracy Irani, University of Florida

3rd Runner-Up Outstanding Poster presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Abstract

The development of agricultural biotechnology has proceeded rapidly amidst public controversy over the ethics of genetic manipulation and the required level of regulation. Due to its favorable subtropical climate, Florida hosts a large number of field trials of genetically modified crops. Therefore, the Florida Education Initiative for Agricultural Biotechnology (FEIAB) developed a web site to provide unbiased, science-based information to the public and extension personnel on the issues surrounding agricultural biotechnology. Development of the web site was guided by the needs expressed by Florida extension agents in a 2001 survey on extension education in agricultural biotechnology. The inclusion of international issues was seen as an important addition to the sphere of public information.

The overall purpose of the project was to provide resources to extension and the general public to increase understanding of the issues surrounding agricultural biotechnology, enabling them to make informed decisions. To accomplish this, county extension faculty (n=109) were surveyed to ascertain their needs in delivering information on this topic. The survey revealed that extension’s primary needs were helping consumers identify the issues, providing a balanced viewpoint, and facilitating public forums for debate. On the basis of those needs, a web site was developed which provided resources such as downloadable fact sheets, frequently asked questions and links to other sources of information. To facilitate understanding of the broader impacts of biotechnology, the site content was divided into state, national and international issues. A discussion forum was added to the site as a tool for increasing interaction and feedback from site users.

The web site makes a specific contribution to the educational materials on agricultural biotechnology through its development of a section on international issues. To help consumers evaluate information, we felt it was critical to provide the international context. An informed decision cannot be made without understanding the international implications of agricultural biotechnology. In reviewing other web sites, it became evident that there was a lack of clear summary information on these subjects. Therefore, the FEIAB site was designed to facilitate the exploration of the main international concerns, identified as biodiversity, food safety, intellectual property rights, developing country issues and trade. Each section includes a brief summary to orient readers to the main viewpoints and links to more in-depth information.

Based on a needs assessment of extension personnel and a comprehensive review of websites worldwide, it was concluded that international issues in agricultural biotechnology have not been adequately addressed. It is therefore imperative that the international scientific and educational community step forward to provide extension educators and the public with clear, objective information on these issues.

Our poster will summarize survey findings and depict the various internal pages of the web site. Several laptops will be available for interactive exploration of the site. Handouts summarizing the international issues will be available. CD-ROMs will be available in conjunction with a questionnaire to generate feedback on the site.
Appropriateness of the Agricultural and Natural Resources Curriculum at the University of Namibia

Jack Elliot, The University of Arizona  
Michelle Owens, FAO Regional Office for Africa  
Osmund Mwandemele, The University of Namibia

3rd Runner-Up Outstanding Poster presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Introduction

The University of Arizona and the University of Namibia entered into a Memorandum of Agreement (MOA) in the Fall of 2000. Many activities are planned within the MOA, but one of the first activities was a joint curriculum assessment during a summer 2001 three-day curriculum workshop. The main purpose of the workshop was to determine curriculum appropriateness as the five-year old college moves from a quarter to a semester-system.

Purpose

The purpose of the poster is to illustrate the curriculum review process and outcomes.

Major Points

1. The previous curriculum efforts will be summarized.
2. The current curriculum status will be illustrated.
3. The curriculum review process will be explained, especially as it relates to the involvement of stakeholders.
4. The new proposed curriculum will be shared.

Educational Importance

Given the similar climates and geography between Arizona and Namibia, they are natural allies in arid lands educational efforts. The curriculum advances illustrated in this poster are a direct result of many years of effort on behalf of the FAO and an illustration that the many past efforts provided a sound foundation that made this effort move along smoothly and efficiently.
Association for International Agricultural and Extension Education
18th Annual Conference
Durban, South Africa
May 26-30, 2002

Outstanding Carousels

**Outstanding Carousel Presentation**

Success Outcome Markers in Extension (Some):
An Evaluation Tool for Complex, Hard-to-Measure Transformational Programming
_S. Kay Rockwell and LaDeane R. Jha, University of Nebraska-Lincoln_

**1st Runner-Up Outstanding Carousel Presentation**

A Global Perspective of Extension: Trends and Issues
_Satish Verma, Louisiana State University Agricultural Center_

**2nd Runner-Up Outstanding Carousel Presentation**

An International Agriculture Course with an Intercultural Experience
_Harry A. Carey and Thomas H. Bruening, The Pennsylvania State University_

**3rd Runner-Up Outstanding Carousel Presentation**

Distance Education Competencies of Faculty Members in Iran
_Mohammad Chizari, Tarbiat Modarres University
Hamid Movahed, University of Tehran
James R. Lindner, Texas A&M University_
Success Outcome Markers in Extension (Some):
An Evaluation Tool for Complex, Hard-to-Measure Transformational Programming

S. Kay Rockwell and LaDeane R. Jha, University of Nebraska-Lincoln

Outstanding Carousel presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Agricultural Extension Educators seeking better ways to evaluate complex, multi-strategy programs that assist individuals transform their lives conducted action research to test the application of Outcomes Engineering concepts originally developed for evaluation work in social service agencies. Six concepts considered in the testing process were vision, mission, “whos,” outcome challenges, success markers, and journey mapping. Causal relationship between a program and an outcome were considered and useful theoretical constructs were developed. SOME (Success Outcome Markers in Extension) is the practical application of the findings.

Major points of information to be shared in the carousel roundtable session. A paper describing the tools embedded in the SOME process: vision, mission, “whos,” outcome challenges, Success Markers and Journey Mapping will be discussed as they apply to Agricultural Extension Educators as they focus on the strengths of their programs and clients, identify and involve stakeholders, and integrate evaluation strategies into their programming.

Theoretical/philosophical themes. It is no longer sufficient in Extension to report the number of programs offered, participants reached and goals attained. Rather, Agricultural Extension Educators must be poised to report results that focus on social, economic and environmental outcomes. For complex, hard-to-measure transformational programs, realistic evaluation processes need to be developed and SOME (Success Outcome Markers in Extension) addresses this challenge. A team of Extension Specialists, Educators, Project Assistants and Coordinators, community partners, and graduate students used an appreciative inquiry approach to (a) identify and build on strengths in the group, (b) experience generative conversations to move the group into creative action, (c) create visions of what could be, and (d) use the power of dialogue to transform the organization.

Results and/or conclusions. SOME, or parts of the process, is/was (a) included in the evaluation plan for five complex, transformational Extension programs to assess outcomes and (b) presented in hands-on-training workshops for Agricultural Extension Educators that initiated systemic change to start integrating Success Markers into the state-wide Cooperative Extension programming process. This strategy is strengthening the integration of program evaluation in the entire program planning process. During the two-year period the team worked on SOME, the strategy provided outcome documentation team members used for supporting evidence to help them continue or obtain 2.3 M in grants or contracts in transformational programming projects.

Educational importance. SOME is a useful programming strategy to identify realistic programs outcomes and impacts in transformational programming. Colleagues in Agricultural Extension Education, as well as colleagues in sister agencies and organizations, can use the constructs to strengthen the integration of evaluation into the programming process, document outcomes and impacts, and use the findings to obtain resources for additional programming.
A Global Perspective of Extension: Trends and Issues

Satish Verma, Louisiana State University Agricultural Center

1st Runner-Up Outstanding Carousel presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Introduction
The evolution of Extension as an instrument of development in the 20th century and future possibilities into the 21st century is a provocative topic for debate among policy makers, administrators, academics, researchers, and practitioners. Given that Extension is a worldwide institution, with differences in the way Extension systems around the world are philosophically grounded, financed, organized, planned, delivered, and evaluated, and yet have common threads and face similar issues implies interesting possibilities for such a debate.

Purpose
The purpose is to present an overview of the significant trends and discuss the emerging issues in Extension from a worldwide perspective.

Method
The information has been gathered from secondary sources both published and unpublished, and will be a review of extant literature on the subject.

Major Points
Significant organizing trends to be presented include public sector extension, private sector extension, NGO sector extension, sector combinations, emerging systems in Eastern and Central Europe, and paradigms for the future. Ways in which extension is financed, how extension programs are developed, differences in perspectives of the functions of extension as a system, and emerging roles will also be presented.
Some of the emerging issues facing extension to be discussed include the appearance of a new “extension vocabulary”, the roles and responsibilities of the public and private sectors in meeting individual needs and/or the public good, program and financial accountability, and relevance and sustainability, indeed in some instances, survivability of the extension system.

Conclusions
There are both similarities and differences in the way extension systems are organized and operate around the world. While there is likely a basic underlying philosophical tenet of education and change directed to development and improving the lives of citizens, country systems are products of their specific traditions and cultures, and have to be recognized and understood in those contexts.
A number of common critical issues face extension systems around the world. These have to be addressed by countries in their own specific situations. There is no panacea. However, experiences and lessons learned need to be shared.

Educational Importance
The sharing of a worldwide perspective of trends and issues in extension will contribute to the literature and should enhance understanding of this topic among conference participants and the profession.
An International Agriculture Course with an Intercultural Experience

Harry A. Carey and Thomas H. Bruening, The Pennsylvania State University

2nd Runner-Up Outstanding Carousel presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Introduction

We have been experimenting with international agriculture course offerings for more than 20 years at Penn State University. The course that inspires the most international involvement after student graduation is one that includes an intercultural field trip. Presenting an overview of this capstone course and discussing course elements and activities with faculty from other universities would be beneficial to all concerned. We can share activity-planning strategies, with successes and failures.

Course Agenda

Problem Solving in Tropical Agriculture, IntAg 481, features problem solving in an international setting and provides an opportunity for students to study agricultural development in Puerto Rico, a culture quite different from our own. Students establish objectives then learn to design a rapid appraisal process to meet those objectives. They lay out their data gathering plan, along with target interview groups, and generate a possible list of questions. They are well-prepared and confident when they actually carry out their plan on site in Puerto Rico. Alongside rapid appraisal methods and techniques, students learn about group processes and teamwork. This is supported through many student-led learning activities in the classroom prior to the field trip. Everyone gets comfortable with everyone else. We also present an in-depth look at the Puerto Rican culture and have participants compare it to our own. Often, this is the first time students have looked critically at their own culture and find weaknesses as well as strengths. The problem solving areas applied to ag-related issues such as: a) cropping systems and animal systems management, b) integrated small farms management, c) formal and nonformal rural education, d) knowledge systems, information networks, e) decision-making influences, and f) program planning.

Lessons Learned

Over the years, Penn State faculty have developed a wonderful relationship with the faculty at the University of Puerto Rico – Mayaguez Campus and other field professionals in their extension service, FSA, NRCS, etc. They are the folks we count on to make arrangements with farmers, agency staff, and other ag-industry people that we involve with our interviews and meetings. These relationships are of utmost importance in carrying out a meaningful program and must be nurtured in many ways.

Conclusion and Educational Importance

In addition to supplying students with the tools for international development work, the knowledge and insights gained in IntAg 481 better-prepare students to perform effectively in our own culturally diverse society after graduation. Previous students report that they are more competitive in the job market because they have taken this course, traveled to Puerto Rico, and gained knowledge and a greater sensitivity to Hispanic cultures and people.
Distance Education Competencies of Faculty Members in Iran

Mohammad Chizari, Tarbiat Modarres University
Hamid Movahed, University of Tehran
James R. Lindner, Texas A&M University

3rd Runner-Up Outstanding Carousel presented at the 18th Annual Association for International Agricultural and Extension Education Conference, Durban, South Africa, May 26-30, 2002

Introduction

The integration of computers and other information and distance education technologies is changing how students learn. Distance education provides a means for students to assess learning environments regardless of location/time constraints. Distance education also supports andragogical learning principles. While the Internet has fairly widespread adoption and use in educational institutions in developed countries, it is not the same for educational institutions in developing countries, including Iran. In studying agricultural faculty, Murphy and Terry (1995) found that low rates of adoption and use of information and distance education technologies was related to low technological competencies and lack of training and development opportunities. For the integration, adoption, and use of information and distance education technologies to be successful, training and development programs must focus on the needs of the learners.

Purpose and Methods

The purpose of this study was to examine factors affecting adoption and use of the Internet and World-Wide-Web. Faculty members (N=180) at the agricultural colleges of Tehran and Tarbiat Modarres Universities, Iran were the population for this study. The research design for this study was a descriptive and correlational survey method. A response rate of 96% was attained.

Major Points and Lessons Learned

Results showed that about half of the respondents used the Internet and seventy percent of those using the Internet had access to computers at the College Computer Centers. Only twenty percent of faculty had access to the Internet in their homes. Among the software packages that they used most were Word, SPSS, and Minitab. AGRIS, AGRICOLA and ERIC were the most used online reference databases. Respondents indicated they were fluent in using the Windows operating system. Faculty members indicated their interest in attending Internet courses. Departmental computing support management information offices were considered to be good sources of information and training with respect to the use of computer software and the Internet.

The result showed that the faculty encouraged their students to use computers to do their assignments and research references online. However, students were limited due to the lack of computers at the College of Agriculture. Eighty percent of faculty members had e-mail addresses. A majority of respondents indicated they self-taught themselves to use the Internet. Faculty used the Internet primarily to find scientific resources. Respondents indicated that the most important benefits of using the Internet were improving research and educational activities, and saving time in obtaining data. Respondents used the Yahoo search engine most often.

