The Journal of International Agricultural and Extension Education is the official refereed publication of the Association for International Agricultural and Extension Education. The purpose 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.

**Feature Articles**

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. Feature articles go through the Journal's blind review process utilizing peer reviewers to evaluate content and readability. Reviewers are usually selected from the membership of the AIAEE. In the blind 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.

**Tools of the Profession Articles**

Tools of the Profession articles report on specific techniques, materials, books and technologies that can be useful to 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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Journal of International Agricultural and Extension Education

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THE ASSOCIATION COMES OF AGE

Jack Elliot, Assistant Professor
Department of Agricultural Education
The University of Arizona

Abstract
Jack Elliot, an AIAEE member for 10 years and editor of the Journal since 1992, reflects on the growth of the Association and the emergence of the Journal.

The Beginning
My first AIAEE meeting was the 3rd annual conference in the spring of 1987. Presenters were asked to bring 100 copies of their research papers so that the proceedings could be assembled by graduate students at the conference. It seemed that someone mentioned that a journal was something to think about for the future.

A year later a group (perhaps a committee) reported that publishing a journal was unrealistic because of cost and a lack of interest among members. The idea of a journal never died, but it was not an agenda item until the early 90s.

The White Paper
A group of three AIAEE members, Jack Elliot from Michigan State University at the time, Bill Seiders from University of Illinois and Satish Verma from Louisiana State University, prepared a journal white paper that was presented at the 1991 conference in St. Louis, MO. The membership accepted the white paper that outlined the steps required for the first journal. A process was established to select the first editor and Jack Elliot was chosen. Anne Fox from Oregon State University joined the team and the four members, along with the Association Treasurer Wade Miller of Iowa State University, became the first editorial board.

Volume 1
A variety of items delayed the publication of the first volume until the tenth anniversary of the association. Getting registered with the Library of Congress and obtaining an ISSN number proved to be educational events.

The editorial board employed a variety of unique features to the journal. They produced a full size journal that recognized the outstanding research presentations from the annual meeting by accepting the papers for the journal. In addition, the outstanding graduate student research paper was also published. The journal was offered in booklet, disk and E-mail formats.

Bill Seiders left the University of Illinois and was replaced on the editorial board by Don Meaders of Michigan State University. Jan Henderson of The Ohio State University became the new Association treasurer and, therefore, the newest member of the editorial board.

Transition
Satish Verma was selected as the 1996-1998 Journal editor. Now that the Journal is established expanding its circulation is a future consideration. Regional Associate Editors are proposed for each continent. Making the Journal available on the Internet is planned. The membership will be encouraged to submit theme articles, book reviews and other non-traditional articles in future volumes.

The future looks bright for AIAEE and the Journal. The new editorial board and direction are logical next steps as the Association comes of age. @
ADULT AGRICULTURAL EDUCATION NEEDS ASSESSMENT FOR THE
DMITROV DISTRICT - RUSSIAN FEDERATION

James J. Connors, Assistant Professor
Department of Agricultural and Extension Education
The University of Idaho

Outstanding Research Presentation
This paper is one of five outstanding research papers from the Eleventh Annual Meeting of the
Association for International Agricultural and Extension Education, Little Rock, Arkansas, U.S.A.,

Abstract
This needs assessment was conducted during the summer of 1994 during the researcher’s Farmer-
to-Farmer assignment in the Dmitrov District - Moscow Oblast - Russian Federation. A survey
instrument translated into Russian was administered in face-to-face interviews with private farmers
and agricultural workers. Respondents were interested in adult agricultural education seminars
covering agricultural mechanics, animal feeds and nutrition, animal health and many other topics.
Recommendations were made to the National Educational Methodology Center for conducting
adult agricultural education seminars with citizens in the Dmitrov District.

Introduction
Russian agriculture is currently going through drastic changes. The recent breakup of the
former Soviet Union has left State and Collective Farms in a state of limbo. Many people who
used to work for the state and collective farms are seeking to start their own private farms.
However, other people without any prior agricultural experiences are also interested in
entering farming. As a result, most of these "private farmers" need education about new and
innovative agricultural practices.

The National Educational Methodology Center (EMC) in Novosinkovo Settlement, Dmitrov
District is the organization that is delegated by the Ministry of Agriculture to provide
educational curriculum in agriculture. Another part of its duties is to offer non-formal adult
education programs for people in the Dmitrov District. In order to better determine the types of
adult education needed for private farmers and others interested in agriculture a needs
assessment was necessary.

Theoretical Base
The need for adult education in agriculture is world-wide. Curle (in Finley and Price, 1994)
advocates that An developing societies . . . significant attention should be given to the
enhancement of education in agriculture" (p. 279). Curle goes on to state that adult education
in agriculture should "give the cultivators themselves as much education in agriculture as
possible, both through extension work and, where feasible, through short courses of
instruction" (p. 279).

Every adult education program in agriculture should have an expressed philosophy. Diamond
(1987) identified three functions that need to be addressed in planning international adult
education programs in agriculture. Diamond stated "the third function is to introduce modern
agricultural concepts by using the indigenous talents, skills, and natural resources already in
place. Such concepts should address the felt needs as expressed by a nation's populace" (p. 23).
Prawl, Medlin and Gross (1984) stated "Up to two-thirds of the people in most developing countries live and work in the rural areas. Most of them depend on agriculture for their livelihood as either laborers, tenants, landowners or employees or owners of agriculture-related industries" (p. 150). As the Russian Federation increases the distribution of land formerly farmed by State or Collective Farms to the new breed of private farmers there exists a growing need for education in new technological advances in agricultural production. Borg and Gall (1983) defined need as "a discrepancy between an existing condition and a desired set of conditions" (p. 753). They went on to say "Educational needs can be assessed systematically using research methodology. This type of evaluation research is important because assessment of needs provides the foundation for developing new programs and for making changes in existing programs" (p. 753).

In a similar study by Long and Luery (1994) conducted with private farmers in Uzbekistan it was recommended that teams of farmers be chosen to participate in short courses in agriculture. The researchers suggested that on-farm demonstrations and experiments be used as a means for instruction. The study also found that teams of faculty members representing the state university, Winrock International and specialists from the United States be used to teach short courses in agriculture to the Uzbek farmers.

As a part of developing this theoretical framework for this needs assessment a conceptual framework was developed. This conceptual framework identifies the factors that affected the needs assessment. Figure 1 shows the conceptual framework for this study.

**Purpose and Objectives**

The purpose of this needs assessment was to determine the types of adult agricultural education seminars needed by the residents of the Dmitrov District - Russian Federation. Specific objectives included:

1. Determine the educational background of residents of the Dmitrov District.
2. Determine the agricultural topics that are of interest to the residents.
3. Determine the residents' ideas for seminar length, location and instructors.
4. Provide the Educational Methodology Center with recommendations on seminar planning for 1995.

**Methodology**

The methodology used for this study was a survey instrument administered during personal interviews with the respondents. Due to the limited public mail service and the poor quality telephone system in rural Russia, face-to-face interviews were selected as the means for administering the needs assessment instrument.

A rough draft of a needs assessment survey was developed after consulting with agricultural education professionals at both the National Education Methodology Center and the adjacent Yakhromsky Agricultural Technicum (college). The rough draft was checked for content validity by officials of the National Educational Methodology Center. As a result of their recommendations, several questions were reworded and three questions were added.

The final survey was translated from English to Russian and contained 18 questions. The survey was administered to farmers, agricultural workers and other interested parties during visits to farms in the Dmitrov District during July 1994. No attempt to generalize the results beyond the individuals who responded was made.
Results

A total of 24 completed surveys were completed by individuals in the Dmitrov District. The largest percentage of respondents, 54.2% were private farmers. Figure 2 shows the place of employment of respondents. Objective 1 was to determine the educational background of respondents. The mean number of years of general education was nine. Most respondents had very little formal education in agriculture. The mean number of years of formal agricultural education of respondents was three. Respondents were also asked how many years they had been employed in agriculture. The mean number of years of agricultural employment was 13.25. The length of employment ranged from 1 month to 43 years. The largest percentage, 66.6%, was male. Table 1 shows the age of respondents.
Table 1

Age of Respondents

<table>
<thead>
<tr>
<th>Number</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>36.7</td>
<td>16</td>
<td>59</td>
</tr>
</tbody>
</table>

Objective 2 of the needs assessment was to determine the agricultural topics of interest to residents of the Dmitrov District. A list of 12 common agricultural topics was developed and included on the survey. Respondents were asked if they were interested in each topic. Respondents circled "yes" or "no" for each topic.

Table 2 shows the number and percentage of respondents who responded "yes" to each topic area. The topics are listed in descending order of interest. The topics receiving the most "yes" responses were agricultural mechanics and animal health/veterinary care.
Table 2

Agricultural Topics of Interest to Respondents

<table>
<thead>
<tr>
<th>Agricultural topic</th>
<th>Number Responding &quot;yes&quot;</th>
<th>Percentage responding &quot;yes&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural mechanics</td>
<td>12</td>
<td>50.0</td>
</tr>
<tr>
<td>Animal feeds and nutrition</td>
<td>12</td>
<td>50.0</td>
</tr>
<tr>
<td>Animal health/veterinary care</td>
<td>11</td>
<td>46.0</td>
</tr>
<tr>
<td>Dairy production (including goats)</td>
<td>11</td>
<td>46.0</td>
</tr>
<tr>
<td>Crop production</td>
<td>10</td>
<td>41.6</td>
</tr>
<tr>
<td>Beef production</td>
<td>9</td>
<td>37.5</td>
</tr>
<tr>
<td>Glass house plant production</td>
<td>8</td>
<td>33.3</td>
</tr>
<tr>
<td>Gardening</td>
<td>7</td>
<td>29.2</td>
</tr>
<tr>
<td>Agricultural business management</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td>Swine production</td>
<td>6</td>
<td>25.0</td>
</tr>
<tr>
<td>Equine production</td>
<td>3</td>
<td>12.5</td>
</tr>
<tr>
<td>Sheep production</td>
<td>3</td>
<td>12.5</td>
</tr>
</tbody>
</table>

Objective 3 was to determine respondents’ ideas for seminar length, location and instructors. Respondents were asked the best season to hold the seminars, the best time of day, the best day of the week, the length of the seminar in hours/day and total weeks.

An overwhelming majority of respondents indicated that winter was the best season of the year to hold the seminars. The best time of day was afternoon or evening. Respondents indicated that any day of the week was fine. The ideal number of hours per day was three or four. Respondents indicated the seminars should last for about four weeks. Respondents were asked to indicate the best location to hold the seminars. The National Educational Methodology Center, Yakhromsky College and Yakhromsky Farms, as well as, any other location were possible seminar sites. The largest percentage of respondents, 34.8%, indicated Yakhromsky College or other places, such as local settlements, were the best locations for the seminars. Table 3 shows the data for location of the adult agricultural education seminars.
Table 3

Suggested Locations for Adult Agricultural Education Seminars

<table>
<thead>
<tr>
<th>Location</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yakhromsky College</td>
<td>8</td>
<td>34.8</td>
</tr>
<tr>
<td>Other locations</td>
<td>8</td>
<td>34.8</td>
</tr>
<tr>
<td>National Educational Methodology Center</td>
<td>4</td>
<td>17.4</td>
</tr>
<tr>
<td>Yakhromsky Farms</td>
<td>3</td>
<td>13.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>23</td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Residents of the Dmitrov District indicated which methods of instruction they preferred. Methods listed included lecture, laboratory exercises, video tape presentations, and slide presentations. The method receiving the most positive responses was laboratory exercises.

Table 4 shows the number and percentage of respondents who responded "yes" to each topic area. The methods are listed in descending order of interest.

Table 4

Instructional Methods Preferred by Respondents

<table>
<thead>
<tr>
<th>Instructional method</th>
<th>Number responding &quot;yes&quot;</th>
<th>Percentage responding &quot;yes&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory exercises (hands-on activities)</td>
<td>19</td>
<td>82.6</td>
</tr>
<tr>
<td>Video-tape</td>
<td>15</td>
<td>65.2</td>
</tr>
<tr>
<td>Lecture</td>
<td>14</td>
<td>60.9</td>
</tr>
<tr>
<td>Slide presentations</td>
<td>9</td>
<td>39.1</td>
</tr>
<tr>
<td>Photographs</td>
<td>9</td>
<td>39.1</td>
</tr>
</tbody>
</table>

The respondents were asked who they would like to see teach the seminars. Possible teachers included: visiting professionals such as farmers, teachers, or experts from other countries, teachers from Yakhromsky College, specialists from EMC, and visiting professionals from other Russian agricultural technicums. The group receiving the most positive responses was
visiting professionals such as farmers, teachers or other agricultural experts from other countries. Table 5 shows the number and percentage of respondents who responded "yes" to each group. The preferred teachers are listed in descending order of interest.

Table 5

Instructors Preferred by Respondents

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Number responding &quot;yes&quot;</th>
<th>Percentage responding &quot;yes&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visiting professional from other countries</td>
<td>17</td>
<td>73.9</td>
</tr>
<tr>
<td>Visiting professionals from other agricultural technicums in Russia</td>
<td>13</td>
<td>56.5</td>
</tr>
<tr>
<td>Specialists from the National Educational Methodology Center</td>
<td>7</td>
<td>30.4</td>
</tr>
<tr>
<td>Teachers from Yakhromsky Technicum</td>
<td>4</td>
<td>17.4</td>
</tr>
</tbody>
</table>

Conclusions

Based on the findings, the following conclusions were developed:

1. Individuals contacted in the Dmitrov District of the Moscow Oblast have a genuine need for non-formal, adult agricultural education seminars. Topics identified as the most important include agricultural mechanics, animal feeds and nutrition, animal health/veterinary care, and dairy production.

2. The majority of the individuals completing the needs assessment indicated the agricultural education seminars should be held at the Yakhromsky Agriculture College or at on-farm locations in local settlements.

3. Laboratory exercises, video-tapes and lecture were the methods of instruction preferred by respondents, respectively.

4. Visiting professionals from other countries or agricultural technicums in Russia were indicated as the most desirable instructors for the seminars.

5. A series of adult agricultural education seminars was planned and recommended to the National Educational Methodology Center. Steps are being taken to implement these recommended seminars and identify participants, facilities, instructional methods and instructors.
Educational Importance

As more and more private individuals start farming in the Russian Federation there will be a growing need for adult educational programs in agriculture. Instruction in basic topics such as agricultural mechanics, animal feeds and nutrition, and animal health and veterinary care is needed. The need for adult agricultural education will have a direct impact on land-grant universities in the United States. Technical specialists and educational professionals will be needed to develop and teach non-formal educational programs for adult farmers in countries such as Russia. The next decade will be significantly important as private farmers in the Russian Federation and other countries develop their agricultural expertise and join the rest of the world in the global marketplace.

Bibliography


THIRD WORLD AGRICULTURAL EXTENSION ORGANIZATIONS=OBLIGATIONS TOWARD THE EDUCATIONAL NEEDS OF RURAL PEOPLE: A NATIONAL SURVEY

Ismail E. Mohamed, World Bank Scholar
Julia A. Gamon, Associate Professor
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Department of Agricultural Education and Studies
Iowa State University

Abstract

This study documented perceptions of extension educators and international graduate students of extension education in the United States toward what agricultural extension organizations in the Third World should fulfill from among the educational needs of rural people. Data were solicited from 96 extension educators and 128 international graduate students of extension education at 33 universities using a mailed questionnaire. Reliability, frequencies, t-tests, Spearman correlation coefficients, factor analysis, and analysis of variance were employed to analyze the data. Results indicated that both extension educators and international graduate students of extension education in the United States agreed that the agricultural extension organizations in the Third World should commit their resources to satisfy the educational needs of rural people regarding: (1) application of new inputs, varieties, and improved farm practices, (2) application of new and improved practices related to livestock production, (3) food storage, processing, and preservation, (4) knowledge and skills for family improvement, (5) civic skills, (6) supplementary skills for farm maintenance, and (7) farm business management.

Introduction

Extension work is education for change. It consists of fostering change in what people know (knowledge), change in what people understand (attitudes), and change in what people can do (skills) (Raman, 1992). Although rural people engaged in farming already have considerable knowledge about their environment and farming systems, extension educators provide them other knowledge and information, which they do not have, and facilitate their education for development (Blankenburg, 1984; Oakley & Garforth, 1985).

Oakley and Garforth (1985) viewed extension as a collective term that brings together all agricultural and nonagricultural activities including working with rural people, supporting them, and preparing them to confront their problems. Ekpere (1984) identified the following among the learning needs of rural people directly engaged in agriculture:

1. Farm planning and management, rational decision-making, record keeping, and the use of credit.
2. Application of new inputs, varieties, and improved farm practices.
3. Storage, processing, and preserving food.
4. Skills for farm maintenance.
5. Knowledge of government policies, programs, and services.
Critics of orthodox extension, like Paulo Freire, stressed that the technology transfer approach of extension embodied a "banking" concept of knowledge. People must become the subjects of their own history, rather than the objects of external analysis. Freire's 1970's "dialogical extension" is thus more akin to empowerment than to conventional technology transfer. As a form of adult education, extension has contended with widespread adult illiteracy (Bhola, 1989). But what has been technologically possible has not been ideologically acceptable (Freire, 1973). In by-passing literacy, not only are messages changed, but also dependent communication and therefore, dependent community relationships are perpetuated (Freire, 1970; 1972; 1973). The new ideology of adult education insists on adult education with adult literacy (Bhola, 1989). In this context, the agricultural extension organization is seen as a way of conceptualizing the content of its educational role, selecting what assists its users (farmers) in making nature and society transparent to themselves, and acquiring both "social" and "scientific" consciousness (Freire, 1973).

The idea of extension agencies with largely educational functions has come to receive great recognition and importance in most countries of the world. It has taken on even greater importance in the Third World because of the narrow base of education, the widespread illiteracy, recent famines experienced by many of these nations, and the importance of the agricultural sector for development (Mellor & Gavian, 1987). However, extension organizations in many Third World nations in their present form and capacity can provide only very limited help to most farmers in their basic enterprise (Mohamed, 1994). Today, there is an urgent need to investigate and identify what needs the agricultural extension organizations in the Third World ought to fulfill from among the many educational needs of rural people. This will not only help revitalize the organizations in the region, but also will free them of their extraneous responsibilities so that they can play their rightful role.

This study focused on extension education in Africa, Asia, and Latin America as perceived by extension educators and international graduate students of extension education in the United States. Specifically, the study described characteristics of the two groups and documented their perceptions toward what educational needs of rural people an extension organization ought to fulfill. In addition, the study focused on possible differences in perceptions and relationships between characteristics and perceptions.

Procedures

The framework of this study consisted of 33 universities in the United States that offered graduate programs in extension education in the fall of 1992. The 33 schools reported a total of 96 extension educators and 128 international graduate students of extension education in the fall of 1992.

Data collection

The survey instrument used to collect data was developed based on an extensive literature review. The scaled part of the survey instrument included eight items that were directly related to the educational needs of rural people. Subjects were asked to respond to each item by using a scale (1 to 5): 1=strongly disagree; 2=disagree; 3=undecided; 4=agree; and 5=strongly agree.

The instrument was tested for its validity and reliability at Iowa State University. A panel of five experts from Departments of Agricultural Education and Studies, Education, Journalism and Mass Communication (Technology and Social Change), and Statistics at Iowa State University validated the instrument. The instrument was pilot tested at Iowa State University with 12 randomly selected graduate students in the Department of Agricultural Education and Studies who were not part of the study. The analysis of the pilot test yielded a Cronbach's Alpha reliability of .77. The first mailing of the instrument resulted in 73...
completed questionnaires from extension educators (76%) and 68 from international graduate students (53.1%). The total response from both groups in the first mailing was 141 (62.9%). The follow-up mailing resulted in an additional ten completed surveys from extension educators and eight from international graduate students for a total response of 159 completed surveys (70.9%). There were no differences between nonrespondents and respondents.

**Data Analysis**

Cronbach's Alpha coefficient was used to examine the level of internal consistency and stability of the grouped items. Data were treated as interval. The mean score and standard deviation for each of the eight items were computed, and the t-test procedure was employed to compare the groups' mean scores on each item. Factor analysis and analysis of variance were used to detect possible relationships between perceptions and demographic characteristics.

**Results and Discussion**

Cronbach's Alpha Coefficient for the eight items in the scaled part was .76. Findings of the study indicated that the typical extension educator respondent was 48 years of age, a male, a full professor, and had about 25 years of work experience. The typical respondent had 16 years of extension work experience, taught extension courses for about 9 years, and had acquired some kind of international work experience. He was likely to be teaching in a school in the Southern Region of the United States.

The study also showed that the typical international graduate student of extension education studying in the United States was a 35-year-old male, African, doctoral student, with about 5 years of extension work experience. The typical student had received a bachelor's degree in a home country, a master's in the United States, and had spent three years studying in the United States. He was likely to be studying in a school in the North Central Region of the United States.

Table 1 shows the perceptions of extension educator and international graduate student respondents toward the educational needs of rural people. Mean scores ranged between 3.18 to 4.57 and 3.16 to 4.43 for extension educator and international graduate student respondents, respectively. The data indicated that both extension educators and international graduate students agreed that the agricultural extension organizations in Africa, Asia, and Latin America ought to fulfill rural people's educational needs regarding: (1) application of new inputs, varieties, and improved farm practices, (2) application of new and improved practices related to livestock, (3) food storage, processing, and preservation, (4) family improvement skills and knowledge (e.g., health care and nutrition), (5) civic skills (e.g. how cooperatives work), (6) farm maintenance skills, and (7) farm business management. The data in Table 1 also show that both groups were undecided about whether the organization ought to fulfill the basic educational needs of rural people (e.g., reading and writing). T-test results indicated that there were no significant differences between the perceptions of educators and graduate students toward what needs the agricultural extension organizations ought to fulfill from among the educational needs of rural people in the Third World.