Educational Importance

The educational importance of this study is focused on three areas: distance education, needs assessment, and faculty perceptions. The results of this study will help Iranian Universities better understand its faculty member’s needs with regards to information and distance education technologies. Prior to this study, agricultural faculty members’ perceptions toward information and distance education technologies had not been studied. However, faculty members in other fields and other countries have been studied. The results from this study can now be compared across nations and cultures to understand the generalizability of findings and applicability of recommendations.
Editor’s Note: The following abstracts are derived from research papers presented at the 18th Annual AIAEE Conference. The complete papers are available on the AIAEE Web site at: http://www.aged.tamu.edu/aiaee/2002/

Traditional Institutions, Social Capital, and Multi-Institutional Partnerships for Agricultural Development: Implications for a new Extension Paradigm

Adewale Johnson Alonge
Miami-Dade Public Schools System, Florida

Traditional institutions - such as indigenous cooperation groups, peace pact systems, household systems, elders and political leadership, are important forms of social organization in many parts of the developing world. After many decades of neglect and near disdain, development agencies worldwide have now come to acknowledge how critically important it is to incorporate traditional or local level institutions serving the poor as partners in the development process. Hence, discussion about the future direction of extension worldwide has centered on different models of public-private-local institution partnerships. While supporting the overall objectives of multi-institutional partnership, this paper analyzes the opportunities and challenges inherent in developing public sector-local level institution partnerships for agricultural extension in less developed countries. It contends that factors such as structural and institutional defects in public sector extension in many less developed countries, a lack of commitment to the pluralism and low institutional capacity, constitute major constraints to the development of true partnership with traditional institutions. The paper recommends reforms such as the decentralization of public sector extension, professional development of extension personnel, and the organization of rural communities into empowerment nodes, as means to enhance capacity for multi-institutional partnership for extension.

Analysis of the Partnership Between The University of Cape Coast, Ministry of Food and Agriculture, and GTZ in an Integrated Crop Protection Project in Brong Ahafo Region of Ghana

Festus Annor-Frempong, Moses M. Zinnah and Samuel Akuamoah-Boateng
University of Cape Coast, Ghana

This paper presents a study that analyzed the partnership between the University of Cape Coast, Ministry of Food and Agriculture, and GTZ (German Technical Cooperation) in the Integrated Crop Protection (ICP) Project in Brong Ahafo Region of Ghana. Interview schedules, farmer meetings, and field tours were used to collect data from 80 farmers involved in the project. Analysis of students’ dissertations, project documents and personal communication with students and lecturers/supervisors were also used to gather data for this study. The study revealed that the partnership was not necessarily formal but involved groups with complimentary objectives and roles aimed solving farmers’ problems. The partnership acted as a forum for rural development. The levels of adoption of the ICP technologies by farmers were high. The major problem was that of group formation process. Valuable agricultural data were generated for future programme planning. The interactions among people involved in the partnership enhanced positive perceptions toward each other. Among the factors that enhanced the partnership were good and committed leadership, open-minded communication, and sharing of common resources. The study suggests, among other things, that partnership between private and public sectors is possible. However, it should dovetail into existing structures.
Determinants of Adoptive Behaviors of Rural Farmers in Nigeria
C. C. Asiabaka, University of Technology, Owerri, Nigeria
Michelle Owens, FAO Regional Office for Africa, Accra, Ghana

The major objective of the study was to assess the effect of information source and the attributes of a technology on the adoptive behavior of rural farmers in Nigeria. It assessed the perceptions of rural farmers on the availability, credibility, and degree of use of information sources. The variables tested in technology attributes were complexity, availability and cost, and compatibility. Data were collected from 480 farmers from southeastern Nigeria. Findings indicate farmers’ socioeconomic characteristics such as age and education influenced their adoption behavior. Results indicate that the source of information was a significant factor in determining farmer’s adoption behavior. Variables such as credibility, availability, interest and usefulness of the information source had positive coefficients and were found to be statistically significant at 0.05 level. Findings also show that technology attributes such as complexity, cost and availability and compatibility were positive and statistically significant at both 0.05 and 0.01 levels. The study concluded that farmer’s personal characteristics, the source of agricultural information and technology attributes were significant determinants of farmer’s adoption behavior. It recommended that extension providers in Nigeria should consider these variables in planning and implementing extension intervention strategies.

Leadership Development Training In Extension: A Research-Based Curriculum Design
John E. Barbuto, Jr. and Arlen W. Etling
University of Nebraska-Lincoln

One of the great challenges leadership development specialists face is how best to facilitate the development of community leaders, given the social and economic challenges faced by these communities. These leaders of communities often times are limited in time and resources to engage in such training, and the instrumentation/assessment necessary to substantively impact behavioral changes is often available at premium costs. The dilemma is this: how can educators provide world-class training to our community leaders on an extension specialist budget, in absence of philanthropic foundations and/or grants? This paper will discuss this issue, outlining a curriculum design, which optimizes community leaders’ experiences and learning opportunities, while providing a strong research data-base, at a fraction of the costs of other educational methodologies. This philosophical paper is intended to provide practical ideas for both programming and collaboration that optimally lend themselves to the research, extension, and outreach missions of most land grant and public universities. Specifically, this paper addresses 1) the leadership development process, 2) the need for research-based programming, 3) the integrative opportunities between extension and research agendas, and 4) the reporting advantages for documenting impacts. A leadership development curriculum designed by the primary author and used in cross-cultural settings will also be described in this paper, as it relates to each of these objectives. The curriculum design described encompasses the full range of leadership behaviors, ranging from transformational to purely transactional (Burns, 1978; Bass, 1990). The methodologies used in the curriculum are also grounded in research, based on the three-tier leadership development process – assessment, challenge, and support (McCaulley, Moxley & Velsor, 1999).
An Anthropological Approach to Extension: Implications for Sustainability
Pamela Bartholomew and Natalie J Bourdon
Michigan State University

Extension is in the process of going through a critical change; it is beginning to question how well it actually achieves its goal of serving people. There are valid criticisms regarding Extension and its historical role in development as a medium through which neo-colonialism has occurred, despite the original intentions and foundations of Extension. In this paper, we call on contemporary anthropological conceptualizations and a human rights-based approach to Extension and international development to address such criticisms. Using the anthropological and human rights-based literature we can more fully realize the emancipatory goals inherent in Extension. This approach, along with anthropological conceptions, can be used by Extension program planners, adult educators, and evaluators to assist communities in realizing their development agendas in a sustainable manner by taking issues of gender, power, household relations, and the effect of the politico-legal system on the people directly implicated in and by international developmental efforts.

Partnerships in Research with Indigenous Groups:
A New Perspective for Agricultural Development
Fekadu Beyene
Alemaya University, Ethiopia

This paper presents analysis of issues pertinent to partnership in researching with local people. The aim of the paper is to review and argue the two main approaches in conducting agricultural research: conventional and participatory approaches that recognize farmers as partners. Emphasis is given to the methodological aspects from a comparative perspective with the conventional research approach. First, an overview on the prime usefulness of participatory approaches is presented followed by a little introduction on the meaning of indigenous knowledge in an attempt to justify for involving the periphery in agricultural research. It then analyses how local people and scientists organize themselves around agricultural research and extension. The third section draws on Ethiopian experiences in involving farmers in research with especial emphasis to the work of three organizations in forming partnerships. This is followed by a section that delineates the doubt of certain categories of professionals with participatory research methodology in revealing testable and measurable results within the realm of science. Reflection from Ethiopian experiences and the shift of focus in agricultural research are taken as points of departure for the argument and analysis. Lastly, it draws possible conclusion in relation to the needs for shifting towards an alternative perspective for doing agricultural research.

Needs of Extension Officers in the Northern Province of South Africa
Thomas Bruening and Harry Carey, The Pennsylvania State University
Trent Schriefer, State University of New York
Naftal Mollel, University of the North, South Africa
Khalipha Bility and Tsakani Ngomane, The Pennsylvania State University

Extension officers in the Northern Province of South Africa were surveyed to determine their educational needs. More than 340 officers participated in the study. More than 70% of the officers had been in extension for more than 10 years. The officers indicated that they needed technical agricultural information, better teaching methods, and improved communication skills. Many officers also indicated that they lacked basic office equipment and most lacked high tech equipment such as computers to do their work. Officers indicated that they were interested in obtaining more professional development education.
Financial Recording and Analysis Systems on Irish Dairy Farms: The Role Played by Extension

Ailish Byrne, Kildalton College, Kilkenny, Ireland
Dermot J. Ruane, National University of Ireland, Dublin, Ireland

The increasing pressure on farm profits in the Republic of Ireland (ROI) has created a need for vigilant and ruthless monitoring of the financial performance of the farm business. Recognizing the changes that are taking place in Irish agriculture, the Agricultural and Food Development Authority, Teagasc, reorganized its advisory resources into two new services in 2001; (1) Technology and Business Service and (2) Rural Viability Service (Teagasc, 2001). Two survey instruments were developed, to examine the role played by the Teagasc in farm financial management in the ROI. The first survey consisted of a small questionnaire attached to the Autumn 2000 supplement of the National Farm Survey (NFS). The second survey consisted of an interview survey of 140 dairy farm proprietors who were members of Irish extension-organized dairy discussion groups. The results from the NFS showed that dairy and tillage farmers were most likely to have used farm advisory reports to aid them in making farm financial management decisions for the farm business. The interview survey results showed that the majority of respondents reported that the accountant was the most useful source of professional farm financial advice. The respondents used annual tax accounts (98%) and the Teagasc developed Dairy Profit Monitor (53%) and DairyMIS (60%) for farm business assessment and analysis. This shows that Teagasc have an important role to play in farm financial management support for farmers.

An Assessment of Individual Outcomes from a USDA Technical Assistance Program

Mary Lou Carlson
The Pennsylvania State University

The Cochran Fellowship Program (CFP) is one of the US Department of Agriculture’s (USDA) major international technical assistance efforts providing short-term technical assistance training from 1984 through 1999 to over 6,500 individuals from 67 lesser-developed countries. The USDA/CFP administration expects that, upon their return, the participants will be catalysts for change in their businesses or organizations, and hopefully make a difference in their countries. The innovation-decision process through which an individual passes is a well-researched and empirically documented time-ordered sequence of action and decision steps. After learning about new CFP ideas or innovations, participants will not decide about the new ideas or innovations unless they have a positive individual attitude about them. The purpose of this study is to identify and describe outcomes about America for CFP participants. In particular, 178 Poland participant attitude changes were assessed. Descriptive data shows, overall, that attitudes about America changed from before to after the CFP. The greatest positive attitude change from before to after the CFP was about American management style by almost 50% of the respondents, followed by American market economy, American people, and American products. Qualitative text, not yet completely analyzed, is expected to complement the quantitative data.
A Needs Assessment of Soil Conservation Competencies for Farmers in the Markazi Province of Iran
Mohammad Chizari and Saeed Karimi, Tarbiat Modarres University, Tehran, Iran
James R. Lindner, Texas A&M University

The purpose of this study was to examine factors affecting adoption of soil conservation technology by farmers in Markazi Province, Iran. A random sample of 381 farmers was selected for participation in the study. Data were collected through personal structured interviews with participants at their farms. Overall, farmers tended not to be aware or have low levels of awareness with respect to soil conservation technology. Farmers tended to agree or were unsure about soil conservation technology. The most selected sources of information were other farmers, friends and relatives, radio programs, Extension agents, and television programs. The least selected sources of information were extension films/movies and local leaders. Concerns over awareness of soil conservation practices, technology, and responsibility for conservation are discussed.

Training Needs of Agricultural Extension Agents in Myanmar
Khin Mar Cho
Institute of Rural Sociology and Extension, Giessen, Germany

This paper examines the training needs of extension agents in Myanmar agriculture, specifically, the practice of different extension approaches, activities, methods and principal problems of extension agents in their fieldwork. The purposes of this paper are 1) investigating the training needs for extension agents to perform their work effectively, 2) suggesting the suitable extension method for the present agricultural extension service in Myanmar, and 3) identifying the primary functions and major problems of extension agents in Myanmar. None of Yezin Agricultural University and all State Agricultural Institutes in Myanmar had introduced courses on Participatory Extension Approach (PEA), Participatory research, Participatory Technology Development so far, although different aspects of agricultural extension education have been included in the curriculum recently. These institutions have a vital role to play in the development of knowledge concerning PEA and other issues of sustainable agriculture. Therefore, these institutions should work in collaboration with Myanmar Agriculture Service; Agricultural Extension Department and research centres introduce courses concerning participatory extension in their curricula and conduct research activities. Agricultural trainings for the extension agents held in Myanmar were mostly crop production oriented trainings and agents have little knowledge and experience in extension education. According to the centralized administration, the extension workers have being practicing mostly the training and visit system in a top-down manner. Due to the non-involvement of local people in the extension program planning, implementation, and decision-making process, the extension service developed inefficiently. Therefore, the extension workers, researchers, and local farmers should cooperate in the extension work, especially in the planning, implementation, and evaluation of the extension program to develop the extension service in Myanmar Agriculture. The local farmers should be involved in the decision-making process because they are really facing the problems in their field. All extension workers and subject matter specialists are now interested in implementing PEA in the future in the agricultural extension service in Myanmar.
A Comparative Evaluation of Some Participatory Needs Assessment Methods in Extension
Gustav H. Düvel, University of Pretoria, South Africa

The paradigm shift to more participatory approaches and the extensive use of PRA has emphasized the importance of needs, but has also led to more questions regarding the reliability and validity of the various methods. This paper compares different approaches of needs assessment in order to get a better understanding of their possibilities and limitations. The findings are based on a study conducted in Ganyesa, a rural district of the North West Province of South Africa, for which data were collected in three phases using different methods. Evidence in support of the hypothesis, that problems and needs can be used interchangeably, was found in the highly significant correlation between respondents’ importance rank order of identified problem and needs. From comparative observations of the spontaneity of responses regarding own problems and needs, it appears that these assessments are equally reliable and valid. Respondents also seemed to find it easier to list the problems of the community than their own. Needs are influenced very significantly by group interaction and they also change over time, as was shown by a comparison of assessments done at two-year intervals. This has practical implications regarding the value of assessed needs and emphasizes the importance of remaining sensitive regarding changing needs as situations change. Gender, age, and geographic location (service centres) were investigated as determinants having a possible influence on the individual’s needs. The latter has by far the biggest influence and thus justifies separate need appraisals per community or sub-community.