To examine relationships between respondents' perceptions and their demographic characteristics, factor analysis was used to simplify the dependent variables (Table 2). The two factor indices identified were then included as a set of dependent variables in the analysis of variance. Results of the MANOVA indicated that no significant relationships existed between respondents' perceptions and their demographic characteristics collected in this study.
Table 1
Means, Standard Deviations and T-test for the Educational Needs of Rural People as Reported by Extension Educators and International Graduate Students

<table>
<thead>
<tr>
<th>Educational needs of rural people</th>
<th>Extension educators (n=83)</th>
<th>International students (n=76)</th>
<th>t-value</th>
<th>α-tail probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>General or basic education (e.g., reading, writing)</td>
<td>3.18</td>
<td>1.13</td>
<td>3.16</td>
<td>1.39</td>
</tr>
<tr>
<td>Application of new inputs: varieties, improved farm practices, etc.</td>
<td>4.45</td>
<td>0.63</td>
<td>4.43</td>
<td>0.78</td>
</tr>
<tr>
<td>Applications of new and improved practices related to livestock</td>
<td>4.42</td>
<td>0.65</td>
<td>4.35</td>
<td>0.84</td>
</tr>
<tr>
<td>Food storage, processing and preservation</td>
<td>4.53</td>
<td>0.55</td>
<td>4.42</td>
<td>0.72</td>
</tr>
<tr>
<td>Knowledge and skills for family improvement (e.g., health care, nutrition, home economics, child care, family planning)</td>
<td>4.57</td>
<td>0.55</td>
<td>4.35</td>
<td>0.91</td>
</tr>
<tr>
<td>Civic skills (e.g., knowledge of how cooperatives, local governments, and national governments function)</td>
<td>4.17</td>
<td>0.79</td>
<td>4.03</td>
<td>0.93</td>
</tr>
<tr>
<td>Supplementary skills for farm maintenance and improvement</td>
<td>4.27</td>
<td>0.59</td>
<td>4.35</td>
<td>0.67</td>
</tr>
<tr>
<td>Farm business management</td>
<td>4.46</td>
<td>0.55</td>
<td>4.43</td>
<td>0.66</td>
</tr>
</tbody>
</table>

\(^a\)Not significant at \(\alpha = 0.05\) and 0.001.

\(\text{HH}\) Separate variance estimate.

Table 2

Factors Identified by Factor Analysis of Right Items Related to the Educational Needs of the Rural People

<table>
<thead>
<tr>
<th>Variables</th>
<th>Item number</th>
<th>Factor loadings</th>
<th>Cronbach's alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor 1 (Knowledge to acquire scientific consciousness)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application of new and improved practices related to livestock</td>
<td>3</td>
<td>.88300</td>
<td></td>
</tr>
<tr>
<td>Application of new inputs, varieties and improved farm practices</td>
<td>2</td>
<td>.84774</td>
<td></td>
</tr>
<tr>
<td>Supplementary skills for farm maintenance and farm improvement</td>
<td>7</td>
<td>.72559</td>
<td></td>
</tr>
<tr>
<td>Farm business management</td>
<td>8</td>
<td>.72366</td>
<td></td>
</tr>
<tr>
<td>Food storage, processing and presentation</td>
<td>4</td>
<td>.64932</td>
<td></td>
</tr>
<tr>
<td><strong>Factor 2 (Knowledge to acquire social and political consciousness)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge and skills for family improvement</td>
<td>5</td>
<td>.75028</td>
<td></td>
</tr>
<tr>
<td>(health care, nutrition, etc.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General or basic education (reading, writing, etc.)</td>
<td>1</td>
<td>.72145</td>
<td></td>
</tr>
<tr>
<td>Civic skills (how cooperatives, national/local government function)</td>
<td>6</td>
<td>.67326</td>
<td></td>
</tr>
</tbody>
</table>

**Conclusions and Recommendations**

Extension educators and international graduate students of extension education in the United States agreed that the agricultural extension organizations in the Third World should take the responsibility of satisfying rural people's educational needs on knowledge that could help them acquire scientific consciousness, increase their productivity, and gain freedom in decision-making. However, both groups remained undecided about whether the organization should be involved in satisfying the basic educational needs of rural people such as reading and writing. Based on the findings of this study, it is recommended that the agricultural extension organizations in the Third World commit their resources and efforts to satisfy the needs of rural people for knowledge that would help them acquire scientific consciousness, improve their living, and gain freedom in decision-making. This could be achieved through teaching rural people how to cope with the many effects of the agricultural technology on the quality of life and enable them to put this technological change comprehensively within their cultural context.

**Educational Importance**

The results of the study indicated that there are seven areas of knowledge, which could help rural people acquire scientific consciousness. These seven areas were highly supported by both the extension educators and the international graduate students. Studies have shown that both extension educators and international graduate students of extension education in the United States were supportive to concepts that called for the agricultural extension organizations in the Third World to adopt an educational philosophy, mission, and focus on empowering the rural people (Mohamed, 1994; Mohamed et al., 1994). However, both groups in this present study were undecided about whether the agricultural extension organization should fulfill the basic educational needs of the rural people (such as reading and writing). Although there are some who persist in the view that adult and extension education can and even should be delivered without adult literacy, the same idea was strongly rejected by some other scholars (Freire, 1973; Bhola, 1989). The two authors suggested that adult literacy not be taught first and adult and extension education later, but that literacy must become conceptually and programmatically central to the adult and extension education. It is only through such integration that rural people will become truly
independent and be able to read the world around them.

In many of the Third World nations, where education is backward, it seems that there is no need to wait until rural masses can read before embarking on an effective agricultural extension program. However, while basic education (such as reading and writing) is not an absolute necessity, it does enable rural people to become independent and capable of educating themselves. It allows them to widen and deepen their knowledge and to share in great cultural movements which are mainly disseminated through written text.

References


EMPOWERMENT OF RURAL WOMEN
IN INDIA THROUGH LITERACY EDUCATION

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Abstract

This paper applies the methodology and theories of learning of Paulo Freire to the problems of agriculture extension and adult education (especially literacy) in Ujjain, Madhya Pradesh, India. This program is an on-going project. The purpose was to test the hypothesis that Freire's methodology as successfully demonstrated in Brazil, Latin America, Canada, and the United States, could be cross-culturally tested in India, and to assess whether the use of his method could result in improving economic status of so-called "illiterate" poor rural women. The research utilized both quantitative and qualitative data. Pre-test and post-test results and findings revealed that the dialogue method of problem solving and participatory research approach to literacy produces more active involvement of women in a democratic process to demand their rights and raise their voices for a political will to become self-sufficient.

Introduction

A major and fundamental problem for women in India is the high percentage (75%) of illiteracy (Directorate of Adult Education, 1981). A considerable literacy gap exists between men and women. As a result, women have been exploited and deprived of their rights.

In Indian society, gender bias is compounded by discrimination based on class, caste, and religion. Women have assumed a low status in society as a result of traditional beliefs. Gender bias promotes unequal allocation of resources, whether of food, credit, education, jobs, information, or training. Gender bias is a major cause of poverty because in its various forms it prevents women from receiving the education, training, health services, child care, and legal status to escape from poverty (Jacobson 1993, p. 62).

In rural areas both men and women engage in agriculture, but women are the major producers of food for household consumption. Women's labor produces 70-80% of the food crops grown on the Indian sub-continent (Jacobson 1993, pp.67-72, Gittenger 1990, Russo et al. 1989, and Chatterjee 1991). Farm women look after not only their household chores, but also a number of farm activities. Intensity of participation varies according to the nature of work, certain activities involve joint work, such as transplanting, weeding operations, and marketing of livestock. In these activities, the farm women play supporting roles with their men counterparts, whereas males seek, through educational opportunities, non-agricultural sources of income. Agricultural extension services in India ignore the country's farm workers who are women (Bennett, 1990). The growing time constraint imposed on women by longer hours they must work to make ends meet lowers women's status and sustains high birth rates. Women think more children will help with
farm work and increase family income. When they can no longer increase their own labor burdens, women lean more heavily on the contributions of their children (Jacobson, 1993, pp. 75-77).

The research was conducted in the region around the city of Ujjain in the state of Madhya Pradesh (M.P.). In Madhya Pradesh, 70% of the population lives in rural areas and the principal occupation is agriculture. The literacy rate for Madhya Pradesh is 22%, but the rate for women is only 15% (2% rural and 13% urban). (Literacy Statistics in India, 1981, p. 1). Improving literacy skills has a beneficial impact on economic conditions and social conditions and social development. One of the best solutions to poverty in this region is to improve human communication through literacy education. Proper planning, training, and implementation of literacy programs are essential for the empowerment of rural women.

Sen and Grown's thesis suggests that women's organizations and government agencies are a strategy for educating lower-level planners and functionaries, especially women, poor, and oppressed in the Third World societies. Only then will literacy be a meaningful result. (Sen and Grown 1987, p.88).

In the last decades of international development, women are recognized as a vital human resource. Any development program that proceeds without women's participation is self-defeating because of the potential loss of the contribution of this vital resource. In addition, ignoring women's participation in development has consequences not only on the family level, but also on some sectors of the economy such as agriculture where women are more involved in farm work than men. The consequence of gender bias at the family level is the failure of development programs to bring benefits to all members of the society. The consequences on some economic sectors are under-utilizing women's capacities for employing their resources inefficiently (United Nations, 1980, pp. 55-56).

Development strategies should strive to reduce gender bias and its consequences to solve many of the economic and social problems. The focus of adult education should be on such issues as violence against women, sex tourism, and sexual exploitation. Development programs should counteract the fundamental religious forces opposed to women's rights. Positive transformation of society takes political will with women as full and equal participants on all levels (Sen and Grown, 1987, pp. 89-96; Jacobson 1993, pp. 76-77).

Women must be active participants in planning, implementing, and evaluating development programs. Literacy education of women has been called by the World Bank one of the best investments a country can make for its future growth and welfare (United Nations, 1980, pp. 18-40).

**Purpose**

The purpose of the adult education training program was to train adult educators through Paulo Freire's dialogue methodology and then the trained adult educators teach adult literacy to the adult learners in Madhya Pradesh (India).

**Objectives**

1. Identify existing adult education theories and concepts related to adult education
2. Identify adult education teaching methods.
3. Develop a profile of adult educators and adult learners (women) to provide a guide of adult educators' and adult learners' characteristics in the development of the proposed program.
4. Develop a program to train adult educators to become effective adult educators.
**Methodology**

The work of Paulo Freire demonstrates that agricultural extension, adult education, and other facets of "development" can be part of a "Global social process" (Drummond 1975, p. 44). In Latin America, many prefer to call this approach "Liberation" (Gutierrez 1971). Freire emphasized the idea that only a "critical consciousness" of a problem will lead to an integrated plan and promise of future success in development work.

Even those who promote "working within the system" have pointed out that previous development efforts have failed because they were implemented "top-down" and did not start with the local people. Development efforts must be integrated with direct participation of the poor (Drummond, 1975, pp. 2-3).

Freire's methodology emphasizes that an awakening of critical consciousness, "concientizacao" (a word coined by Freire) is necessary so individuals can both critically analyze their world and become aware of their own dignity as human beings. Freire refers to this latter process as "humanization." Educators and students are regarded as coworkers and the teaching/learning process as "dialogical exchange" involving in-posing, problem solving, reflection, and action. Freire's methodology focuses on the human learning process in groups (Freire 1970, pp. 19-25).

Freire opposes the "banking concept of education." Knowledge is given by the educators to the learners, who passively receive it; man is in the world, not with the world or others. In a traditional educational system, education becomes an act of depositing in which the educator is the depositor, and the learners are allowed to receive and store the deposits. With Freire's approach, by contrast, the educational goal becomes posing and solving problems and their relationships with the world (Freire, 1970, p. 66).

Previous educational development programs (in health or other fields) have focused on content and have tried, without success, to impose "modern" ideas, derived from Western culture, on the cultures of developing countries (Stone, 1983).

In the fields of development, the work of Robert Chambers corresponds with that of Freire although Chambers presents his ideas through concepts and a framework more familiar to anthropologists. What Freire called "culture" Chambers calls "indigenous knowledge."

Both Chambers and Freire emphasize that 1) development must begin with the local people themselves; 2) the development process must begin with the knowledge of the local people; 3) there is an inescapable political dimension to poverty and development efforts; and 4) when the process of development begins with the people's knowledge and experience it will result in raising the "critical awareness" of the people. The poor must be organized, articulate in expressing their ideas, and active politically in demanding their share and their rights (Chambers, 1983, pp. 83-162).

Freire's (1970) "Pedagogy of the oppressed" enables the poor to look critically at their world, to overcome their "culture of silence", and to take control of their own destinies. Chambers feels Freire's approach has been an inspiration for those seeking a method of research in which rural people are actors rather than objects of observation and sources of data (Chambers, 1983, p. 73).

Chambers suggests that outsiders can play positive roles within any kind of rural development programs by 1) starting with the priorities and strategies of the rural poor; 2) becoming partners with rural people in demanding more control of the benefits of development; and 3) examining the causes of poverty and constraints to development in order to discover opportunities to gain control over assets. Action must tackle poverty and powerlessness, allowing the poor to mobilize,
organize, and demand and maintain control over assets and income (Chambers, 1983, p.140).

The best approach for an outsider in development is to engage in dialogue with the poor and make an effort to learn what their priorities are. "Among these, a first step is for outside professionals, the bearers of modern scientific knowledge, to step down off their pedestals, and sit down, listen, and learn." (Chambers, 1983, p.101).

Chambers takes a look at poverty from the inside out and finds five clusters of disadvantages: Poverty itself which creates physical weakness (e.g., lacking food, sickness and accidents), vulnerability (e.g., disease, birth, death, wedding, and dowry) which leads the poor to live in isolation and that promotes powerlessness (lack of benefits and lack of ability to bargain) which perpetuate poverty. This five-point chain becomes a vicious circle of poverty or a "deprivation trap" in which the poor people are caught. They do not have power, political or economic, so that in the end they have no voice (Chambers, 1983, pp.103-112).

Chambers advocates a participatory research method for development in which local people and outsiders are partners, both doing the research together. Participatory research encourages a respect for the poor and a sensitivity to their situation. Chambers suggests that participatory research can shift initiative to poor people enabling them to use and develop their own skills, knowledge, and power (Chambers, 1983, p.74).

Freire's dialogue method (two-way communication) between teacher and learner together fosters participation in this process that is based on the following steps: 1) introduction of the theme; 2) definition of the theme; 3) analysis of the problem; 4) consideration of the cause or causes; 5) consideration of a situation to with the intent of changing it by taking action; 6) reflection on solutions and action.

**Procedure**

Freire's dialogue method for literacy training was used with success in Brazil and later in other Latin American countries. The author became interested in testing this model by applying it in an Indian context. Cross-culturally, Freire's approach has been tested in grass-roots communities in Canada and in the United States. Participatory research is both a method and a strategy of social investigation and social action within an adult education framework. Participatory research is compared with traditional research strategies, and defining principles are outlined, together with specific examples of its application and practical issues both today and in the future (Hall, 1984, pp.289-299). Participatory research, coupled with Freire's dialogue method of problem posing and problem-solving, was adopted in the literacy project in Ujjain, M.P., India.

In Ujjain, both governmental and non-governmental agencies are involved in adult education programs. Some are university-based and some are Panchayat (village-council)-based. These University and Panchayat training programs serve as the home base for a large agricultural extension and adult education program which works through rural education centers and in direct interaction with villagers or urban slum dwellers. The villagers/adult learners come to the centers for literacy training and other kinds of education dealing with issues in agriculture, nutrition, and population.

The team and the author visited the university centers to conduct "participant observation", and to collect background information. But since there is a total of 400 university centers and 613 Panchayat centers, visiting all of them would have been impossible. The 15 centers in villages and 15 in urban areas were randomly selected. At each center, the team intensively but informally interviewed the educators and the adult participants about their own educational backgrounds and their opinions about various social issues in Indian educational development. After interviewing, some of the adult educators
who showed interest voluntarily included themselves in the interdisciplinary team.

The "participant observation" work also carried over into the communities where the centers were located. In these communities, the team collected information on demography, socio-economic conditions, nutrition, health, child health care, sanitation, women's problems (such as dowry, divorce, and reproduction) and information on some specific cultural practices, such as early marriage with the adult participants at the centers. The researchers tried to obtain information on the relevance of adult education to the learners' day-to-day lives, and on adult education needs of their communities.

Using the background information, a pre- and post-test questionnaire was developed by the research team with the involvement of the adult educators and learners in the local language. The questionnaire was reviewed for content validity and reliability by a research team of experts in agricultural extension and adult education. The data were collected from the respondents by using an ordinal scale with points ranging from 4 (high) to 1 (low). "0" indicated that the respondent was unable to answer the question. The questions were grouped into four variables: 1) method, which deals with teaching and learning transactions such as lecture and dialogue; 2) content, which determined the subject information and the relevance of learning that subject; 3) material of teaching and learning, which pertains to physical materials used in teaching and learning; and 4) evaluation, which measures the effectiveness and success of the program.

Through the pre-test, adult educators reported the following problems with the adult education program at Vikram University: 1) the curriculum and instructions were created by higher administration supervisors and the project officers without the educators' input; 2) the curriculum was irrelevant to learners' needs; 3) the accepted teaching method consisted solely of an instructor lecturing to their students; and 4) educators did not have full freedom to teach according to learners' needs because their classes were randomly supervised and curricula handed over to them by respective project officers.

The research generated both qualitative and quantitative data. The qualitative data included: 1) photographs, paintings, drawings, and length in-depth interviews (usually tape-recorded) with the adult learners focusing on the "stories" of their lives so that learners' problems and needs could be included in the content of curricula; and 2) "participant observation" information used to form pre-test questionnaires. From the data of pre-test, a curriculum was prepared for the adult educators' training workshop.

The quantitative data were based on pre- and post-tests. The questions were answered using an ordinal scale, 4 (high) to 1 (low). A dot (.) was used when the respondents were unable to answer the question or when the answer was missing. The missing values were replaced by means of the samples.

The Wilcoxon Test (non-parametric test) was applied to the pre-and post-tests for both adult educators and learners. The Wilcoxon Test can compute the sum of the ranks for each of the samples. A procedure which was analogous to that used in the difference-of-means test. A difference-of-sums of the ranks for each different sample, subtracting from this difference a quantity represented the expected difference under the null hypothesis. This difference of differences, which is analogous to \((X_1 - X_2 - (M_1 - M_2))\), was then divided by the standard error in order to obtain \(Z\). The analogy was not perfect, since it dealt with sums of ranks rather than means of ranks, but the parallel with the difference-of-means test was obvious. A large numerical value of \(Z\) would lead to rejection of the null hypothesis (Blalock, 1979, pp.259-264). A null hypothesis was used to show no significant relationship between any two variables (method, content, material, and evaluation), which were tested and rejected in favor of the alternative hypothesis \((H_0: \text{no } \beta = 0, H_a: \text{sign. } \beta \neq 0)\) if the relationship proves
significant. In each case the significant level of rejection was set at $p = 0.05$. The Wilcoxon Test was computed by SAS (Statistical Analysis System).

The research project was coordinated through these ongoing programs. The research was affiliated with Vikram University in Ujjain, and a multi-disciplinary team of professionals was selected from the University to assist with the research. The team along with researchers, designed and implemented a training workshop for one month. Fifty women adult educators from Vikram University who were already working as adult educators, introduced to Freire's dialogue method in the workshop. After the training, this new program was implemented at five centers. The newly trained educators went back to teach adult literacy to women. The adult educators served in their respective communities' adult education centers for two months, applying the dialogue method to their adult education programs. After two months, a post-test was conducted for both the fifty adult educators and one hundred adult learners to evaluate whether dialogue method was working for both the adult educators and adult learners.

Results

On the pre-test the adult educators and learners answered questions about the traditional education system in which instructions, lecture method, teaching material, and curriculum were prepared without educators' and learners' involvement in planning, and implemented by the government project officers and evaluation was done also by the government officers. Questions were related to the four variables. Many were unable to answer a question such as: "Are you familiar with Freire's dialogue method of teaching and learning?" Before introducing Freire's dialogue method, it was necessary to know how many educators and learners knew the method. For example, in the traditional education system, as it is mentioned above, content of the lecture training was not related to daily life problems, and learners had not participated in making their learning/teaching material. They expressed a need for change.

After the dialogue method training workshop for the adult educators, a post-test was given. The post-test had mixed questions related to the lecture training method and the dialogue training method in terms of the four variables. In all the four variables of the post-test (See Table 2) the scores were higher than the pre-test (See Table 1). There was a significant difference in the results and the Ho (null hypothesis) was rejected for all four variables. Similarly, the pre-test given to the learners showed a small significant relationship (See Table 3). In the post-test, adult learners showed a more significant change than their pre-test scores (See Table 4). The mean score for the four variables is much higher in the post-test compared to the pre-test for both adult educators and adult learners. The null hypothesis is rejected because $p < Z$.