Technology Use by Private Agricultural Extension Agents in Messinia Prefecture, Greece
Jack Elliot and Trish Claves
The University of Arizona

Private, as well as public extension shares a role in the diffusion of new technology and information to farmers. The personal computer has become an integral part of telecommunications. The purpose of this study was to determine if an innovation, the computer, has diffused among geponoi in the private sector in Messinia Prefecture, Greece and how it was being utilized. An oral questionnaire was administered to the private extension agents operating their own agricultural inputs businesses in the Messinia Prefecture in Southwestern Peleponneses, Greece. Each subject was visited in his or her place of business and the oral questionnaire was conducted in Greek by the same interviewer for every participant. The analyses were based on usable responses from 41 subjects. There was a positive, very strong association between computer ownership and the year the agent graduated, age, years of experience in agriculture and years as a business owner. A positive moderate relationship existed between computer ownership and the university attended and a negative moderate relationship between computer ownership and children in the household. A positive low association was found between computer ownership, additional education and major field of study and a negative low association with the size of the agent’s operation. There was a positive negligible relationship between computer ownership and gender. It is recommended that both public and private extension agents in Greece utilize computers and the Internet for information delivery. By the nature of their position, the more they use the innovation, the more others will adopt it.
Factors Associated with the Use of Pesticides in Uganda: Strategic Options for Targeting Integrated Pest Management (IPM) Programs  
J. Mark Erbaugh and Joseph Donnermeyer, The Ohio State University  
Samuel Kyamanywa, Makerere University, Kampala, Uganda

Targeting particular groups who share similar production practices and problems has proven to be a cost-effective, efficient way to design and disseminate agricultural technologies. The accumulated evidence indicates that where successful, Integrated Pest Management (IPM) programs have been goal-oriented and targeted. Because one of the primary goals of IPM is to control pests while reducing the use of synthetic pesticides, knowledge of social, economic and institutional factors that influence farm-level decisions to adopt pesticides may suggest different targets and strategies for disseminating IPM. Using a multi-staged sampling procedure, two hundred farmers from two districts in Eastern Uganda were interviewed regarding their socioeconomic background and pest management practices. Regression results indicate the most important predictor of total pesticide use was growing tomatoes, followed in order by owning a backpack sprayer, farming in Kumi district, a higher level of education and more contact with extension. These results suggest targeting specific crops and cropping environments associated with high pesticide use for IPM programs. Farmers owning backpack sprayers could be targeted for programs that integrate pesticide safety and information about IPM. Extension agents also need to be provided information about and trained in IPM. Alternative IPM approaches are recommended for farmers who are not using pesticides.

Globalizing Colleges of Agriculture  
Arlen Etling and John E. Barbuto, Jr.  
University of Nebraska

This paper is a case study of how the International Programs Division (IPD) at the Institute of Agriculture and Natural Resources (IANR), University of Nebraska, was managed during its second year of reorganization. A strategy to support globalization of the college was written and approved during the first year, then adapted and implemented during the second year. This case study tells 1) which efforts were continued into year two of the reorganization, 2) what new efforts were initiated, and 3) how scarce resources were augmented. It also describes management techniques that were used, program accomplishments, impacts and evaluation results. Efforts continued from year one included emphasis on the undergraduate minor and study abroad. The number of minors increased by 466% in 2001. Two new study abroad programs were initiated and two others were continued. A directory of international jobs was updated to help graduate and undergraduate students find jobs after graduation. Geographical interest groups (mainly faculty) started in 2000 continued and carried out at least one major project for each group. New efforts initiated focused on residents of Nebraska. IPD collaborated to offer nine seminars and conferences on impacts of globalization upon agriculture and families as well as a multi-state immigration forum. A senior faculty associate position was created in IPD to augment scarce resources. Student interns helped handle clerical duties and special projects. Evaluation results indicated increased participation in IPD programs. Grants brought in funds to support programs. IPD was recognized by USDA as a strong, stable program.
Studying Abroad in Nepal: Understanding Impact on Student’s Lives
Patricia Farrell and Murari Suvedi
Michigan State University

Since the inception of the Michigan State University Nepal study abroad program, 139 students have traveled across the world to take part in a 12-week learning experience, taking courses in social science, arts and humanities, and international studies. In addition, students tour historical educational and cultural sites, conduct independent studies, and participate in weekly reflective learning sessions and journal writing. The study was conducted in order to analyze the potential impact on the 139 students who had participated in the program between 1997-2001, focusing on the student’s academic program, personal development (e.g., emotional maturity, empathy, flexibility), and intellectual development (e.g., critical thinking, problem solving) from their studying in Nepal. The study draws upon adult learning theory to analyze both the survey instrument data and case studies to highlight the potential impact on the lives of college students studying in a developing country. The Nepal program is especially unique because it is a semester-long program in a developing country that includes independent study work. Lastly, this study contributes to the body of knowledge on U.S. study abroad programs, especially because the longitudinal research on such programs is weak.

Partnering Across the U.S.-Mexico Border: Perceptions of Ranchers and Service Providers Concerning Technology-Transfer Activities in South Texas and Northeast Mexico
Wendy Folsom,
Food for the Hungry International, Pucallpa, Peru

Like many international borders, the border between the United States and Mexico divides one ecological region into two political regions. The similarities between the two sides of the border present opportunities for bi-national collaboration among members of the ranching industry. This study was developed as part of a collaborative project to improve long-term livestock production, forage production, and wildlife management in south Texas and northeast Mexico. The purpose of this bi-national study was to determine the type, nature, and extent of existing extension and technology-transfer activities provided to livestock producers, forage producers, and wildlife managers in south Texas and three states of northeast Mexico. The researcher from Texas A&M University and a co-principal investigator from the Universidad Autónoma de Tamaulipas, in Ciudad Victoria, Mexico worked together to conduct the study on both sides of the border. Data were collected in 2001 from 103 livestock producers, forage producers, and wildlife managers, and 55 forage-based service providers through personal interviews. Quantitative and qualitative methods were used to collect and analyze data. Among producers, the information most commonly used came from government or university sources in south Texas and livestock producers’ unions or associations in northeast Mexico. Service providers used a combination of mass media and interpersonal channels of communication, while producers more commonly used interpersonal channels of communication. Conclusions and recommendations were made based on these findings for use by individuals and organizations seeking to effect change among livestock producers, forage producers, and wildlife managers.
Assessing the Continued Leadership Education Needs of Adults Who Have Completed an Established In-depth Leadership Education Program

Susan M. Fritz, Susan N. Williams and John E. Barbuto, Jr.
University of Nebraska

Cooperative Extension has launched several leadership development initiatives varying in scope and intensity. This study used a needs assessment as the basis for identifying the continued leadership education needs of three groups of established leadership program alumni. A mailed survey was developed through focus group interviews of program alumni. The survey was distributed to all alumni (1,063) yielding 386 responses (36% response rate). Overall, Cronbach’s alpha reliability for the 18 topic items was .89. Respondents were most interested in training on the following topics: engaging others in a common vision; inspiring others; attracting the right people for the task; and influencing others. They overwhelmingly preferred to participate in one or two workshops per year. Face-to-face delivery was the format most preferred by respondents with distance-delivery strategies identified as the preferred means by 34% or less. Respondents having completed graduate degree programs identified several topics as significantly (.05) more or less helpful than respondents with bachelors, associates and high school degrees. Whether collaborating with alumni from their program or in conjunction with alumni of other programs, respondents preferred to pursue regional collaborations in their state. The results of this study will be used as a basis for developed advanced leadership develop training that will be marketed to alumni of leadership development programs offered through Cooperative Extension. It was recommended that this study be replicated with a group of community leaders that have not participated in formal leadership development program as the basis for developing initial and advanced training needs for program and non-program alumni.

Towards Participation in Technology Development and Technology-Transfer Programmes: A Case from Smallholder Researchers in the Deciduous Fruit Sector in South Africa

Tim Hart
Agricultural Research Council Infruitec-Nietvoorbij, Stellenbosch, South Africa

With the 1994 democratic election, the mandate of the Agricultural Research Council (ARC) and its institutes changed to reflect the changes in national agricultural policy, i.e., the provision of services and assistance to all farmers, with a special emphasis on the emerging smallholder farmers and the facilitation of their access to appropriate information and technology relating to sustainable production systems. The inclusion of black smallholder farmers was a new phenomenon for the ARC personnel and required a new approach to service delivery. The ARC personnel were mainly experienced in working with educated white commercial farmers who had access to a diverse range of resources, and who predominantly came from the same ethnic group and therefore had a similar cultural and social background to the researchers. With the change in policy, they were now required to work with farmers who were often culturally and ethnically different and who generally face a number of severe constraints as a result of their being historically neglected by the agricultural research and extension services and restrained by various government policies. ARC Infruitec-Nietvoorbij (one of the institutes of the ARC) focuses on deciduous fruit and vine crops. It attempted to accommodate these changes by adopting a more participatory approach to developing and transferring technology with smallholder farmers in South Africa. Such an approach is known internationally as Participatory Technology Development (PTD). This shift, which is not yet complete, was not without various obstacles and constraints.
**Rationale for Developing and Fostering a Global Perspective through a Required Graduate Course in Sustainable Extension and Rural Development Programs**

Marta M. Hartmann
University of Florida

The understanding of the interdependence of people, cultures, environments, and resources in addressing global issues is an imperative in the world-culture of the 21st Century. The development of a global perspective is a prerequisite in becoming a professional in a complexly interrelated and rapidly changing world. Traditional extension education approaches require modification to enable graduates to become globally competent in terms of outlooks and practices, and to succeed as leaders in a global context. The development and fostering of a global perspective, skills, and attitudes through a required academic course will empower extension graduates to develop, implement, and cultivate effective approaches and partnerships in sustainable agriculture and rural development programs. A brief description of the proposed course is included. The paper concludes with comments on the educational impact of the outlined course on a personal and professional level.

**The Role of Agricultural Extension in Transition Countries**

Stanley R. Johnson, Iowa State University
Tetyana Kalna-Dubinyuk, National Agricultural University of Ukraine, Kyiv, Ukraine

New transition countries in Central and Eastern Europe have been involved to varying degrees in a movement to democratic political systems and market economies. One of the important stages of this process is a transformation of the agricultural system, which brings agrarian reforms and restructuring to the economies of these countries. Perhaps agriculture has been the sector most impacted by the political and economic reforms. Many changes are required for the existing agricultural organization to evolve to meet the demands of the market. This has caused rapid change in rural populations, community viability and in the social and commercial infrastructure. The private sector of the economy has adapted and grown rapidly in the areas that support the new structure for agriculture, while the state sector has stagnated. In this transition, the role of Extension is becoming more recognized as important, especially for private farmers. Agricultural Extension represents an organization which can help people and communities to solve problems, increase agricultural productivity, create new products, protect animal and plant health, promote nutrition, strengthen children, youth and families, revitalize rural areas, and maximize the effectiveness of limited resources in cooperation with other countries. Creation of extension systems is already underway in these transition economies. There are more than 195 Extension systems in the nations of the global community. Transition countries are searching for Extension services with a market base and trying to find their own way in development of Extension systems that are in harmony with their national traditions and cultures. Like the situation in other nations, the Extension services in these nations will have special features and approaches.
Internships as Applied Academic Experiences
Lynn Jones, Chia-Hsing Wu and Tasha Hargrove
Iowa State University

Historically, internships have played an important role as a method of education. The early apprentice system, which can be traced back to the Babylonian Code of Hammurabi (2100 BC), allowed a young person to work closely with and learn from a skilled and knowledgeable master. The apprentice was allowed to undergo a process of observation, reasoning, articulation, and reflection, which entailed the mastery of particular techniques and skills associated with professional practice. Since that time, work-related experiential learning activities have been valued as a significant component of young adult education. Most people who have been associated with internship programs express their readiness to believe that internships are valuable to the student, the host agency, and the academic institution. One can unearth lots of anecdotal and metaphoric information about the effectiveness of internships. This research suggests that a good deal more "hard data" might prove useful, especially if it were to take the form of metrics for the Return-On-Investment.

Doing Participatory Research with Smallholder Farmers: The Identification and Process of an On-Farm Weed Management Trial
Marlise Joubert and Tim Hart
ARC Infruitec-Nietvoorbij, Stellenbosch, South Africa

In September 1999, researchers from the ARC Infruitec-Nietvoorbij established a Honeybush demonstration plot in Friemersheim with the local smallholder farmers. For various reasons, including conflict and weed management complications, this particular demonstration plot failed. During 2000, the researchers used Participatory Rural Appraisal (PRA) techniques to carry out a participatory appraisal with some of the farmers in Friemersheim. In some of the exercises, the farmers identified weeds as a big problem. At that stage, the researchers did not realise that the occurrence of weeds was such a big problem. At the time there was pressure to establish a second demonstration plot and the significance of the weeds was overlooked. In the months following the establishment of the second demonstration plot on a new site, the researchers and farmers observed that weeds and weed control were serious problems. Initially, the research team tried to solve the problem by explaining to the farmers what they had to do and they presented a training course on weed management. Upon reflection at the end of 2000, it seemed that this approach to technology transfer was ineffective. Continual interaction with the farmers made the researchers realise that the weed problems were affecting all the crops that the farmers were growing and not only the Honeybush plants. The researchers realised that more effort needed to put into understanding the problems with weeds in the community. A meeting was held with a couple of interested farmers and the decision was taken to carry out an on farm trial with two of the farmers. Various approaches to weed management were tried which included a control and various local practices as well as current scientific knowledge applications. Vegetables, the predominant crops favoured by local farmers, were used in the trials, which will continue for a period of three years.
Are Market Research and Extension Complementary?
Geoff Kaine and Denise Bewsell
University of New England

Current extension theory and practice in Australia seeks to promote the adoption of agricultural innovations by facilitating the personal development of farmers to create a culture of innovation and continuous learning. However, this approach has not eventuated in higher adoption rates. We propose that an alternative paradigm may offer some insights on this issue. In this paper, we explore consumer behaviour theory as a model of adoption behaviour in agriculture. Using consumer behaviour theory, we characterize the adoption as a form of high involvement purchasing that invokes complex decision making. This characterization suggests that producers derive purchase criteria for assessing innovations based on relevant elements of the existing mix of agricultural practices, techniques, and resources available to them. These elements define the farm context for the innovation – usage context in consumer theory parlance. Differences in farm context translate into differences in the purchase criteria used to assess an innovation. This leads to differences in the value of an innovation to producers and, therefore, differences in their propensity to adopt. In principle, producers can be classified into ‘market segments’ for an innovation based on similarities and differences in their purchase criteria for that innovation with predictable differences in the pattern of adoption of an innovation across segments. We have used this framework to identify ‘market segments’ for innovations in a range of industries. Differences in the pattern of adoption of innovations across segments were in line with expectations. We draw a number of implications for research and extension from our results.