All the $H_o$ variables showed significant results for the adult educators group. This indicated that the dialogue method of teaching was favored, the same being the case for the adult learners dialogue method of learning.
Table 1

Adult Educator: Pre-Test Analysis for Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Sum of Scores</th>
<th>Std. Dev. Under $H_0$</th>
<th>Mean</th>
<th>Z</th>
<th>Signif.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>50</td>
<td>2522.00</td>
<td>136.74</td>
<td>50.44</td>
<td>0.0183</td>
<td>--</td>
</tr>
<tr>
<td>Content</td>
<td>50</td>
<td>3066.50</td>
<td>139.69</td>
<td>139.69</td>
<td>3.8730</td>
<td>0.01</td>
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<tr>
<td>Material</td>
<td>50</td>
<td>2133.50</td>
<td>139.01</td>
<td>49.67</td>
<td>2.8128</td>
<td>0.01</td>
</tr>
<tr>
<td>Evaluation</td>
<td>50</td>
<td>2730.50</td>
<td>135.91</td>
<td>34.61</td>
<td>1.5083</td>
<td>--</td>
</tr>
</tbody>
</table>

Table 2

Adult Educator: Post-Test Analysis for Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Sum of Scores</th>
<th>Std. Dev. Under $H_0$</th>
<th>Mean</th>
<th>Z</th>
<th>Signif.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>50</td>
<td>3775.00</td>
<td>140.03</td>
<td>75.5</td>
<td>8.9230</td>
<td>0.01</td>
</tr>
<tr>
<td>Content</td>
<td>50</td>
<td>3775.00</td>
<td>136.44</td>
<td>75.5</td>
<td>9.1576</td>
<td>0.01</td>
</tr>
<tr>
<td>Material</td>
<td>50</td>
<td>3775.00</td>
<td>143.91</td>
<td>75.5</td>
<td>9.3005</td>
<td>0.01</td>
</tr>
<tr>
<td>Evaluation</td>
<td>50</td>
<td>3775.00</td>
<td>134.35</td>
<td>75.5</td>
<td>9.0302</td>
<td>0.01</td>
</tr>
</tbody>
</table>
### Table 3

**Adult Learners: Pre-Test Analysis for Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Sum of Scores</th>
<th>Std. Dev. Under H₀</th>
<th>Mean</th>
<th>Z</th>
<th>Signif.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>100</td>
<td>8613.50</td>
<td>392.39</td>
<td>86.13</td>
<td>3.6596</td>
<td>--</td>
</tr>
<tr>
<td>Content</td>
<td>100</td>
<td>6621.00</td>
<td>395.73</td>
<td>66.21</td>
<td>8.6636</td>
<td>0.01</td>
</tr>
<tr>
<td>Material</td>
<td>100</td>
<td>8595.00</td>
<td>394.21</td>
<td>85.95</td>
<td>3.6897</td>
<td>0.01</td>
</tr>
<tr>
<td>Evaluation</td>
<td>100</td>
<td>9159.50</td>
<td>392.78</td>
<td>91.59</td>
<td>2.2659</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4

**Adult Learners: Post-Test Analysis for Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Sum of Scores</th>
<th>Std. Dev. Under H₀</th>
<th>Mean</th>
<th>Z</th>
<th>Signif.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
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<td>1505.00</td>
<td>396.34</td>
<td>150.50</td>
<td>12.6143</td>
<td>0.01</td>
</tr>
<tr>
<td>Content</td>
<td>100</td>
<td>1505.00</td>
<td>394.09</td>
<td>150.50</td>
<td>12.6863</td>
<td>0.01</td>
</tr>
<tr>
<td>Material</td>
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<td>1505.00</td>
<td>386.59</td>
<td>150.50</td>
<td>12.9323</td>
<td>0.01</td>
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<td>Evaluation</td>
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<td>1505.00</td>
<td>396.03</td>
<td>150.50</td>
<td>12.6153</td>
<td>0.01</td>
</tr>
</tbody>
</table>

The quantitative data were based on direct observations, discussions with research team members and interviews with the adult educators and adult learners. These qualitative data overwhelmingly support the assertion that Freire's methodology does work well in Indian literacy programs in the sense that it brings about a more active and grass-roots participation of local people. There were three pieces of qualitative evidence to support this assertion. First, the research team and adult researchers observed the high level or enthusiasm exhibited by participants.

Quantitative data on pre-test and post-test results support the author's hypothesis using Freire's methodology. This active, enthusiastic participation was far beyond that observed at the centers during the "participant observation". For example, first adult educators and later adult learners, were able to pick up on the "themes" introduced through the dialogue method, and translate them into articulate and critical discussions of their own life problems. Second, the dialogue method and ideology were used to begin addressing problems between groups caught up in the education bureaucracy. For example, the adult educators of the project organized together to meet with the higher administration to bring about a more open dialogue about their problems in the adult education program. This kind of positive action is rare within India's development bureaucracies. Third, this adult education research project demonstrated that Freire's method and ideas can reverse the directions of communication channels in the development process. Before the introduction of the project, the communication channel was a top-down approach, but by the time of the post-test, the communication channel had become just the opposite--a bottom-up approach--which is very necessary for grass-root
development. This is convincing evidence that the dialogue method can bring about a more meaningful kind of development to empower women through adult education.

**Conclusion**

"Critical awareness" is a more democratic and holistic approach to development. Literacy is a tool to empower women. Literate people can more easily demand and protect their rights in order to change and improve their situations. At the same time they can organize themselves for their collective struggle. For poor people, genuine development means becoming critical of, and protesting against, the prevailing models of development. The literacy programs taught through Vikram University in Ujjain still continue to utilize the dialogue and participatory research methods. Each annual evaluation of the agricultural extension and education programs provides clear proof that there is increasing evidence that graduates of these programs are gaining more power and influence in their families, communities, and society.

**References**


WHAT CHARACTERIZES AN INTERNATIONALIZED U.S. EXTENSION SYSTEM?

Barbara G. Ludwig, District Director
Ohio State University Extension
Wooster, Ohio

Outstanding Research Presentation

This paper is one of five outstanding research papers from the Eleventh Annual Meeting of the Association for International Agricultural and Extension Education, Little Rock, Arkansas, U.S.A., March 23, 24 & 25, 1995.

Introduction

What characterizes an internationalized extension system in the U.S.? A seemingly simple question, but one which few individuals have sought to address through research. Henson (1990) in his study of university internationalization stated that internationalization was frequently viewed in general, rather amorphous terms that were difficult for some to understand and comprehend. Arum and Van de Water (1992) in their book Bridges to the Future: Strategies for Internationalizing Higher Education supported this view. In article after article, report after report, and at conference after conference the terms used to characterize the international dimension of education vary tremendously.

A review of literature revealed broad, but often ambiguous goal statements related to internationalization of Extension (ES-USDA, 1989; Ingle, 1990; King & Martin, 1991). Some ideas have been formulated for internationalizing (Somersan, 1992; Henson, Noel, Gilrad-Byers, Ingle, 1991; ES-USDA, 1989; Knox, 1987; York, 1984; Patton, 1984), but there has been little emphasis on implementation by Extension systems across the country (Rosson & Sanders, 1991; Poston & O'Rourke, 1991; Andrews & Lambur, 1986). Few studies have been conducted related to internationalization of the Extension component of the land-grant university system.

None defined internationalizing in terms of objectively verifiable indicators of success. A need to examine and improve the understanding of internationalizing of a state university Extension system became apparent through a review of literature. If the characteristics of an internationalized extension system could be identified, then an organization might focus available resources to create changes needed to achieve internationalization.

Kaufman (1982, 1992) suggested putting problems into the context of what is and what should be when dealing with organizations. The Organizational Elements Model (OEM) developed by Kaufman (1982, 1992) provided a framework for the study. Kaufman's model used a holistic framework in looking at organizations and what those organizations use, do and deliver as well as the impact on clients and society in general. The current study was limited to examining organizational efforts comprised of inputs and processes and organizational results comprised of products and outputs.

Purpose of the Study

The purpose of the study was to identify characteristics that will describe an internationalized state extension system.

Methodology

The study used a three-round, modified Delphi technique to explore and describe the characteristics of an internationalized state Extension system. Delphi, a group process,
utilized individual written responses to three researcher developed instruments as opposed to bringing individuals together for oral discussion. The process was further characterized by multiple iterations or feedback designed to accomplish convergence of opinion. The Delphi Panel members were purposefully selected following a nomination process. A total of 15 individuals, well known and respected for their contributions to Extension or land-grant colleges or universities in the area of internationalization, were identified. The Delphi Panel was asked to identify the degree to which they believed each item on the instrument contributed to the internationalization of a state university Extension system. A seven point Likert-type scale was used with 0 indicating "no importance" and 6 indicating "critical importance".

The initial instrument contained 39 position statements derived from the literature and structured interviews with international experts. Face and content validity of the initial instrument were assured through the use of a content validity panel. Given the nature of the Delphi technique, additional types of validity and reliability estimates were not appropriate for the instrument (Hughes, 1993; Dalkey, Rourke, Lewis and Snyder, 1972). During Round II, based on suggestions from the Delphi Panel, 12 new items were added and nine items were reworded. The instruments used in the second and third rounds contained items on which a predetermined level of consensus was not achieved during the previous round.

Descriptive statistics were calculated for each round. The computer program SPSS was used for data analysis. For each round, items on which consensus was reached were identified. Consensus on an item was considered to have been reached when 80% of the ratings fell within two categories on a seven-point scale. Following Round III, statistics of central tendency and variability were calculated for all items on which consensus had been reached. The mean was used to describe the level of importance of the item to an internationalized state Extension system as determined by consensus of the Delphi Panel.

Results

The results of the study represent the collective opinion of the experts participating in the Delphi Panel at a single point in time and cannot be construed to be representative of any other population or situation. Fourteen of the 15 participants responded to each round, a 93% response rate. Fifty-one items were considered during the three rounds of the Delphi. Consensus was achieved on 38 items which were identified as having moderately high importance to critical importance for the internationalization of a state university Extension system. Consensus was not achieved on thirteen items after three rounds. Comments made by the Delphi Panel during each round and reported anonymously provided additional information to describe the ratings and clarify issues. Three hundred and sixteen comments were received.

Following Kaufman's model (1982, 1992), the results were categorized as Organizational Efforts and Organizational Results. Organizational efforts were comprised of inputs and processes. Inputs were identified as the existing starting conditions effecting organizational activities and processes as the means, methods and procedures necessary for managing inputs. Organizational results were comprised of products and outputs. Products were defined as the internal results accomplished through the application of inputs and processes; outputs were the products the organization delivered to external clients.

Organizational Efforts

Organizational Efforts were comprised of inputs and processes (Kaufman, 1982, 1992). An input of critical importance to the internationalization of Extension systems was recognition by faculty and agents of the relationship between international issues and the Extension mission. Panel members suggested that recognition of this relationship should be the first step in the process of internationalizing. The international issues
would include, but not be limited to knowledge of international agriculture, commitment to human development, the significance of the debate on "privatization" and the experiences of Extension services in seeking new ways of funding services. A commitment to international education as a part of the Extension mission, an organizational culture that expects international activity and administrators who communicated support for internationalization were also viewed as highly important inputs.

Institutional commitment would be evidenced through three processes: the development of a personnel evaluation system which recognized international efforts had critical importance. Policies and procedures which facilitated international program efforts and a reward structure which recognized and rewarded internationalization were viewed as highly important. The system of rewards would include merit adjustments, tenure, promotion and peer recognition.

**Organizational Results**

Products identified as having critical importance to the internationalization of an Extension system included: educational programs offered in the United States that stress the impact of international economic forces on agricultural markets and Extension educators incorporating international perspectives into on-going educational activities. Incorporation of international dimensions into domestic programs to prepare students and citizens to be active participants in society and the economy was emphasized by panel members. An opinion expressed by a panel member was "one of the major problems with the successful internationalization of Cooperative Extension is lack of recognition that international content, activities, etc., are an integral part of what clientele need. Instead the development assistance mentality prevails which continues to identify within Extension, international as something separate and different from what faculty are supposed to do... Faculty need to know and learn about the potentials of international programs and activities to enhance the quality, relevance and impact of their programs and responsibilities."

By consensus of the Delphi Panel, the most critical characteristic of a state university extension system which had internationalized was the output or end product of clientele who developed a fundamental understanding of global and national interdependence. Educational programming efforts having high importance to internationalization included programs that help clientele understand complex worldwide issues, programs that train local business persons for participation in international markets and interdisciplinary international experiences for key leaders. The Delphi Panel placed high importance on targeting commodity groups for public policy education on global decision making and rural clientele for education on the international marketplace.

**Critical Elements**

Five critical elements were identified by the Delphi Panel as being present in an internationalized state university Extension system:

- Clientele develop a fundamental understanding of global and national interdependence.
- Extension educational programs within the U.S. stress the impact of international economic forces on agricultural markets.
- Extension educators incorporate international perspectives into on-going activities.
- Extension faculty/agents recognize the relationship between basic international issues and the Extension mission.
- Personnel evaluation systems recognize international efforts.

The absence of any one of these critical elements would mean that the Extension system could not
be considered to be internationalized. An internationalized state university Extension system would exhibit other important characteristics as described in Table 1. Not all the important characteristics identified by the Delphi Panel need to be present for the Extension system to be considered to be internationalized, but many are likely to be evident. Each important characteristic provides a building block, process or programming goal which will enable the Extension system to develop and maintain the five critical elements identified.

Educational Importance

The study brought greater clarity and focus to the definition of internationalization of an Extension system. Using the definition of university internationalization developed by Henson and Noel (1989) as a starting point, a three-part definition of Extension Internationalization is proposed for discussion and debate.

The definition supports Ping's (1990) assertion that internationalization is not simply a program or an activity or even an emphasis or theme in the life of the university. It is all of these things and more. The definition is based on results of the current study and reflects the five critical elements identified:

Internationalization of Extension is the incorporation of international dimension, content and considerations into Extension teaching, research and service to enhance their relevance in an increasingly interdependent world.

Participation in Extension educational activities assist clientele to develop a fundamental understanding of global interdependence and international economic forces as they relate to the issue areas within Extension's mission.

Institutional commitment is evidenced by the development of a structure and capacity to support staff development and reward accomplishments.

Poston and O'Rourke (1991) reported 80% of Extension directors indicated their state had achieved either a low level or had not achieved any level of globalization. For these Extension systems, internationalization will represent a significant organizational change. Identification of characteristics essential to an internationalized Extension system can assist Extension leaders and university administrators to identify and focus available resources where the greatest impact or change can be realized. A clear sense of direction, strong leadership in internationalizing and enthusiasm from leaders of the organization will help to ensure concerted and sustained action. Policy and resource decisions such as the incorporation of fiscal support into the ongoing Extension budget and placing a person "in charge" of internationalization to support and coordinate Extension program and activities, are necessary implementation strategies. Assessment must focus on the outcomes achieved. Organizational change is a slow and often discontinuous process in a complex organization. Ongoing assessment of the progress being made will be necessary.

Extension educators have the responsibility to help clientele develop a better understanding of the complexity of global issues. Issues that might be initially targeted include human health, the environment, diversity, renewable resources, and the agricultural market. Extension "typically tries to be responsive to local needs. But few people recognize a need for international education. This is where international education needs leadership from Extension programmers who can see a need that may be invisible to the general population" was a comment made by a panel member. Extension may have a unique role to play in helping traditional rural and agricultural clientele to recognize the need for education on international issues.

One outcome of the current study was the generation of additional questions and avenues for research. Research in the area of internationalization of Extension has been limited and the current study has perhaps raised as many questions as it has provided answers.
Replication of the current study is suggested. The Delphi Study concluded with 13 items where consensus was not reached by the Delphi Panel. Further examination and exploration of these items is needed. The instrument, developed and refined through three rounds of the Delphi, might be adapted and used to survey other populations to determine and compare their attitudes toward characteristics of an internationalized Extension system. Other issues to be explored include: Can the factor(s) which stimulated an uninvolved Extension system to change and begin the process of becoming internationalized be identified? What characteristics do state Extension systems, which by reputation are considered internationalized, exhibit? How do these characteristics compare with the characteristics identified by the current study?

Internationalization produces citizens and leaders better able to compete and to cooperate with others. Trends and events highlight the interdependence of the world community which moves year by year toward economic, political and social interdependence. (Ping, 1990; Somersan, 1992; Firebaugh, 1990; Haverner, 1988). Internationalization efforts undertaken by Extension will produce leaders and a citizenry sensitive to other cultures and global issues. Extension internationalization efforts will enable communities and nations to live and work more productively. Finally, internationalization should not be viewed as a fourth dimension: teaching, research, service and international. Instead, successful internationalization efforts will integrate global perspectives into the basic mission and mandate of Extension.

References


Table 1

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
<th>SD</th>
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<tbody>
<tr>
<td>Clientele develop a fundamental understanding of global and national interdependence.</td>
<td>5.85</td>
<td>.38</td>
</tr>
<tr>
<td>Extension educational programs within the U.S. stress the impact of international economic forces on agricultural markets.</td>
<td>5.69</td>
<td>.86</td>
</tr>
<tr>
<td>Extension educators incorporate international perspectives into on-going educational activities.</td>
<td>5.54</td>
<td>.66</td>
</tr>
<tr>
<td>Extension faculty/agents recognize the relationships between basic international issues (e.g. knowledge of international agriculture, commitment to human development, significance of privatization) and the Extension mission.</td>
<td>5.54</td>
<td>.66</td>
</tr>
<tr>
<td>Personnel evaluation systems recognize international efforts.</td>
<td>5.50</td>
<td>.76</td>
</tr>
<tr>
<td>Key leaders participate in interdisciplinary international experiences.</td>
<td>5.36</td>
<td>.74</td>
</tr>
<tr>
<td>Sensitivity to diversity issues by Extension clientele is enhanced.</td>
<td>5.36</td>
<td>.63</td>
</tr>
<tr>
<td>Reward structure recognizes internationalization in its system of rewards. These include merit adjustments, tenure, promotion, and peer recognition.</td>
<td>5.31</td>
<td>.63</td>
</tr>
<tr>
<td>Financial support for internationalizing activities is available.</td>
<td>5.21</td>
<td>.43</td>
</tr>
<tr>
<td>Administrators clearly communicate support for internationalization.</td>
<td>5.14</td>
<td>.66</td>
</tr>
<tr>
<td>A person(s) is identified to provide leadership to internationalizing efforts.</td>
<td>5.14</td>
<td>.53</td>
</tr>
<tr>
<td>International experiences are provided for county agents who do not have faculty status.</td>
<td>5.08</td>
<td>.64</td>
</tr>
<tr>
<td>Policy and operating procedures facilitate international program efforts.</td>
<td>5.07</td>
<td>.62</td>
</tr>
<tr>
<td>The organization culture expects international activity.</td>
<td>5.07</td>
<td>.62</td>
</tr>
<tr>
<td>Extension educators assist communities in building a sense of responsibility for wise use of natural resources in the context of global trends.</td>
<td>5.07</td>
<td>.62</td>
</tr>
<tr>
<td>Faculty increase their expertise by interacting with faculty and scholars from other cultures.</td>
<td>5.07</td>
<td>.47</td>
</tr>
<tr>
<td>Human and physical resources are allocated to support the integration of international activities in the overall institution effort.</td>
<td>5.07</td>
<td>.47</td>
</tr>
<tr>
<td>Opportunities for international experiences are provided for administrators.</td>
<td>5.00</td>
<td>.55</td>
</tr>
<tr>
<td>The central mission of the Extension system includes a commitment to international education.</td>
<td>5.00</td>
<td>.55</td>
</tr>
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</table>

Scale: 0 = No Importance; 1 = Slight Importance; 2 = Limited Importance; 3 = Moderate Importance; 4 = Moderately High Importance; 5 = High Importance; 6 = Critical Importance
RURAL WOMENS’ ACCESS TO AGRICULTURAL INFORMATION: 
A PARTICIPATORY STUDY OF TWO HONDURAN COMMUNITIES

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Outstanding Research Presentation

This paper is one of five outstanding research papers from the Eleventh Annual Meeting of the Association for International Agricultural and Extension Education, Little Rock, Arkansas, U.S.A., March 23, 24 & 25, 1995.

Abstract

Rural women farmers are inadequately served by existing extension services. Numerous factors contribute to this lack, including government policies, cultural constraints, extension's focus on male farmers, and women's lack of access to resources.

This study examines ways that Honduran women farmers receive agricultural information. Using participatory research, individual women, women's groups, and organizations are interviewed to determine training they received and training they desire. Issues related to quality of training are also explored. Recommendations for development organizations to improve their outreach to women farmers are included.

Introduction

Farmers traditionally receive agricultural information from government ministries of agriculture or extension offices. Although women constitute a sizable and growing percentage of the agricultural workforce worldwide, women farmers are generally ignored in extension programs (Jiggins, 1986).

Several factors contribute to this ignorance including government policies, cultural constraints, extension's focus on resource rich, often male farmers, and women's lack of formal education (Chaney and Lewis, 1985; Spens, 1986).

Agricultural extension staffs in virtually any country are composed primarily of male agents (Spring, 1987). This lack of female extensionists is a tremendous problem in cultures that discourage interactions between unmarried males and females. Rural Honduran campesinas will not readily interact with male extensionists, particularly if their husbands are present. This decreases the potential for information exchange. So do high levels of illiteracy, as many women simply cannot read extension materials that may be available.

Extension's ineffectiveness also reflects several faulty assumptions. Gura (1985) notes that extension agents generally work with heads of households (assumed to be male), concentrate on commercial rather than food crops (usually grown by women), and assume that information given to one family member (usually the male) is shared with other members of the household.

Moser (1991) identifies three categories of work that Honduran women engage in on a daily basis: reproductive, productive, and community work. Reproductive work encompasses not only biological reproduction, but the instilling of cultural values into male and female children. Productive work involves activities that generate products for sale, exchange, or home consumption. Many rural women select
occupations that allow them to accommodate
their other responsibilities such as the
production and sale of food or textiles. Income
generation for these activities is often at the
lowest end of the economic spectrum.

Womens' agricultural responsibilities overlap
both the productive and reproductive categories.
These duties vary by region. In western
Honduras they care for and milk family
animals, plant, and harvest crops for consumption and sale. Elsewhere they
participate in agricultural tasks associated with
basic grains such as weeding and harvesting (Zuniga, 1994). Throughout the country women
and girls raise and care for small livestock,
including chickens, ducks, pigs, rabbits, and
goats. These animals are rarely eaten by the
family, but used for "insurance" to sell when
money is needed (SNV, 1993).