Promoting Medicinal Plant Gardens: The Challenges to Successful Extension of New Practices to Traditional Healers in South Africa
Sebueng Kelatwang and Gustav H. Düvel
University of Pretoria, South Africa

Concerns about the unknown rate at which medicinal plants from communal land are disappearing and the consequent environmental implication thereof, has led to calls for cultivation of these plants in gardens by various agencies. Traditional healers, as the main users, are adopting the medicinal gardens concept at a very slow pace. The purpose of the research was to analyze the pattern of use of medicinal plants and identify constraints that affect the rate of adoption of growing medicinal plants in gardens. The results are expected to provide extension agencies with appropriate guidelines for promoting medicinal gardens more effectively in South Africa. The research took the form of a case study approach focusing on a specific area, with participatory and qualitative phases providing the basis for a semi-structured interview schedule, designed to assess the healers’ acceptability of medicinal gardens, their comparative perception of grown plants and collected plants, and constraints in the establishment of medicinal plant gardens. The results give an insight into the use and preferences of medicinal plants from various sources and, through an analysis of the comparative acceptability of grown and collected plants, identify constraints in the adoption of medicinal gardens. However, the secrecy surrounding the world of the traditional healers and the taboos associated with cultural customs and beliefs makes the access to the indigenous knowledge extremely difficult. It questions the validity of some of the traditional healers’ responses, and emphasizes the need for much more in-depth research.
Enriching the T&V Approach to Technology Transfer by Fusing the Roles of Researcher and Village Extension Worker
T.B. Khosa, W. Van Averbeke, R. Böhringer and Prof E Albertse
Technikon Pretoria, South Africa

A case study was conducted to find out if the problem of poor feedback from farmers to researchers, characteristic of the Training & Visit system of technology transfer, could be addressed by fusing the roles of researcher and extension worker. The study involved the transfer of the technology of vegetable production in home gardens using a micro-irrigation system to ten rural women living in an environment where malnutrition due to a lack of vegetables was a problem. Both the designer of the irrigation system, and the group of researchers who found the technology on the shelf, and thought it appropriate to solve the malnutrition problem, held particular views on how the technology would be adopted. The case study demonstrated that the assumptions of researchers were not always valid, explaining why recipients of technology diverged from the technology adoption scenario envisaged by the researchers. The study demonstrated how insights in the motivation behind the diverging scenarios might be used to refine technology, or to adapt the technology transfer package, in this case by including educational components. In South Africa, where both public research and extension systems are contracting because of reductions in budgetary allocation, the fusing of the roles of researcher and village extension worker might be used to maintain effectiveness in both systems. Adding research-training modules to the curricula of extension education could assist this process. These research-training modules should emphasise the use of farmer-friendly research approaches to ensure the unearthing of farmer perceptions, and the discovery of existing or emerging indigenous technology.

Agriculture Teachers' Attitudes toward Adult Agricultural Education in Ohio Comprehensive High Schools
Yung-Chul Kim and Larry E. Miller
The Ohio State University

The purpose of this study was to determine the attitudes of agriculture teachers concerning their adult agricultural education program activities in Ohio comprehensive high schools. A descriptive survey with a correlation component was conducted. Eighty-one randomly sampled teachers out of the target population (N=354) were drawn. A 6-point Likert-type scaled questionnaire was used to measure the attitudes. Data were collected through a mailed questionnaire. Descriptive statistics were used to summarize the data and correlations, t-tests, and ANOVAs were used to identify the relationship between the attitude and selected demographic characteristics. Only 39% of the respondents had an adult agricultural education program at their school currently. Teachers had an average of 15 years of teaching students and 4 years of teaching adults. Attitudes toward adult agricultural education were viewed as “positive” overall by the responding agriculture teachers. However, the teachers have perceived that time and funding were the major barriers, even if the need and benefits of the programs were great.
Partnership and Participation in Research and Extension: Supporting Farmer Innovation in Central Ghana
Margaret M. Kroma and Jun-Li Wang
Cornell University

This paper presents a case study of a collaborative, participatory research and extension project in natural resources management in central Ghana. It describes the learning process and organizational framework characterizing farmer innovation, and the democratic partnerships between farmers, researchers and extension agents, and other stakeholders in resource management. The case study builds on concepts in social learning theory to examine, within a particular natural resource management context, the potentials and transaction costs in facilitating a process of group learning in the management of technology innovation. The discussion has theoretical and practical implications for change agents working with poor farming communities in developing countries.

Use of Technology to Support Learning and Learning Retention for Participants in a Study Abroad Program
David Krueger and Luke Reese
Michigan State University

Interest in the role of experiential education on student learning has a rich history in agricultural and extension education. This interest has been fueled in recent years by findings from studies that link experiential learning to study abroad programs (Miller, 1999; Andreasen & Wu, 1999). The importance of experiential learning coupled with a greater number of students traveling abroad and enhanced technological advancements leads to many questions regarding how technology opportunities might be used for student learning. This research was conducted as an attempt to determine the value of using technology as a tool to enhance experiential learning while studying abroad. This qualitative study would indicate that the use of technology does support experiential learning theory and learning retention in a study abroad experience.

Rethinking Agricultural Education for Sustainable Development in Ghana
Joseph A. Kwarteng, University of Cape Coast, Cape Coast, Ghana
Michelle Owens, FAO Regional Office for Africa, Accra, Ghana
Ernest L. Okorley, University of Cape Coast, Cape Coast, Ghana

(No Abstract Available)
The Devastating Cost of Undervaluing People
Jacqueline E. LaMuth and Daney Jackson
Ohio State University Extension

Extension professionals historically have had limited interest in the cost of doing business because funding sources have been stable. Today, this is changing. Seeking external funding through grants and fees for educational services appears to be a viable option to find new monies. Extension professionals often see opportunities to fund programmatic growth in a simplistic way. What starts as a few hours invested in writing and submitting a project proposal can become a resource nightmare once the proposal is approved, the contract is signed, and the project begins. Poorly planned projects siphon off already committed resources, may lead to a decline in the quality of existing programs, and eventually cause the loss of on-going support. Extension professionals often lack experience with budgets and have little or no training to prepare them to calculate actual costs of a project. The sources and conditions of funding are changing and there is a growing need to integrate fixed costs of operation into individual projects, and are making it important to include individual programs and budgets as part of larger comprehensive budgets. With the addition of externally funded projects, Extension professionals are being forced to develop new managerial skills. The competencies that will be needed by the 21st century Extension professional are changing; Extension professionals must see themselves as program and resource managers rather than the direct deliverers of services; the kinds of professionals who are recruited, the training and re-training that is offered, and how performance is reviewed and rewarded must change.

Agricultural Education and Extension Facing a New Rural Milieu: Challenges for Brazilian Colleges of Agricultural Sciences
Francisco Carlos T. Leite and Rama B. Radhakrishna
The Pennsylvania State University

Remarkable transformations in the Brazilian agriculture and rural milieu are requiring a new kind of professional to face the emerging demands of a diverse, innovative, technological, and integrative agriculture and rural milieu. Colleges of Agricultural Sciences, as institutions devoted to prepare people to work in agricultural education, agricultural research, and rural extension, are challenged to redesign their practice and lead a movement to foster strong partnerships between themselves, agricultural schools, and agricultural research and extension institutions. The emergence of the National Forum of Extension’s Vice-Chancellors of Brazilian Public Universities in 1987 heralded a new era to foster changes from the universities standpoint. Such a Forum put extension in a prominent position into Brazilian public universities, as well as enforced the university’s tripartite mission - teaching, research, and extension. The new characteristics emerging in the Brazilian rural milieu and Boyer’s (1990) concept of scholarship are the background used in this study to build a conceptual model linking agricultural education, agricultural research, and rural extension.
A Cross-National Study of Agricultural Education Competencies

Participating Research Partners

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<tr>
<th>Name</th>
<th>University/Institution</th>
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<tr>
<td>James R. Lindner</td>
<td>Tanvir Ali</td>
<td>University of Agriculture, Faisalabad, Pakistan</td>
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<td>Texas A&amp;M University</td>
<td>Ahmad Shukri Al-Rimawi</td>
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The purpose of this research was to explore and describe perceived academic knowledge, skills, and abilities of Agricultural Education graduate students in cross-national settings to ascertain if the rankings of variables were consistent by country. Using an Internet questionnaire, data were collected by 23 researchers in 23 countries. One hundred and sixty-eight graduate students participated in the study. Study findings showed that most perceived competency rankings varied by country. Five competencies rankings tended to be consistent with respect to the national setting: Applications Knowledge that ranked second in four knowledge categories; Systems Skill that ranked sixth in seven skill categories; Technical Skill that ranked seventh in seven skill categories; Communication Abilities that ranked first in four ability categories; and Attentiveness & Quantitative Abilities that ranked fourth in four ability categories. Recommendations include increased professional conversations about agricultural education graduate student competencies in cross-national contexts and further study.
Farmers’ Communication Process: A Route to Sustainability
Josué López and Thomas H. Bruening
The Pennsylvania State University

In rural areas, the challenge is to increase the quantity and accessibility of information, to ensure its exchange in appropriate ways, and to elicit more information from rural people themselves in order to guide the planning of sustainable development programs. This study used participatory approaches to explore limited-resource farmer communication processes within their own context. All San Lázaro participants (100%) indicated that friends were the reference group they associated the most concerning agricultural practices. Eighty-four percent of the participants indicated that communication with their neighbor farmer was the type of communication most used regarding decision-making in production practices. Taking into account the views, capabilities, and needs of rural people as they see them is a key to develop meaningful communication strategies that lead to sustainable development. Communication processes among farmers need to be active so farmers can search for and select their own new technologies and practices. Helping people at all levels to communicate effectively empowers them to recognize important issues and find common grounds for action, and builds sense of identity and participation in order to implement decisions. Higher education institutions, and vocational schools in nearby San Lázaro village, should develop and modify curricula that use appropriate communication strategies, methods, and media to reach farmers and share information with them. Finally, extension educators should create linkages and enhance communication with/among farmers through curriculum development, training and workshops to meet farmer educational needs regarding agricultural sustainability.

We Are Not Your Grandfather’s Extension Service
Barbara G. Ludwig
The Ohio State University

Extension is becoming a system wanting to engage with people and communities in education on critical issues. It is an organization reaching out to a broader community. Shifting priorities in agricultural production and rural development demand new approaches. The outlook has changed. Consider the 2001 European Seminar on Extension Education held in the Netherlands. Conference topics ranged from organic farming and sustaining small farmers to countries in transition and extension systems in need of change. The issues faced by participants varied from safe food and water supplies to contested land use and the loss of viability in rural communities. These and related issues pose challenges for researchers, educators and facilitators involved in agriculture and rural development across the globe. In Ohio, we are experiencing similar challenges. In the past, our emphasis was on planting from fence row to fence row; relying on fertilizers, herbicides and insecticides to maximize yields. This is changing, and a new paradigm is emerging. Agricultural production and economic viability is not enough, environmental and social concerns related to agriculture and rural development demand attention and matter as much to the agricultural community as to the general public. This paper advances that social, economic, environmental, and production issues must be linked in defining problems and formulating solutions for agriculture and shares an approach being initiated in one land grant university.
Urban Farmers as an Extension Domain: The Case of Atteridgeville (Pretoria, South Africa)
M. J. Maswikaneng, W. Van Averbeke, R. Böhringer and Prof E. Albertse
Technikon Pretoria, South Africa

A study carried out in the informal urban settlements of Atteridgeville, Pretoria, involving a survey (n=120), which employed face-to-face interviews using a structured interview schedule, complemented by semi-structured interviews and observations of agricultural production activities sought to characterize urban farmers as an extension domain. In the study area, participation rates in urban farming were high (54% of households), and the majority of urban farmers consisted of unemployed middle-aged females, who tended to form part of households categorized as poor, and who had gained some experience in agriculture before their arrival in the township from rural areas. Agriculture was limited to crop and vegetable production, with livestock farming completely absent. Key constraints to urban farming in the area, currently and in the future, were the lack of secure land for agriculture and a lack of water. It is argued that these constraints may be addressed by closer involvement of government and the public sector, whose interventions may include the introduction of space-saving and water-saving technologies, whereby public extension could play an important role in technology transfer and farmer training.

Innovations Needed in the Swaziland Secondary School Agriculture Curriculum
Sibusiso T. Mbingo and Marietta P. Dlamini, University of Swaziland, Luyengo, Swaziland
Barnabas M. Dlamini, University of Botswana, Gaborone, Botswana

The study employed interview, nominal group technique and survey research procedures to determine curriculum content that should be incorporated in the secondary school agriculture curriculum. Stakeholders, including agricultural business managers, parents, curriculum developers, agriculture supervisors, teacher educators, teachers, and students, were the respondents to this study. The study revealed that 11 new areas/innovations and 18 existing areas were important to include in the conceived agriculture curriculum for secondary schools in Swaziland. The demographic characteristics of the respondents were found not to be confounding the results of the study. A composite new curriculum model was developed and proposed. The study identified 13 ranked content areas for in-service training of agriculture teachers.

Levels of Cognition of Instruction and of Students’ Reflective Thinking in a Selected Web-Enhanced Course
Larry E. Miller, The Ohio State University
Kai-ning Kao, Taipei, Taiwan

The development of cognitive instruction, critical thinking, higher level of thinking and problem solving ability has been of great concern in the recent past. Based on the cognitive education literature, a successful distance education program should be able to provide high quality instruction. One way to examine the quality of instruction would be to assess the cognitive levels of the web-based distance education program. In this study, the modified version of Newcomb and Trefz’s taxonomy was used to assess the level of cognition of teaching materials of the web-based course. They developed a modified version of Bloom’s taxonomy, which included four specific levels: remembering, processing, creating, and evaluating. The purpose of this study was to describe and compare the cognitive level of instruction of one selected web-enhanced course and the cognitive level of students’ reflective thinking. Findings of the study indicated that the “processing” level was the most commonly utilized level in the classroom and in the on-line environment. A training program is recommended for teachers who will teach a web-enhanced or web-based course. The program should contain: (1) the familiarity with the technology, (2) on-line class management skills and (3) pedagogical training, such as: higher cognitive level of teaching and the objective classification system. A future study was suggested to observe some other aspects of communication between teachers and students other than on-line course content and discussion forum, such as: chat room, emails, or some other communication channels.
Induction Needs of Beginning Agriculture Teachers in Community Junior Secondary Schools in Botswana
Olivia S. Mokgatle, University of Botswana, Gaborone, Botswana
David G. Acker, Iowa State University

The purpose of this study was to identify the induction support needs of beginning agriculture teachers in community junior secondary schools in Botswana. Among the forms of induction support perceived by beginning teachers as important were a mentor teacher, opportunity to observe other teachers teaching, feedback from the school head/senior teacher, and provision of induction support throughout the first year of teaching. The findings of this study also revealed that the forms of induction assistance that were offered most frequently were those that the beginning teachers did not perceive as important. The forms of assistance that were perceived by teachers to be of major or critical importance did not occur at all or occurred infrequently. The most fundamental forms of support needs were not being met, such as provision of a mentor teacher, evaluation feedback, lesson observations, reduced workload, beginning teachers handbook, in-service training on time management and most importantly, provision of continued support throughout the first year of teaching.

Factors Related to Zimbabwe Women’s Educational Needs in Agriculture
Anna E. Mudukuti, Zayed University, Abu Dhabi, UAE
Larry Miller, The Ohio State University

The purpose of this study was to identify the perceived educational needs and perceived barriers to Extension participation of rural women in Shurugwi District, Zimbabwe. Data were collected from 377 rural women using face-to-face interviews. Perceived educational needs were assessed using the Borich needs assessment model. Analysis of data used a Statistical Package for Social Sciences (SPSS). Findings revealed that rural women’s highest educational needs were in nutrition, access to land, and credit. A majority of the women in this study did not own land as individuals. Therefore, women continue to have poor control over a range of resources. Seven items in the area of nutrition and six items in the area of access to land and credit were among the top 16 ranked very high educational needs. The findings indicated that these two areas are the major educational priority for respondents. Educational courses should be planned that meet the identified needs of the rural women. Findings of this study can help AGRITEX in placing its priorities on the items that were ranked high to meet the needs of rural women, attract a wider audience, and lead to the success of Extension programs in Zimbabwe. Outstanding barriers to Extension participation were transportation, lack of information, and time constraints. Perceived educational needs scores and the selected demographic characteristic were independent of one another. The selected demographic characteristics of the participants failed to predict the needs of rural women, giving the possibility of drawing a conclusion that in principle Shurugwi rural women were similar.
Designing Effective Linkages for Sustainable Agricultural Extension Information Systems among Developing Countries in Sub-Saharan Africa
Catherine N. Munyua, Phyllis F. Adams and Joan S. Thomson
The Pennsylvania State University

Agricultural extension is the primary delivery system for information to farmers. Improving agricultural production may not be achieved without relevant and reliable agricultural information. In sub-Saharan countries, extension is a public service reaching out to a mostly subsistence farming population. The subsistence nature of farming in sub-Saharan countries justifies government intervention through public extension systems. To fulfill its mission of effectively educating and facilitating learning among farmers, extension organizations have depended on research institutions to provide relevant and reliable information on improved technologies and practices. The research-extension linkage, however, has been weak and is an institutional problem yet to be resolved. Exploring and institutionalizing linkages with other institutions is a strategy that extension organizations can use to keep current with new information. Farmers, universities and colleges, private organizations, and non-governmental organizations have not been fully acknowledged as potential information sources by extension organizations. Any existing relationships among extension and these institutions have been informal and indirect. These institutions, however, are rich in knowledge and information. They also provide dynamism in information generation that can greatly enhance agricultural extension information needs and subsequently improve services provided to farmers.

Strategies to Enhance International Agricultural and Extension Education: A Problem-Based Approach to Instructional Design
Theresa Pesl Murphrey and James E. Christiansen
Texas A&M University

The need for more people to understand how other cultures think is an integral part of education (American Council on Education, 1998); however, meeting this need requires innovative approaches. A study conducted by Redmann, Schupp, and Richardson (1998) found that workshops held to foster awareness of global agricultural environments had limited success. Technology is offering new ways to meet the need to prepare people to manage projects both domestically and internationally by providing access to multi-media for problem-based learning that can be an effective means to encourage retention and transfer of knowledge. Involvement in international agricultural development activities at a distance can be costly, time consuming, and can involve risks. The purpose of this study was to evaluate a computer-based learning activity that focused on solving a management problem faced by an expatriate working in international agricultural development. The educational importance of this study focuses on two areas: need for training in international development and potential for educators to use the approach studied. This activity provides students the opportunity to test their knowledge and skills without actually leaving their home country. Evaluation and synthesis of the responses revealed that the predominant reaction to the activity was positive. Students indicated that they “liked researching through all the extra materials to find common threads” and “liked the voices and the pictures — it makes it so real.”
Extension Staffs' Perceptions of Factors Affecting Coordination and Partnerships in Agricultural Extension Services in Rakai District, Uganda

Edison E. Mwanje, Makerere University, Kampala, Uganda
Gustav H. Düvel, University of Pretoria, South Africa
Margaret N. Mangheni, Makerere University, Kampala, Uganda

In Uganda's Rakai District (with a population of about 400,000), there are over a dozen organizations involved in delivery of agricultural extension services. To improve service delivery, a model for inter-organizational coordination of extension services is proposed. The model stipulates that coordination depends on: (a) perception of need for coordination, (b) planning for coordination, (c) communication and information systems, and (d) organizational and societal structures. The model is used to design a survey instrument to determine factors affecting coordination of agricultural extension services in the District. All extension staffs (N=173) were requested to complete a questionnaire that was developed after discussions with selected extension staffs, farmers, and extension and local leaders. Results, from 149 respondents (86% response rate), are summarised as follows: The most outstanding means of coordination that were used by extension organizations in the District include: (a) working with farmer development committees; (b) involving politicians in planning; (c) strengthening relevant associations; and (d) coordination mechanisms at the District level. Various reasons why coordination was important were identified, notably the following: (a) harmonization of programmes to avoid duplication of services; (b) sharing of experiences for effective and efficient service delivery; (c) development of systematic procedures for delivery of services; (d) it minimizes wastage of resources. Finally, the following recommendations for improving coordination were perceived as the most efficacious: (a) harmonization of plans among organizations to avoid contradictions, duplications, or conflicts; (b) establishing a common forum for exchange of information; (c) establishing co-ordination mechanisms at District, sub-county and parish levels.

Hope and Despair: Extension Agents in a Young Democracy

Tsakani Ngomane and Constance Flanagan
The Pennsylvania State University

The nation of South Africa during this critical transition period of economic growth and poverty alleviation provides an intriguing case study of the importance of coordination between government, civil society, and the community for sustainable service delivery. The determination of extension agents to facilitate the success of the young democracy is thwarted by numerous field and institutional challenges that others observed and documented while the status quo remained. This paper provides a rare insight into a new discourse of extension as paragons of citizenship, patriotism, and nationalism. Properly approached, extension service can help unlock the service delivery cul-de-sac.
An Analysis of the Characteristics and Constraints of Small Holder Commercial Farmers in the Transkei Region, Eastern Cape, South Africa

Sivelile Nompozolo, Faculty of Agriculture, University of Fort Hare, South Africa
Chris O. Igodan, Director, Ohio State ATI

With a total population of about 3.5 million, most of whom live in rural areas, Transkei is a net importer of agricultural products, including maize, and agricultural income provides only a tiny proportion of total household income. Macro-livestock (cattle, sheep and goats) production was involved in 42% of these enterprises and accounted for 50% or more of gross cash sales in about the same proportion of enterprises, indicating the dominant commercial and cultural role of these livestock in Transkei. Micro-livestock (poultry and pigs) comprised the dominant production class in about one fourth of the enterprises, field crops and vegetables were dominant in 20% and 11% respectively. Of 128 farm enterprises, only 14 (11%) owned their own farm lands, 39% were farming on leased lands, and an equal proportion were located on communal lands. Of 132 reporting farmers, 71% were male and the households had income from salaries or wages and only 28% reported that 50% or more of total household income was derived from agricultural sources. Only about 15% of the interviewed farmers had electricity to their residences. 73% of respondents reported extension to be most useful source of information while 27% considered radio programmes to be more useful. Transkei farmers marketed their crops directly to the consumers. Gross annual crop sales of as high as R160 000 were reported. Mean annual sales of livestock was R9 000. Average annual income from poultry sales was R6818, from eggs was only R333 Pig sales averaged R3700 with the maximum being R17000

Promoting Participatory Technology Development Approach in Integrated Crop Protection Among Tomato Farmers in Anyima in the Kintapo District of Brong Ahafo Region, Ghana

E. L. Okorley, M. M. Zinnah and E. A. Bampoe
University of Cape Coast, Cape Coast, Ghana

The Ghanaian public and government have come to realize that the use of chemical pesticides by vegetable farmers to control pests and diseases in the country is increasing and if agricultural production is to be sustainable and safe to humans and the environment, then intensive farming systems should become less dependent on chemical pesticides. The top-down approach characterizes most of the interventions that have attempted to address this production constraint of vegetable farmers in Ghana. The farmers have not been fully involved in the process of developing technological options which can help produce healthy vegetables at the same time sustaining the environment. The research was a collaboration between the Department of Agricultural Economics and Extension of the University of Cape Coast and GTZ/Ministry of Food and Agriculture (MOFA) Project. It was an Action Research, which experimented on Integrated Crop Protection (ICP) strategies using participatory approaches among farmers in Anyima in the Brong Ahafo Region of Ghana. The concern is that agriculture is becoming more and more complex and any intervention aimed at assisting farmers to manage crops efficiently must be holistic in nature. It should integrate the major cultural practices of farmers. Vegetable farmers in Anyima are aware of the practices of ICP but their 28% reported that 50% or more of total household income was derived from agricultural sources. Only about 15% of the interviewed farmers had electricity to their residences. 73% of respondents reported extension to be most useful source of information while 27% considered radio programmes to be more useful. Transkei farmers marketed their crops directly to the consumers. Gross annual crop sales of as high as R160 000 were reported. Mean annual sales of livestock was R9 000. Average annual income from poultry sales was R6818, from eggs was only R333 Pig sales averaged R3700 with the maximum being R17000
The Biotech Debate: Using the Public Relations Classroom as a Forum to Assess Changes in Attitude
Michelle O'Malley, Kansas State University
Tom Kelleher, University of Hawaii

Public relations students at Kansas State University and the University of Hawaii participated in a collaborative project that was designed to have students develop a public relations issue statement for their assigned client. Student attitudes were assessed before, directly following, and seven weeks after completion of the project. The students were randomly assigned to groups and to an organic or biotech client (treatment). Participants’ attitudes about using agricultural biotechnology to reduce the need for pesticides, to improve nutritional content, to improve taste in food, to increase crop yield, and to solve problems related to overpopulation in the Third World were measured with four-item scales. Students were asked to indicate their level of agreement on a seven-point response scale with statements that biotech is useful for society, is risky for society (reverse coded), is morally acceptable, and should be supported. Responses to these four items were combined to create the dependent measures. The 2(KSU/Hawaii) x 2(GMO/Organic) x 3(Time) model was analyzed with repeated measures ANOVAs. There was a significant interaction effect for time and treatment for reducing the needs for pesticides, increasing crop yield, and improving taste. A main effect was found for the treatment effect on need for pesticides and crop yield. For crop yield, an interaction effect between time and school also was found. Students’ perceived understanding of biotechnology was also measured and showed significant increases from T1 to T3.

Evaluation Planning, Design, and Implementation in a Regional Sustainable Agricultural Extension (SARE) Program
John M. O’Sullivan, Cooperative Extension Program, NCA&TSU
Rita G. O’Sullivan, University of North Carolina Chapel Hill

Evaluation of agricultural development and sustainability efforts can be a difficult challenge. Evaluation itself is not well understood in the agricultural community. Successful design and implementation of evaluation is tricky because impacts are diffuse. Collaborative evaluation is an evaluation model that addresses these problems by incorporating diffuse stakeholders in the evaluation process. The paper discusses collaborative evaluation. It then describes the process if designing and implementing a collaborative evaluation process. The example of the Southern Region (USA) SARE (Sustainable Agriculture Research & Education) Program Professional Development Program is used as a case study. Over the period of 1999-2001, an evaluation process was designed and implementation begun.

An Assessment of Contact Farmers’ Educational Activities in Iran (A National Study)
Gholamreza Pezeshki-Raad, Tarbiat Modaress University, Tehran, Iran
Hossein Agahi, Razi University, Kermanshah, Iran

This study examined the educational activities of contact farmers (CFs) in Iran. Objectives of the study were to: 1) Assess the current technical educational programming being offered to CFs, 2) Identify CFs future technical educational needs, 3) determine CFs preference of extension teaching methods. A stratified random sample of 310 CFs was selected. Data were collected through a structured interview method with a 100 percent response rate. Findings indicated: 1) the greatest importance of technical educational programs were soil fertility and crop varieties; 2) the program area with a greatest interest for future delivery was optimum use of pesticide and fertilizer followed by agricultural mechanization and marketing of agricultural products; 3) teaching methods preferred by CFs for future delivery were farm visits, followed by visiting progressive farmers, extension publications, and video films.
Teaching to Learning: IT in Education
James Phelan and Dermot Ruane
The National University of Ireland, Dublin, Ireland

Educational institutions are facing new challenges. The demand for traditional ‘teaching’ methods is now being replaced by a move towards a student-centred ‘learning’ environment. The traditional student population in Europe is estimated to decline by 20% by 2015; however, the demand for lifelong learning is increasing, thus diversifying the student base. In addition, current technological developments will have a big impact on the future direction of extension and rural development education programmes. Web-based learning technologies are now in place and increasing numbers of courses are being offered through this medium. While significant developments have taken place on the technology side, similar efforts regarding the development of curricula have not occurred. This paper reports on research carried out in Ireland, Greece, and the United Kingdom, the objective of which was to research, design, pilot, and evaluate a distance learning module in project management. The project was evaluated internally by participants and tutors and externally by an independent evaluator. The results indicate that online learning offers real potential for future learning, particularly in a rural development context where distance from an education centre is a severe disadvantage. However, it will never replace the class dynamic that is a critical component of the learning environment.