Over the past decade there have been changes in
the relationship between the economically active
population, (PEA), migration patterns, and
gender. In 1988 a study of sixteen Honduran
cities estimated 55% of the PEA to be women.
However, these women (62%) were concentrated
in low-paying, informal jobs such as handicrafts
and domestic work (PREALC, 1988). Economic
activities in the informal sector allow women to
mesh with their reproductive responsibilities,
but limit their ability to become economically
solvent. Women migrate more often than males
in search of jobs. Usually younger women (15 - 19 and 25 - 29) and children are the ones who
leave rural villages (Zeitun and Lam, 1991). In
addition to increased migration, women are
more frequently becoming heads of households
in Honduras. Zuniga (1994) estimates that
between 25-30% of all households have women
as their primary financial support.

Due to economic hardship many women seek
income generating activities that allow them to
mesh child care and domestic duties. Women
who leave rural environments in search of work
often create more precarious situations for
themselves and their families by moving to
urban slums.

There is a need to provide incentives for women
to remain in rural areas by improving access to
resources and increasing their agricultural
productivity. Extension can play a role as a
provider of agricultural information, and as a
collaborator with other institutions to increase
womens' access to resources.

Purpose of Research

This research engages individual women farmers, women farmer groups, and
organizations providing agricultural information, in focused dialogue sessions about womens' access to agricultural information. In the process of discussing these issues, the women "uncover" alternatives to increase their access to resources. They meet with representatives from agricultural organizations to discuss their recommendations, and outline suggestions for implementation. Organizations involved in this research enhance their collaborative efforts, and become more aware of ways to improve their outreach to women farmers.

Methodology

Participatory Action Research (PRA) is the methodology I selected for dialoging with women about issues related to access of agricultural information. PRA developed within the framework of a "qualitative" approach to social research, examining people in a multi-dimensional setting. It emphasizes the principles of subjectivity, involvement, and consensual validation in order to develop methods of data collection and analysis (Tandon, 1988). The goal of PRA is improvement of lives by increasing peoples' awareness of their situation and facilitating structural transformation (Hall, 1981). Louden (1988) and Jiggins (1986) emphasize the importance of considering women in a participative context when formulating projects. PRA is particularly appropriate to this project as the women are involved in gathering information to solve their own problems, a characteristic of action research (Patton, 1990).
The research occurred over a six month period from January through July 1994, based at the Pan American Agricultural School (Zamorano) in Honduras. Collaborating organizations were Zamorano and Heifer Project International/Christian Development Commission (HPI/CCD). Zamorano and HPI have worked together in the past, and both expressed interest in developing ways to improve their outreach to women farmers. I conducted interviews with individual women farmers, women farmer groups, and organizations providing agricultural information using an open-ended questionnaire. This questionnaire was modified as information became available, and additional areas of importance to the women were added. Interviews, observation of the women’s daily activities, and collection of secondary data about issues related to women’s access to resources were the primary methodologies used in this research.

Assisted by each organization's administrative head, I selected two research sites with as much variation as possible to pursue questioning and dialogue in depth. Selection criteria included: length of time organization was in community, organization's work with women, types of agricultural work women do in the region, and accessibility from Zamorano. The initial visit to each community was with an extensionist, giving an acceptable introduction to the women and providing background information on the organization's efforts in the community. Subsequent visits were made alone, visiting individual's homes, and conducting focus groups with interested women. These interviews and dialogue sessions were conducted in Spanish, and included questions about the women's daily work, access to resources, types of training received, and types of training desired.

To validate the interviewee's credibility, I interviewed other professionals providing agricultural information to women, women farmers outside the selected communities, and collected secondary data from institutional sources within Honduras. These interviews overlap some of the questions in the women's questionnaire, but also provide information on the types of training given and methodologies used by the organizations. LeBoterf (1983) provides a model I used to accommodate the lengthy process of participatory research, and tailor the project to the women's needs.

**Results and Conclusions**

In summarizing the results for this study, data was assigned to one of three categories: individual interview, group interview or organizational interview. Each of these categories was reviewed for themes related to: Training Given or Received, Training Desired, and Issues Related to Training for Women. These results appear in Tables 1 - 3.

Examining the interview results reveals an interesting pattern. Table 1 lists training courses or programs given by the six different types of organizations interviewed: Non-governmental, church, government, women's groups, university, Peace Corps. Review of the remaining columns of training received by groups or individuals shows there are fewer items of training received than given. This decreasing number could be due to a variety of factors, but often revolves around the organization's choice of whether or not to use community leaders. Table 3 lists issues that both the organizations interviewed and the campesinas considered important in training. The sections on "Training/Selection of Community Leaders" and "Consistency/Quality of Training" pivot on the person selected to train women in the community. If this individual is genuinely selected by the women, without bias, she must be able to participate freely in regional training programs. If she does not, the women will generally not receive training. In many cases the leader must be literate to even be considered for selection. This greatly reduces the pool of potential leaders as few women are literate. The leader must also be committed to total community development and not seeking personal gain and power.
Table 1

Training Received/Training Given

<table>
<thead>
<tr>
<th><strong>Individual Interviews</strong> (35)</th>
<th><strong>Group Interviews</strong> (11)</th>
<th><strong>Extensionists</strong> (14)</th>
<th><strong>Administrators</strong> (27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>teaching kindergarten</td>
<td>basic preventative health</td>
<td>food preparation</td>
<td></td>
</tr>
<tr>
<td>use of natural and chemical medicines</td>
<td>care of small livestock (pigs, chickens, goats)</td>
<td>small animal care</td>
<td></td>
</tr>
<tr>
<td>use of organic and non-organic fertilizers</td>
<td>family gardens</td>
<td>nutrition</td>
<td></td>
</tr>
<tr>
<td>basic nutrition</td>
<td>raising basic grains (corn and beans)</td>
<td>womens' roles in family, parenting</td>
<td></td>
</tr>
<tr>
<td>food preparation</td>
<td>vegetable raising</td>
<td>administration of projects</td>
<td></td>
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<tr>
<td>basic health care for children transplanting</td>
<td>food preparation and preserving literacy</td>
<td>home gardens</td>
<td></td>
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<tr>
<td>processing of jams</td>
<td>maternal and child health</td>
<td>child health</td>
<td></td>
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<tr>
<td>maternal health</td>
<td>bread making</td>
<td>food preparation</td>
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<tr>
<td>chicken raising</td>
<td>weaving</td>
<td>communal banks</td>
<td></td>
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<td></td>
<td>sewing</td>
<td>legal issues for women</td>
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<tr>
<td></td>
<td>nutrition</td>
<td>family planning</td>
<td></td>
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<tr>
<td></td>
<td>controlling plant diseases</td>
<td>sexually transmitted disease</td>
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<td></td>
<td>care of fruit trees</td>
<td>self-valuation</td>
<td></td>
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<td></td>
<td>soil conservation</td>
<td>natural and chemical med</td>
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<tr>
<td></td>
<td>food drying</td>
<td>maternal health and hygiene</td>
<td></td>
</tr>
<tr>
<td></td>
<td>self-valuation</td>
<td>violence against women</td>
<td></td>
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<tr>
<td></td>
<td>group formation</td>
<td>sewing</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>basic grains</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>preparation of soaps, jams, wine</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>organic/non-organic fertilizers</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>environmental awareness</td>
<td></td>
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<td></td>
<td></td>
<td>literacy</td>
<td></td>
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<td></td>
<td></td>
<td>group organization, cooperative management</td>
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<tr>
<td></td>
<td></td>
<td>small store management</td>
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<tr>
<td></td>
<td></td>
<td>raising vegetables</td>
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<tr>
<td></td>
<td></td>
<td>using corn grinders</td>
<td></td>
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<td></td>
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<td>home improvement</td>
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Another issue that surfaces when examining training issues is the cultural perception of women's work. A number of extensionists (male) state that agriculture isn't a large part of women's work and therefore isn't important to deliver. Women themselves even comment on "helping their husbands" when they are working in the fields, rather than acknowledge their own contributions. Every woman interviewed, whether individually or in a group, engaged in agricultural activities throughout the day. They also expressed great interest in receiving further training on agricultural themes. See Table 2.

Women definitely lack access to resources, and this influences their ability to participate in development projects. The most common concern for campesinas is a lack of regular water supply for growing vegetables or basic grains. Women prefer training sessions with only women present, as men tend to dominate discussions and inhibit the women's desire to speak. Both the women and organizations mention obstacles to organizing and working with women's groups, notably: lack of punctuality to meetings, lack of attendance, lack of motivation, difficulty with husband's machismo, cost of training, too many domestic responsibilities, lack of transportation, and lack of communication about meetings. Another issue that surfaced for the women was lack of project continuity. When an extensionist or program terminates, the women feel their confidence, "confianza," has been broken. It takes time to reestablish this trust with another person.

Rural women in Honduras receive minimal amounts of agricultural information through a variety of sources. These sources can be classified as: Non-governmental organizations, University based extension, Women's groups, Church groups, Government sponsored extension, and other (i.e., Peace Corps).

Data on the populations served is slim and often conflicting. Extension in any of these organizations could improve their agricultural outreach to women by implementing the following suggestions:

- Cross gender training for male and female extensionists. Each member of the village extension team could be trained equally in agriculture, health, nutrition, etc. This would "sensitize" the population they serve to women's roles in agriculture, and men's needed involvement in the family. It will also increase the efficiency of organizations hampered by limited staff.

- Improved training and evaluation for leaders. Training should occur in the villages whenever possible to encourage attendance and implementation. Follow up evaluations should be conducted with the women to assess training impacts.

- Selection of leaders should not be predicated on literacy. Rotation of leaders should be more strictly enforced to ensure equal distribution of training among all women.

- Re-evaluation of programs. Women should be more actively incorporated into developing program themes. This will encourage attendance and "ownership" of programs, reduce dependency on outside extensionists.

- Increase agricultural programs for children. Many girls attend elementary schools in Honduras. This is an opportunity to teach agriculture, with extension of this information into the homes.

Educational Importance

Honduras is a poor country, with heavy reliance on external organizations to fund training programs. To maximize the efficiency of these programs, and create an environment for project sustainability, requires reflection on the perceptions of women's work. It also mandates evaluating methods used for training extensionists and leaders, and developing new ways to motivate those who train. Men must be involved in community development, but
women prefer and perform better in single gender groups. This knowledge must be incorporated into future training programs. To continue increasing women's involvement in development requires jointly examining their needs, and casting aside previous misconceptions held by agricultural educators.