Revitalizing Agricultural Extension Curricula in the 21st Century: Implications for Indian Agricultural Universities
Rama B. Radhakrishna, The Pennsylvania State University
V. Veerabhadraiah, University of Agricultural Sciences, Bangalore, India

Agricultural universities modeled on the tripartite mission of the U.S. land grant system were established in India to produce the technical manpower needed through education. India has achieved significant progress in agricultural development leading to self-sufficiency in food production. Far-reaching changes have occurred in Indian agriculture since 1991 under the new economic policy, globalization, and World Trade Organization. As a result of these rapid changes, a need exists for reexamining the agricultural extension curricula to meet the challenges of the 21st century.

ASEAN/USDA Entrepreneurship Development
Arlen Etling, University of Nebraska
Carol Radomski, CSREES/USDA International Programs
Mark Holt, FAS/USDA
Beng Paik, Malaysian Ministry of Agriculture

Entrepreneurship in agriculture is needed in Southeast Asia as well as the United States as these countries deal with urbanization and globalization. This case study is about a proposal development process that used collaborative techniques. It culminated in a proposal for an international entrepreneurship training program for Asian countries and the U.S. The participants in this proposal development process were representatives of ASEAN (Association of Southeast Asian Nations), USDA-Foreign Agricultural Service, USDA-Cooperative State Research, Education and Extension Service, and the land grant universities. The participants used a set of “project development principles” to encourage collaboration among equals. They visited young entrepreneurs and extension agents at sites all over Malaysia. Then they constructed a proposed project to respond to the needs they had observed. A “logic model” was used to promote clarity. Consensus decision-making was used and project design components were reviewed by department heads of the Malaysian Ministry of Agriculture and by officials of the U.S. Department of Agriculture. The participants proposed a five-year program of multi-national entrepreneurship training, local follow-up, and internships with support by electronic communications, leadership training, and organizational development. The proposal is ready for funding. Once funded, it will provide opportunities for land grant universities to participate and receive part of the funding.
Assessing Farmers' Sustainable Agricultural Practice Needs: Implication for a Sustainable Farming System
Hassan Sadighi
Tarbiat Modarres University, Tehran, Iran

The primary purpose of this study was to assess the farmers' sustainable agricultural practice needs (SAPN) as determined conversely by their level of technical knowledge and understanding on sustainable corn farming practices. The population of this study consisted of all corn growers in Fars, a southern province of Iran. A questionnaire was developed to gather required information from 159 randomly selected farmers. In order to reduce the data collection error, a uniform interview technique was adopted and the questionnaire was used, as a guide to collect needed information from sampled farmers. The SAPN was the dependent variable of the study. Farmer’s demographic and professional characteristics, including their level of technical knowledge, access to information source, and mechanization practice level were considered to be independent variables of the study. The result showed that considerable numbers of farmers (46%) have a "high" level of needs concerning sustainable agricultural practice. The farmers' level of technical knowledge showed to have a substantial (r= -.64) and negative association with their SAPNs. Multivariate linear regression analysis indicated that 49.3% (R²=0.493) of the variance in SAPNs could be explained by the farmers' age, their access to the information sources, and their level of technical knowledge. This implied that a substantial amount of variability (about 51%) in SAPNs is explained by other variables that were not studied in this research. Further study is needed to determine factors affecting SAPNs and their extent of impact. Substantial educational work needs to be carried out by the extension specialists in order to increase adoption of sustainable technologies among farmers. Increasing farmers' technical knowledge concerning maize farming is necessary in order to lower the farmers' needs regarding sustainable agricultural practices.

Adapting Elements of the US and UK Extension Systems to a Chinese Market-Based Model
Xiaorong Shao and Thomas H. Bruening
The Pennsylvania State University

The agricultural extension system in China has gradually transformed from being administration oriented to income-generation oriented under a market-based economy. The current extension system addresses the importance of rural development in view of China’s overall economic development and this change reflects decentralization, cooperation, and commercialization in the system. Today, individual farmers and households have become more effective producers and better decision-makers compared to the directed labor force in the centrally planned economy. The government has, to certain extent, given up its centralized planning function. This paper is intended to provide insights to the changes in the extension system in China due to the evolving economic reforms. The mission and goals as well as four major extension approaches are discussed in this paper. By highlighting the features of US and UK extension systems, it is proposed that some of these new elements could be adapted into the evolving extension systems in China.
Farmer Field Schools and the Future of Agricultural Extension in Africa
Brent M. Simpson, Michigan State University
Michelle Owens, FAO Regional Office for Africa, Accra, Ghana

The continuing saga of efforts to stimulate economic growth in Africa through agricultural development reflects the rise and fall of the many ‘fads and fashions’ in international development over the past 50 years. Following the poor performance of rural development projects to significantly improve the welfare of the rural poor through the mid-1980s, the region has witnessed an almost universal abandonment of support for large-scale, state-run extension programs. After pursuing alternative policies, such as support of non-governmental organizations and, to a lesser extent, producer associations, a growing number of donors and governments have shown an interest in a renewed backing of state-sponsored agricultural extension programs. Recently, interest has begun to coalesce around the potentials offered by the Farmer Field School (FFS) approach. Included in this paper is a brief look at some of the key elements in the FFS approach, its transfer to Africa, and some notes on the source of information used in this paper. The results and conclusions center around 6 key issues: the responsiveness of the FFS approach to local conditions; FFS achievements in instilling systems learning and generation of new knowledge; facilitation of farmer-to-farmer information exchange; local institutionalization; impact on relationships between farmers, extension, and other stakeholders; and the specific challenges faced by extension programs in integrating the approach into their programs. Some concluding observations are made on the progress, pitfalls, and potentials of the FFS approach to fill a significant role in the revitalization of national extension programs within the region.

Strategies for Enhancing Women's Full Participation in Sustainable Agricultural Development and Environmental Preservation in Sub-Saharan Africa
P. J. Squire
Botswana College of Agriculture, Gaborone, Botswana

The paper reviews the impact of selected barriers on women farmers’ full participation in sustainable agricultural development and environmental preservation in sub-Saharan Africa. It is recommended that a holistic and integrated approach be taken, including promoting gender equality in access to educational opportunities and training programs for women and girls; women be a part of a policy and decision-making process at all levels in the national and rural agricultural sectors; and that they be given access to other programs and other facilities that focus on the needs of women in agriculture and their other multiple roles, to enhance sustainable agricultural production and environmental preservation in sub-Saharan Africa.
Strengthening Human Capacities for Implementing a New Demand-Driven Extension Approach in Eritrea
Roger E Steele
Ithaca, New York

The new government in Eritrea, acting consistently with its philosophy of decentralization, recently undertook a broad-based participatory process that resulted in the country’s first comprehensive Agricultural Sector Review. That review identified needs for coordinated donor support to develop agricultural research and extension. In the early months of 2000, during the course of field visits, a strategy team made assessment and problem analysis of the prevailing farming conditions in order to recommend possible extension approaches. Eritreans chose the term “Farmers’ Advisory Service” (FAS) as the name for their new extension service. In choosing FAS, Eritreans were recognizing the importance of positively influencing human behavior as a means for bringing about change. The new extension approach is intended to be participatory, grassroots, and focused on demand generated by farmers. It is designed to relocate more of the most qualified extensionists to jobs that allow them to have maximum accessibility by farmers. Perhaps most urgently, Eritrea needs a human capacity approach that builds more equity for women. Another priority is to improve agricultural and extension education, especially at the diploma level. All of the formal and nonformal educational approaches must be tailored to prepare extension workers with social skills to complement their competence in relevant technical knowledge and skills. Eritreans have reason to feel optimistic about improving their country if they can be successful at equipping an extension work force that is increasingly practical, more able to work in interdisciplinary teams, and better resembles the diversity of the populations being served. Some of the information in this paper was adapted, with permission, from documents prepared by the author for the Ministry of Agriculture in Eritrea in collaboration with the University of Asmara in Eritrea and with the assistance of personnel from DANIDA and FAO.

Perception of Researchers in Botswana College of Agriculture (BCA) and Department of Agricultural Research (DAR) Regarding the Usefulness of Information Technology in Agricultural Research in Botswana
Stephen Kayode Subair, University of Botswana, Gaborone, Botswana
Florence Kgankenna, Gaborone Senior Secondary School, Gaborone, Botswana

This census study was conducted to find out the status of Information Technology among all the 54 lecturers of Botswana College of Agriculture (BCA) and 34 Researchers of Department of Agricultural Research (DAR) in Botswana. Statements in the questionnaire were developed around the domains which literature has asserted could contribute to the status of Information Technology in Botswana. Respondents were asked to indicate their level of responses along a five point Likert scale. The statements in the domains were validated and the reliability estimates calculated and found to range between 0.71 - 0.91, indicating a very good degree of reliability. The data collected were analyzed using frequencies, means, percentages, and rankings as the case may demand. The statistical “t” test was used to compare the means of some personal characteristics of the respondents and their perceptions towards the statements in some of the domains examined. The study found out that the researchers agree that Information Technology is useful in agricultural research. Technologies such as video conferencing/compressed videos, satellite down-link, and laser disc players were not available to most of the researchers in the two institutions. Most researchers had computers available in their offices or institutions with multimedia capabilities, World Wide Web, and Internet e-mail.
Asset Mapping: A Useful Methodology to Plan Systematically Extension Programs for Sustainable Rural Economic Development
Burton E. Swanson and Mohamed M. Samy
University of Illinois at Urbana-Champaign

The main objective of this paper is to describe and empirically demonstrate the use of Geographic Information Systems (GIS) tools in an innovative asset-mapping methodology. GIS asset-mapping methods and tools can help extension personnel in program planning and in assisting farmers in determining comparative advantage for different value-added products within their respective communities. This type of analysis allows farmers and agricultural leaders to see the “big picture” with respect to their strategic assets as they consider whether to pursue value-added opportunities and work toward sustainable rural economic development. The primary and secondary data presented in this paper were collected and compiled during 1998-2001 to create a GIS spatial database for use in asset-mapping. Two types of findings are presented. First, exogenous and endogenous assets, pertaining to value-enhanced farm products in different Illinois eco-regions, are identified and selected examples illustrated. Endogenous assets included factors such as farmers’ skills, resources, and willingness to join and/or invest in value-added endeavors. Exogenous factors included domestic and international markets, natural resources and infrastructure. Second, using these GIS tools strategic assets can be displayed through a series of layered spatial outputs that can be scaled to county, eco-region, and/or state levels of analysis.

What is the Role of Extension Educators in the First Decade of the 21st Century?
Jerold R. Thomas and Daney G. Jackson
Ohio State University Extension

Cooperative Extension in Ohio and throughout the world faces many challenges due to technology, globalization, changing economies, sustainable development, and other issues. Trends in these and other areas are analyzed and then implications for Cooperative Extension are then provided. The paper uses the state of Ohio from the United States as an example, but most of the trends and implications are global in their nature. Among the implications are the need to move beyond just being information providers and the need to use Boyer’s example of scholarship.

Indigenous Technology and Technology-Oriented Research: Implications for Research Methodology
W. Van Averbeke
Department of Agricultural Management, Technikon Pretoria, South Africa

A case study involving a review of research into crop production in the Transkei region, which shows that intercropping and nutrient supply practices are closely linked to the single-furrow planter technology employed by a large number of local smallholders, demonstrates that indigenous knowledge and technology indeed exist among African smallholders in South Africa, and that their discovery can add considerably to the relevance and social value of smallholder-oriented research, when used as a base to formulate technological research questions, which address the problems and needs of farmers. To discover indigenous knowledge and technology, agricultural researchers in South Africa are advised to expand their methodological tools beyond quantitative research techniques, and adopt techniques, which traditionally are the domain of social scientists in general, and anthropologists in particular. It is suggested that participant observation is particularly well suited for this purpose. Broadening the scope of the research methodology courses offered to agricultural scientists, to include qualitative research methods, is recommended.
Using a Systems Analysis Framework to Improve Performance of the Ukrainian Center for Private Farmer Training and Outreach
Satish Verma, LSU Agricultural Center
Larry Brock, U.S. Project Coordinator
Grigoriy Loyanich, Ukrainian Project Coordinator
Wanda Yamkovenko, Project Associate
Lakshman Velupillai, Ukrainian Center for Private Farmer Training and Outreach, Vinnitsa, Ukraine

A systems-based, two-dimensional matrix was used to analyze the organizational performance at the midpoint of a three-year USAID-funded private farmer training and outreach project established at a state agricultural university in Ukraine in collaboration with a US land grant university. Responses of project faculty and administrators to a set of 30 identical questions grouped under five performance variables - mission/goals, system design, capacity, motivation, expertise – were obtained through personal interviews. An interpreter assisted with translation, notes were made, and the interviews audio taped. Significant performance problems revealed included a hierarchical organization structure unsuited to responsive and relevant extension programming, issues of personnel workload, supervision, coordination and support, lack of clear, facilitative, and well-understood personnel and programming policies and procedures, unilateral decision making, lack of job mobility and enrichment, and salary and compensation inequities. Solution strategies to address the performance problems suggested are development of written documentation on personnel management and program development policies and procedures, development of needed educational curricula, and various measures to enhance human performance.

An Introduction to Risk Communication for International Agricultural and Extension Educators
Michael D. Woods and Cathy Pisano
Michigan State University

Interest in risk communication by Extension has mushroomed in recent years (Hutcheson, 1999). One explanation for this increased interest is the passage of right-to-know laws related to exposures to agricultural and environmental risk agents. Another stems from increased public fear and concern about exposure to agricultural and environmental risk agents and the corresponding demand for risk information. A third reason is the increased number of media reports focused on agricultural and environmental issues. The fourth reason underlies the first three - the loss of trust in government and industry as credible sources of information about agricultural and environmental risks.

The purpose of this report is to review the main findings from literature on risk, risk perceptions, and risk communication. The objective is to provide the agricultural and Extension educator with a general outline of the literature on risk communication and to relate this research to specific techniques and approaches that can be put into practice for building international partnerships for sustainable Extension and rural development.
Sustainable Extension: Not Transformation, but Renewal
Steve Worth
Australia

While South African agriculture has achieved great successes, including a foundation for national food security, millions of rural South Africans experience chronic food insecurity and poverty. While agricultural policies have been formulated to address these issues, it is proposed that, unless the extension approach employed in South Africa is radically altered, the intent of these policies will not be realized. This paper presents a “renewal model” for extension called Agriflection. The model incorporates key and essential elements of sustainable, people-centered development as enshrined in the ethos of the South African Constitution. It reflects the growing mass of evidence advocating an iterative, incremental, reflective development process based on assets, partnerships, and a genuine commitment to learning. The model both identifies the partnerships and determines the development pathway. The aim of the paper is to evoke a serious re-think of the extension approaches employed by agricultural service providers in South Africa and to alert relevant educational institutions to the need to re-visit the assumptions, content, and methodology pertaining to their respective curricula aimed at equipping agricultural scientists and field practitioners with the skills needed to address the exigencies of South African agricultural reform. Further, the Agriflection model presents both the theoretical and practical markers needed for this action. The paper challenges agricultural service providers and tertiary institutions to take on the sizeable, but not unrealizable task of reviewing, renewing, and implementing curricula for the training and education of new breed of extensionists called “Agriflectionists.”

Some Reflections on the PRA Approach as a Participatory Inquiry for Sustainable Rural Development: An Iranian perspective
Kiumars Zarafshani
Razi University, Kermanshah, Islamic Republic of Iran

Participatory Rural Appraisal (PRA), a qualitative survey methodology, is being increasingly utilized in third world situations to formulate better the problems and identify opportunities for sustainable rural development. In Iran, there have been few recent innovations in research methodologies and in the processes by which sustainable rural development problems are formulated despite the increasing complexity of the problems being encountered. PRA in Iran has gained in popularity over the last decade and now presents a viable challenge to the traditional methods of rural development planning. This paper explores the idea of PRA as an effective tool for sustaining extension and rural development. It is suggested that the concepts which underpin PRA and the range and richness of techniques make it a relevant tool for empowering the watershed farmers in the western province of Iran.
A Practical Approach to Future Municipal Solid Waste Management in Developing Countries - A Closer Look at Georgetown, Guyana
Anita Závodská, Sonora Environmental Research Institute, Inc., Tucson, AZ
James Knight, The University of Arizona

The need for proper municipal solid waste management (MSWM) in developing countries is obvious as the effects on the environment and public health can be more profound there. Waterborne diseases and the proliferation of disease-carrying vectors associated with solid waste only increase due to improper sanitation and pollution management, and have resulted in many illnesses and deaths in developing countries throughout Asia, Africa, and Latin America. Therefore, good MSWM will help immensely in proper sanitation while solving the problem for many citizens of having to deal with waste disposal on their own. Benefits of better MSWM also include improved environmental conditions and an improved economic status with savings in the long-term development of MSWM. The underlying purpose of this study was to develop a conceptual methodology for MSWM strategies in developing nations while demonstrating the ability to make sound and practical decisions with limited and constrained data in the present and in the future. The methodology that was developed is specific in its recommendations to Guyana, yet it is generic enough to be modified and applied to any situation in other developing countries with similar characteristics. The final product of the study was a quick, practical, cost-effective, and environmentally sound ten-point checklist that could be followed by solid waste planners in developing countries.
Pre-Conference Leadership Team Meeting Minutes (Unofficial)
Sunday, May 26, 2002
Durban, South Africa

The meeting was called to order by President John Richardson at the Holiday Inn in Durban, South Africa.

Those present included; John Richardson, Gustav Düvel, Steve Jones, Frank Brewer, Jack Elliot, James Knight, Jim Diamond, James Christiansen, Michelle Owens, Wade Miller, Kristin Davis, Gary Wingenbach, Jimmy Lindner, Ben Stevens and Barbara Ludwig.

Steve Jones reported 109 officially registered for the AIAEE Conference including 19 guests/spouses. Steve indicated that we had no written cancellation policy for Conference registrants, but one should be addressed in the future due to unplanned cancellations at this conference. It was determined that at future conferences that if requested 30 days prior to the event, a full refund of Conference registration fees be given and for less than 30 days, one-half of the conference registration fees be returned. Motion Passed.

Ben Stevens reported that 189 SASAE members had registered and more were expected to bring the total to over 200.

Election Results were reported as follows:

- President-elect – Steve Jones
- Secretary – Frank Brewer
- Treasurer – Nick Place
- Board Member at Large – Michelle Owens

It was reported that over 40% of the membership returned ballots for the election. This was a record voting response.

Committee Reports

Publication Committee:
Four goals have been established for the next year.

1. Newsletter to be published 3 times, on schedule with 450 copies to be sent. The updated mailing list that Steve Jones compiled, with dues collection has helped keep returns for faculty addresses to a new low level. Submission due dates for the newsletter will be 15 days prior to publication. Publication dates have been established as July 1, October 1 and February 1.
2. Maintain the list/serve is a priority. Members can now add information without going through Jack Elliot’s office by going directly to the web site at www.aiaee.org.
3. Maintaining the home page for the Association.
4. Reviewing and updating the Associations Membership Application.

Constitution and Bylaws:
A report was presented by Barb Ludwig. The main issue is the Association logo design and the need to review the design.

Scholarly Activities:
A report was resent by Jim Christiansen that indicated that 68 of the 107 proposal for professional papers were accepted for presentation. In addition, six alternate papers were selected and will be included in the proceedings. Sixteen poster session proposals were accepted and eleven presentations of refereed carousel round tables abstracts were accepted.
The complete proceedings were compiled and 187 CD-ROMS have been brought to the Conference. Additional CD-ROMS will be sent to South Africa as needed.

Dr. Gary Wingenbach and Dr. Jimmy Lindner were thanked for their work in preparing the Web-based and CD Proceedings.

The Leadership Team complemented the Scholarly Activities Committee and Chairperson, James Christiansen for their excellent work.

Gary Wingenbach reported that the Editorial Board will hold a meeting at 18:00 to 19:00 hours on Monday evening. The board thanked Jim Connors for his work in 2001 as edition of the journal. Wingenbach also requested that copies of the Journal be sent to university libraries encouraging them to subscribe to the Journal.

The Journal has been sent to the ISI database for review for being included in the database of “approved” preferred journals maintained by the Institute for Scientific Information. Procedures for subscriptions and payment to ISI were discussed.

Membership:
A report was presented by Jim Diamond that 219 members from 33 countries are current members of AIAEE. This is a 16% membership increase over the previous year. In addition there are 28 life members for a total membership of 247 paid members. It was announced that lapel pins will be available for sale at the conference. New member orientation will be conducted on Sunday evening.

Awards and Recognition:
Wade Miller reported on the activities of the awards and recognition committee. He reported that nominations for awards were very good this year.

Conference Planning:
Gustav Düvel reported on the work with the hotel, tours, program and field visits for the Conference Approaches and Partnerships for Sustainable Extension & Rural Development. Ben Sevens reported on the post-conference tours that are planned for two different locations.

The 2003, 2004 and 2005 Conference sites were discussed with the possibility of the 2005 Conference venue being San Antonio, Texas.

It was decided that the post conference planning meeting would be shorten to only critical items to allow people to attend the post conference tours and the summer meeting board meeting would conduct the remaining business.

It was decided that the summer Leadership Team Planning meeting would be held Thursday and Friday, July 11-12 at the Sheraton Hotel, Raleigh, North Carolina.

Respectfully submitted,

Frank L. Brewer
AIAEE Secretary
President John Richardson called the meeting of the 18th Annual Conference of the AIAEE to order on Thursday, May 30, 2002.

The minutes of the 17th Annual Conference were presented by Secretary Frank Brewer. Motion to accept the minutes passed.

The treasurer’s report was presented by Treasurer Steve Jones. As of May 21, 2002 the following are the balances.

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Treasurer’s report was accepted as reported.

Leadership Team election results were reported by President Richardson as follows:
- President-elect – Steve Jones
- Secretary – Frank Brewer (1 year)
- Treasurer – Nick Place (1 year)
- Board Member at Large – Michelle Owens (3 years)
- Student Representative – Jean-Claude Bizimana (1 year)

Gustav Düvel will serve as President and John Richardson will continue to serve on the Leadership Team as past president.

The student representative report was presented by Kristin Davis who reported that $300 had been raised for student scholarships from the raffle held at the Conference.

Committee Reports
Jim Christiansen reported on the work of the Scholarly Activities Committee. He reported that 68 of the 107 proposals for professional papers were accepted for presentation. In addition, six alternate papers were selected and are included in the proceedings. Sixteen poster session proposals were accepted and eleven presentations of refereed carousel round table abstracts were accepted for presentations. Christiansen thanked Matt Baker, Gary Wingenbach and Jimmy Lindner for their leadership in developing the Scholarly Activities portion of this years Conference.

The complete proceeding on the Conference have been complied and printed on CD-ROMS and placed on the Web at www.aged.tamu.edu/aiaee. It was also announced that papers that appears in the Proceedings can now be increased in number of pages as the Proceedings are put online.

It was also reported that 17 session chairs, 17 facilitators and 18 discussants were selected from the 44 participants that volunteered to carry out these professional responsibilities at the Conference.
It was announced that the Journal is being reviewed by ISI (Institute for Scientific Information) to be included in their data base system.

Gary Wingenbach, editor, reported that submissions to the Journal have increased from about 30 in the past years to 40 now. 68 members from 16 countries have registered as potential reviewers of publication submissions.

Issues of the Journal are now online on the AIAEE web site through the Volume 7, Number 2.

President Richardson announced that Jim Christiansen will serve as chair of the Scholarly Activities Committee for one additional year.

Jack Elliott reported on the Publications Committee. He indicated that three (3) issues of the newsletter are scheduled to be published on July 1, October 1, and February 1. Submission due dates are 15 days prior to publication dates.

It was also announced that a graduate student page will be added to the Association web site at www.aiaee.org. Members are also reminded that they must go to the web site to register themselves for the list serve.

The Constitution and Bylaws Committee report was presented by Barbara Ludwig.

The membership committee report was presented by Jim Diamond. The committee thanked Jerry Gibson for this help in updating the membership lists. It was reported that we have 250 members including 28 life members.

The Awards and Recognition Committee report was presented by Wade Miller. The committee thanked Michael Woods for his help with the Awards Dinner Publication featuring the winners.

The Conference Professional Papers winners were announced as follows:

1st Place
Hassan Sadighi and Gabraeel Mohammadzadeh, Extension Professional Staffs’ Attitudes Toward Participatory Approach of Extension Activities and Rural Development

1st Runner Up – Graduate Student
M. J. Maswikaneng, W. van Averbeke, R. Böhringer and E. Albertse, Urban Farmers as an Extension Domain. The Case of Atteridgeville (Pretoria, South Africa)

2nd Runner Up
Mark Erbaugh, Joseph Donnermeyer, and Samuel Kyamanyala, Factors Associated with the Use of Pesticides in Uganda: Options for Targeting Integrated Pest Management Programs

3rd Runner Up
Brent Simpson and Michelle Owens, Farmer Field Schools and the Future of Agricultural Extension in Africa

Grad Student Paper
Tsakani Ngomane and Constance Flanagan, Hope and despair: Extension Agents in a Young Democracy

The Conference Planning Committee report was presented by Gustav Düvel.
The Resolutions Committee report was presented by Michelle Owens. Resolutions were developed for Ramona Herring, James Christiansen, John Richardson and Gustav Düvel, Denise Davies and the South African Society for Agricultural Extension.

All Committee reports were approved by the membership
No unfinished business was presented.

New Business
The 2003 Conference details were presented by John Richardson. The Conference will be held at the Sheraton Hotel in Raleigh North, Carolina from the 8-12th of April 2003. Room costs will be about $89 per room.

The 2004 Conference in Dublin, Ireland was discussed. Dermot Ruane, University College Dublin, presented a report on the Conference venue in Dublin Ireland. It was announced that the Conference will be held at the Stillorgan Park Hotel.

The 2005 Conference site selection was discussed. The membership voted to hold the Conference in San Antonio, Texas following a presentation by James Christiansen.

It was announced that the Summer Board Meeting will be held July 11-12, 2002 at the Sheraton Hotel in Raleigh, North Carolina.

Conference adjourned.

Respectfully submitted

Frank L. Brewer
AIAEE Secretary
Post-Conference Leadership Team Meeting Minutes  
Summer Board Meeting  
July 11-12, 2002

Attendance: Gustav Düvel, Steve Jones, Frank Brewer, John Richardson, James Christensen

The meeting was called to order by President Düvel. The leadership team met with Sheraton Capital Center representative, Melody Cobb, Director of Sales. She indicated that Marsha Parish, Convention Service Manager, would be working directly with our group for the 2003 conference. She also indicated that we had all of the meeting room space in the hotel and no other group would be there at that time. She conducted a tour of potential meeting rooms and hotel facilities to be used. Excellent space is available for us to use, including five breakout rooms.

President Düvel reviewed the 2002 Conference evaluations from Durban. The evaluations results were excellent. 331 people participated in the conference in Durban.

The financial report for the Conference indicated that the conference income covered all expenses. Steve Jones moved that the balance of the total conference operational income, inclusive of both groups and including sponsorships, over expenses from the 2002 Durban Conference in the amount of 114,845 Rand, be divided equally between SASAE and AIAEE. This will be approximately $5,700 U.S., each based on the current currency conversion, subjected to actual rate at the time of conversion. Motion seconded by Brewer. Motion passed.

Recommendations for future conferences were discussed.

Plans and the program for the 2003 Conference in Raleigh to be held at the Sheraton Hotel, April 8-12, 2003 were developed.

It was recommended that we target 68 scholarly papers presentation. Increasing participation by members in developing countries was discussed. John Richardson moved that members of Regional Chapters of Associations for International Agricultural Extension Education be provided a $50 Registration Scholarship at Annual Conferences. Motion Passed.
The 2003 proposed program is as follows:

**Going Forward in Agriculture and Extension Education**
*Trends, Policies and designs Worldwide*

**Tuesday April 8, 2003**

8:00  Registration/Poster set up

9:00-1:00  Board Meeting of Leadership Committee

2:00-3:00  New Members Session

2:00-3:00  Spouses/Guests Session

3:00-5:00  General Session – Welcome
  - AIAEE, Gustav Düvel
  - North Carolina Director of Extension, John Orr
  - Secretary of State – KEYNOTE Speaker Elaine Marshall
  - International Dimensions, Dr. George Wilson

6:00-8:00  Reception

**Wednesday, April 9, 2003**

8:00-10:00  Scheduling Paper Presentation

10:00-10:30  Break

10:30-Noon  Committee Meetings

Noon-1:30  Lunch

1:30-3:30  Scholarly paper presentations

3:30-4:00  Break

4:00-5:30  Carousal presentations (3 sessions, 20 minutes each)

Dinner on your own

5:30-7:00  Journal Editing and Managing Meeting

7:00-9:00  Graduate Student Meeting (with Pizza & Pop)
Thursday, April 10

Field Trips. Dr. John O’Sullivan suggested a theme for field trips:
Agriculture and Rural North Carolina Entering 21st Century In A Changing Economy

Tour Options:
1. Conventional Agriculture – Johnson County area including tobacco growing
2. Neuse River Water Shed – Water shed management educational program, improving water shed agriculture, water quality, agriculture education, horticulture industry
3. Cultural Tour of North Carolina
4. New Agriculture – New farmer program, alternate agriculture, Chatham County Farmers Market, organic farming

Evening North Carolina BBQ and music at Wake County Extension Center/North Carolina 4-H fairgrounds for 200 people

Friday, April 11

8:00-10:00 Scholarly paper presentations
10:30 Break
10:30-12:00 Going Forward Projects
12:00-1:00 Lunch (furnished)
1:00-2:30 Business Meeting
2:30-3:00 Break
3:00-5:00 Concurrent sessions (to be determined)

Evening On your own

Saturday, April 12

Breakfast
8:30-10:30 Scholarly papers
10:30-11:00 Break
11:00-1:00 Awards Lunch and Ireland 2004
1:00-3:00 Post Conference Leadership Meeting

Spouses’ tour to be established for Wednesday, Thursday, and Friday; possibilities include:
• Museums
• Botanical Gardens, Duke Gardens
• Museum Life Sciences
• Raleigh Communication Center
• Governors Mansion
• Pottery tour to Sandhills
Frank and Anita Brewer to work with spouses/guests tours in cooperation with Bernadette. The regular conference tours will be utilized for THURSDAY. Posters will be displayed Tuesday and Wednesday and a person will be at the posters 5-7PM on Tuesday.

John Richardson moved that the AIAEE organization provide the Journal editor $1,500 seed money for establishing an operating account to be reconciled annually, with operating funds balance above $1,500 forward to the Association treasury. Seconded by Steve Jones. Motion Passed.

John Richards moved and Frank Brewer seconded that the Journal Senior editor receive an honorarium of $250 per issue effective July 1, 2002. The funds are to be issued by the Association treasurer from general funds after the printing of each issue. Motion passed.

The Association fiscal year is July 1 to June 30.

Scholarly Activities Committees report discussed scholarly papers submission requirements. It was determined that up to 12 pages be allowed for accepted papers.

The format for the conference program, the paper version of the summary report of proceedings, and the proceedings in CD ROM form and on-line will be the same for the 2003 AIAEE conference as it was for the 2002 conference.

**Budget Approvals:**

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<td>Scholarly Committee</td>
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<td>Membership</td>
<td>$100</td>
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<tr>
<td>Awards</td>
<td>Continuing budget</td>
</tr>
</tbody>
</table>

Brewer moved that the chairpersons, of major association committees, term be limited to a maximum of four years of continuous service. Members may be reappointed to the same committee as chairperson after a one-year break in service. Seconded by Steve Jones; Motion Passed.

Leadership Team discussed candidates for officers in 2003. John Richardson will develop a ballot of candidates for the positions of president elect and secretary.

The Conferences in Dublin, Ireland in 2004 and Texas in 2005 were reviewed.

Meeting adjourned.

Respectfully submitted,

Frank L. Brewer  
AIAEE Secretary
2002 AIAEE Award Winners

Outstanding Service Award

Dr. Stephen Jones, Associate Professor
University of Minnesota
240 Vo Tech Building, 1954 Buford Ave
St. Paul MN 55108-6078

Outstanding Leadership Award

Dr. Satish Verma, Professor
Louisiana State University
Specialist, Institutional Research and Organization Development
H.C. Sanders Professor of Extension and International Education
LSU Agricultural Center
P.O. Box 25100
Baton Rouge, LA 70894-5100

Outstanding Young Professional

Dr. Randall Andreasen, Assistant Professor
Southwest Missouri State University
901 S. National Ave
Springfield, MO 65804
ASSOCIATION FOR INTERNATIONAL
AGRICULTURAL AND EXTENSION EDUCATION

ANNOUNCES A CALL FOR PROFESSIONAL PAPERS
to be presented at the

19th Annual Conference of AIAEE
Sheraton Capital Center Hotel, Raleigh, North Carolina, USA
April 8 through April 12, 2003

AIAEE will accept summaries of proposals for professional papers to be presented at the 19th annual conference that relate to issues in international agricultural and extension education. Topics related to the 2003 conference theme of “Going Forward in Agricultural and Extension Education: Trends, Policies, and Designs Worldwide” are encouraged, but all submissions will be given full consideration. Research, theoretical/philosophical theme-based or application-oriented papers will be considered. In order to submit a proposal, at least one author must be an AIAEE member. Contact Dr. Nick Place, AIAEE Treasurer, Department of Agricultural Education and Communication, 219 Rolfs Hall, University of Florida, Gainesville, FL 32611-0540 USA, for membership information (e-mail: nplace@mail.ifas.ufl.edu; phone: 352-392-0502, ext. 227; fax: 352-392-9585; or download membership information from the web site at http://www.aiaee.org/).

New members are invited. For additional information on AIAEE, please view our web site at: http://www.aiaee.org. Please tell your professional colleagues, whether at home or in other countries, about the opportunity to submit a proposal. Each proposal is limited to no more than four pages (title page and three pages of text) and requires the following information:

1. Separate title page with names and addresses of author(s) (full contact information, including position and/or title, mailing address, fax number, telephone number, and e-mail address of the author responsible for receiving communications from AIAEE). E-mail address is especially important. As a footnote on the title page, please indicate if you are willing to have your proposal considered for a poster session, should it not be possible to accept it for one of the paper sessions.

2. The summary should not exceed three double-spaced pages of text (1-inch margins, 12-point, and Times New Roman font).

3. Please follow the prescribed format when submitting proposals: (a) Introduction, (b) Purpose of the paper, (c) Methods and/or data sources; OR theoretical/philosophical themes (the problem or issues, with attention to the reasoning used), (d) Results, products, and/or conclusions, and (e) Educational importance, implications, and application.

4. Please submit your proposal electronically as a Rich Text File (.rtf extension) attached to an e-mail message. Please use Microsoft Word 1997 or a later version when preparing the proposal.

5. In the event an author does not have access to a computer with e-mail capability so as to be able to submit electronically, please send four paper copies of the proposal to the address below.

6. More than one proposal may be submitted.

The deadline for submitting proposals for papers is October 1, 2002. Please send proposals to Dr. James E. Christiansen, Department of Agricultural Education, Texas A&M University, College Station, TX 77843-2116 USA. E-mail is j-christiansen@tamu.edu. Each proposal will be peer reviewed by three respected agricultural and extension educators. Authors of paper proposals will be notified in November 2002 and paper specifications will be given to those accepted for presentation. The paper limit has been increased to 12 pages. Presenters will be required to register for and pay the conference registration fee.

WE ALSO ISSUE A CALL FOR SUBMISSIONS TO A POSTER SESSION AND TO A REFEREED CAROUSEL ROUNDTABLE DISCUSSION.
ASSOCIATION FOR INTERNATIONAL AGRICULTURAL AND EXTENSION EDUCATION

Announces a CALL FOR POSTERS for
The 19th Annual Conference of AIAEE in
Raleigh, North Carolina, USA
April 8-12, 2003

Going Forward in Agricultural and Extension Education:
Trends, Policies, and Designs Worldwide

AIAEE is accepting proposals for refereed abstracts (to be presented as posters) relating to issues in international agricultural and extension education. Topics relating to the 2003 conference theme are encouraged, but all submissions will be given full consideration.

Purpose
To present visually a concept or idea that reflects innovative models of research, educational programming, or evaluation.

Poster guidelines
Posters should be printed on one continuous sheet of paper
Posters will be displayed on a flat wall service
Maximum size 4’ x 6’ (120 cm x 180 cm)
Posters will be on display one entire day of the conference; presenters are expected to be present during the evening reception.
Must be an AIAEE member to submit a proposal—see below for membership information. New members and graduate students are encouraged to submit proposals.

Each poster proposal requires the following:
1. **Title page** with name(s) of authors including complete contact information (addresses, telephone number, fax number, and e-mail address).
2. A **one-page abstract** that includes introduction, purpose of poster, major points or information to be shared, conclusions, and educational importance.

Awards are presented to the top four poster presentations. Criteria for judging include: Technical content or information; originality or innovativeness; creativity of presentation or ideas; Conveys message (easily understood); importance of topic; and general appearance (well planned design, easily read, neat and well constructed)

**Deadline for submissions is October 1, 2002**
Submit electronic copy of the proposal to: James Lindner, Department of Agricultural Education, Texas A&M University, College Station, TX 77843-2116 USA. (Phone: 979-458-2701; Fax: 979-845-6296; E-mail: j-lindner@tamu.edu). Contact Dr. Lindner for more information.

For membership information, contact Nick Place, AIAEE Treasurer, 219-A Rolfs Hall, PO Box 110540, Gainesville, Florida 32611-054 (Phone: 352-392-0502; Fax: 352-392-9585; E-mail: nplace@mail.ifas.ufl.edu).
ASSOCIATION FOR INTERNATIONAL AGRICULTURAL AND EXTENSION EDUCATION

Announces a CALL FOR CAROUSEL ROUNDTABLE DISCUSSIONS for
The 19th Annual Conference of AIAEE in
Raleigh, North Carolina, USA
April 8-12, 2003

Going Forward in Agricultural and Extension Education:
Trends, Policies, and Designs Worldwide

AIAEE is accepting proposals for refereed abstracts (to be presented as carousel roundtable discussions) relating to issues in international agricultural and extension education. Topics relating to the 2003 conference theme are encouraged, but all submissions will be given full consideration.

Purpose
To present, using a written and oral format, abstracts of research, theoretical advances, or explanations of an issue for discussion.

Parameters
Carousel roundtables are small group presentations of abstracts. Each presentation is allotted 15 minutes; presenters will lead the carousel roundtable discussion three times to rotating groups. Copies of the one-page abstract should be available at the presentation. Presenters must be AIAEE members to submit a proposal—see below for membership information. New members and graduate students are encouraged to submit proposals.

Each carousel roundtable proposal requires the following:
1. A title page with name(s) of author(s) including complete contact information (addresses, telephone number, fax number, and e-mail address).
2. A one-page abstract that includes introduction, method, major points or information to be shared, conclusions or lessons learned, and educational importance.

Awards are presented to the top four carousel presentations: Criteria for judging include: effective communication of materials, logical rationale for major points, knowledgeable response to questions, skill in orchestrating discussion, contribution to knowledge base, management of time, and quality of abstract.

Deadline for submissions is October 1, 2002
Submit electronic copy of the proposal to: James Lindner, Department of Agricultural Education, Texas A&M University, College Station, TX 77843-2116 USA. (Phone: 979-458-2701; Fax: 979-845-6296; E-mail: j-lindner@tamu.edu). Contact Dr. Lindner for more information.

For membership information, contact Nick Place, AIAEE Treasurer, 219-A Rolfs Hall, PO Box 110540, Gainesville, Florida 32611-054 (Phone: 352-392-0502; Fax: 352-392-9585; E-mail: nplace@mail.ifas.ufl.edu).
Journal of International Agricultural and Extension Education

Subscription Form

The Journal of International Agricultural and Extension Education is a publication of the Association of International Agricultural and Extension Education. It is published three times per year in the spring, summer and fall. The summer issue is the Conference Issue which contains keynote addresses, panel discussions, meeting minutes, awards, and the outstanding papers presented at the annual AIAEE conference.

The Journal of International Agricultural and Extension Education is available in two formats. It is published in a booklet (hardcopy) version or it can be accessed through a protected Web site.

To order the current volume of the Journal of International Agricultural and Extension Education, please access the online Subscription Form at http://www.aged.tamu.edu/aiaee/jiaee/journalsub.asp, or complete the following information:

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Manuscript Submission Guidelines

General Requirements
All manuscripts should indicate the type of article—Feature; Commentary; Tools of the Profession—on the first page of the manuscript in the upper right-hand corner. **Do not send a diskette** with your manuscript submission. A diskette will be requested if the article is accepted following the Journal’s double-blind, peer-reviewed process. Diskette preparation guidelines will be supplied at that time. **Manuscripts should not have been published or be under current consideration for publication by another journal.**

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Manuscripts of Feature Articles are submitted to the editor. **Four double-spaced copies** of manuscripts without author’s name or affiliation are required. The article should include an abstract (a succinct gist of the article’s content) not exceeding 150 words. A separate title page with title, institution, complete address, telephone and fax numbers, and email address for each author is required. **There is no submission fee charged for submitting a feature article.** A $10.00/page (actual pages in the Journal) publication fee will be charged to the lead author upon acceptance to the Journal. Articles should be no longer than **12 double-spaced** 12-pitch (11 point) pages (including references, tables and figures) with one-inch margins on all sides.

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