Table 2

Training Desired

**Individual**

family planning
soil preparation and conservation
nutrition
identification and treatment of plant diseases
animal health
first aid

**Group**

aquaculture
rabbit raising
financing/credit
making pastries
raising flowers
small animal care
Producing different types of food in large quantities
basic grain production
health care for children
large animal care and management
vegetable growth and disease control
Table 3

**Issues Related To Training**

<table>
<thead>
<tr>
<th></th>
<th><strong>Womens' Perceptions</strong></th>
<th><strong>Organizations' Perceptions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mixed Gender vs. Single Gender Groups</strong></td>
<td>Women prefer unmixed groups for training; presence of men inhibits discussion; one woman didn't enroll for a course because she was the only woman</td>
<td>Choice of training topic determines mixed or unmixed group; women don't receive ag training because of machismo, and women's defined roles, mixed groups is hardest with indigenous people</td>
</tr>
<tr>
<td><strong>Obstacles in Organizing/Working with Women</strong></td>
<td>Punctuality; domestic responsibilities; length of meeting, conflict with husband; attitude - don't want to participate, aren't accustomed to being organized; distance to meetings too far for pregnant women or small children</td>
<td>Punctuality, cultural constraints - machismo; physical isolation prevents organizing; training costs too high; attitude - &quot;learned hopelessness&quot;; projects need large numbers of women; slow process; competition between women</td>
</tr>
<tr>
<td><strong>Training/Selection of Leaders</strong></td>
<td>Leaders must often be literate to be selected; attendance at regional training centers difficult - distance, time, domestic responsibilities, jealousy between women; must have time to train others</td>
<td>Cross gender training for leaders, extensionists would increase awareness; leader must be committed to community development; leader must attend all training or transfer potential decreases; leader and husband need &quot;conscientization&quot; of her role; power struggles for leader; lack of leader follow-up/evaluation</td>
</tr>
<tr>
<td><strong>Consistency/Quality of Training</strong></td>
<td>Lack of &quot;trickle down&quot; from husbands, many women don't have husbands; lack of &quot;trickle down&quot; from leaders or information is forgotten; cost of training is too high, leaders don't receive pedagogical training - feel its necessary; lack of communication reduces meeting attendance</td>
<td>Lack of communication - difficult to contact women; extensionist's training may not &quot;sensitize&quot; them to women's multiple roles; difficult to access communities; if funding ends, program ends; new government = new programs; program evaluations sporadic</td>
</tr>
<tr>
<td><strong>Networking/Duplication of Organizations</strong></td>
<td>Women may want to belong to more than one group; some groups work together to provide income generating projects</td>
<td>Duplication of materials by groups; groups collaborate when they need specific projects; lack of transportation minimizes women's networking; cost collaborations</td>
</tr>
<tr>
<td><strong>Womens' Roles in Agriculture</strong></td>
<td>Plant, weed, harvest, process grains and vegetables; process, preserve fruits; plant and manage fruit trees; care for goats, rabbits, chickens, pigs, cows; soil conservation</td>
<td>Agriculture isn't a large part of women's work; girls and boys receive ag training in some schools; women working in fields are &quot;helping&quot; their husbands; some extensionists recognize the need for women's ag training</td>
</tr>
<tr>
<td><strong>Woman's Access to Resources</strong></td>
<td>Limited water access prevents growing vegetables, participation in projects; cost of training materials/seeds too high; lack of land limits participation; fewer cooperatives for women</td>
<td>Lack of water and materials (seeds, implements, fertilizers) decreases women's gardens; laws favor men - more men have land than women; access to resources after training important; limited access to credit;</td>
</tr>
<tr>
<td><strong>Dependency Issues</strong></td>
<td>Women become accustomed to receiving incentives - don't like to participate unless they receive something; group stopped providing seeds - women stopped planting vegetables; extensionist became pivot for community development when she left, women asked who would help them now?</td>
<td>Feeding programs provide no education - create dependency; mandate attendance or none comes; training programs need to motivate people</td>
</tr>
</tbody>
</table>
References


A FRAMEWORK FOR STUDYING RELEVANCE OF AGRICULTURAL EDUCATION IN THE UNITED STATES

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Abstract

Access to higher education in agriculture is limited in most developing countries. There has been heavy reliance on the United States and other developed countries to provide training and graduate degrees for agricultural professionals from developing countries. A key question for educators, government officials, and researchers is how can we promote relevant educational experiences for international students studying in the United States? This paper presents a framework for examining educational relevance to help decision makers and researchers clarify important variables, processes, and dynamics related to relevance.

What is Educational Relevance?

Broadly speaking, educational relevance can be viewed as the degree to which stakeholders' desired outcomes are achieved as a result of the educational process. Stakeholders are: (a) those who make or influence decisions or, (b) those who are influenced by others' decisions. They may have different "desired outcomes" related to the environment in which they operate. "Educational process" includes all the factors, decisions, and variables involved, from the time an educational program is considered through selection, placement, training in the United States, and supervision of the participant in a job back in the home country. Stakeholder groups, environment, and educational process (including decision phases and four types of variables) will be discussed as a basis for a model of educational relevance.

Stakeholder Groups

Five major stakeholder groups who make decisions impacting educational relevance are: (a) home country government officials who make decisions about who to send for training in the United States, what training they are to receive, and the support for their job upon their return home after training, (b) funding agencies who sponsor training in the United States, 8 participants who receive training in the United States, (d) contractors who place participants at United States universities, and monitor their progress, and (e) educators, researchers, administrators, and staff at United States institutions who design curricula and approaches for teaching and who support international students.

Each of these groups has a unique stake in educational relevance issues. Integrating these differences in perspective and desired outcomes is a key to developing relevant programs. For
example, government officials in the home country likely emphasize outcomes related to government/ministry development goals. They might be concerned, for example, that participants get skills, techniques, and appropriate technologies that can be used on the development projects when they return home.

While funding agencies presumably agree with government development goals, they are likely to view relevance within a shorter time frame that corresponds to their funding time frames. Also, funders' goals might include priorities that may not be emphasized by a host government—making sure women, minority groups, and the rural poor are represented in the candidate pool, for example.

Participants who receive training in the United States also presumably agree with government development goals. However, since in many countries individuals change jobs to gain promotions, participants are likely to emphasize professional goals when assessing relevance. Also, their training, background, and/or interests might not fit the expectations of the home government. For example, they might be trained as technical researchers, but, be expected by their government to administer programs or teach; roles that require people and process skills.

Faculty, administrators and other personnel in United States institutions also have unique perspectives. While they obviously want to provide participants skills to use upon their return home, they are likely to view relevance in other ways as well. For example, students earning master's degrees in United States colleges of agriculture might receive training more relevant to gaining entrance to a state-side Ph.D. program than to practical applications of skills back in their home countries.

Contractors who place and monitor participants in United States universities play a unique role as intermediaries between home country governments and universities. They are likely to view educational relevancy as a balancing of government, participant, and university goals and perspectives. In other words, their "stake" in the process is to help other stakeholders understand and agree on training goals, programs, content, and process. They also ensure that participants get adequate and timely support and monitor progress so that training programs are completed in an agreed-upon time frame.

**Environment**

It seems clear, then, that educational relevance may mean different things to different stakeholder groups. These differences arise because each group operates within a particular personal, cultural, economic, political, social, administrative, and legal environment. Each environment exerts unique influences that impact the decisions stakeholder groups make.

While each stakeholder group operates within a unique environment, some environments are clearly more alike than others. For instance, the home country environment exerts common influences on home country government officials and participants. On the other hand, the United States environment has common elements for United States funding agencies, placement contractors, and university personnel. A major challenge in achieving educational relevance is to work toward complementary agreements between United States stakeholders and home country stakeholders.

**Educational Process**

Educational relevance can be viewed as being impacted by a decision process that includes four phases: (a) candidate selection, (b) placement in a training institution, (c) the educational program/experience itself and (d) placement and follow-up in the home country. While we would expect that educational relevance is highly influenced by the United States educational program and the participants' experiences while in the United States, the other phases of the process are also critical for understanding educational relevance (as pointed out by Pina, 1986.) A number of variables are important for each phase of this process. In addition to the
environment discussed earlier our discussion includes three other types of variables identified by Semlak (1991) that are relevant to this decision process. These are antecedent variables, those in place before an intervention; intervening variables, those impacted by the intervention; and outcome variables, those that result from the intervention. The number of stakeholders, decisions and variables suggests the need for a model that can help researchers and decision makers clearly identify issues.

Decision Process Model of Educational Relevance

Figure 1 offers a model to help examine and explain educational relevance based on a view of educational planning as a dynamic process considering numerous variables at each phase. This model views educational relevance as dependent on a series of decisions made by various stakeholder groups. These decisions fall into four major phases. The influence of various stakeholder groups on decisions varies from phase to phase. Decisions within each phase influence decisions in subsequent phases. Decisions made in phase I influence and set the stage for decisions in phase II and so on through phase IV. The dark arrows indicate primary direction and flow of decisions from one phase to the next. The light arrows indicate potential feedback loops through which knowledge/insights gained can be used to influence future decisions related to educational relevance.

Phases of the Model

The Decision Process Model acknowledges that four types of variables; i.e., the environmental, antecedent, intervening, and outcome variables, operate within each of four phases of the process. This section illustrates the important variables, decisions and research questions in each phase of the model as outlined in Figure 1. This includes discussion of: (a) the major decisions in each phase, (b) the primary decision makers (listed in order of who likely has the most influence on the decisions in each phase), (c) the major factors influencing those decisions, (d) the primary environmental influences, (e) the desired outcome of that phase and (f) examples of possible research and/or planning questions related to that phase.

During Phase I the major decisions are the selection of the candidate and determination of the training desired for that candidate. The primary decision makers (stakeholders) are government officials working in collaboration with funding agencies, usually through development projects with specified goals. Also, potential participants are decision makers to the extent they pursue and lobby for training.

Decisions about what type of training is needed (intervening variable) are based primarily on home country development goals, funding agency goals, and the skills/education of personnel available for training (antecedent variables). Candidate selection (intervening variable) is based on antecedent factors such as the candidates' experience, education, skills, motivation and, to some extent, age, gender, and ethnic background.

The primary environmental influence of this phase is the home country, although, if United States donors are involved, priorities based on the United States environment will be represented by those donors through the goals, approaches, and priorities of their development projects.

The desired outcome of phase I is the selection of a well-qualified candidate and a clear description of the training desired for that candidate within a specified time. For United States Agency for International Development (USAID)-sponsored participants, the desired training is described in a Project Implementation Order/Participant (PIO/P) forwarded to the placement contractor with documentation of the participant's training, education, English language skills, and other required entrance documentation. Once the training need is identified and the candidate is selected (outcomes of phase I) these become antecedent variables or "givens" for decisions
made in subsequent phases.
Research questions in this phase might include:
- What information is needed to make good decisions in phase I?
- What personal characteristics of participants relate to educational relevance?
- What critical environmental factors influence selection of participants, for example, legal requirements to select participants from minority groups within the country?
- What are economic considerations for funding and filling vacant positions of those on educational leave?
- What are the relationships between decision makers at this phase? Do they agree on goals and on educational relevance?
- What are likely impacts of various factors and decisions on relevance?

Phase II represents intervening decisions related to placement of participants in a United States university degree program. The placement contractor is the primary decision maker in this phase, although host country officials can request and must give final approval for placement. University officials also have a decision-making role since they decide whether candidates are qualified for degree programs and whether they have personnel to meet their needs. Contractors and university personnel usually rely heavily on the PIO/P in selecting appropriate programs for USAID-sponsored candidates. As in phase I, participants influence this decision based on their personal interests, contacts, and rapport with other decision makers. So, phase II decisions are based primarily on the development goals, the university's ability to provide training to meet those goals, and the qualifications of the candidate to meet the entrance requirements of the university.

In phase II there is about a 50/50 split in environmental influence between the United States and the home country. The contractors play a unique and critical role in attempting to match expectations from these two environments. The goal is to gain acceptance to a high quality program responsive to the professional needs of the student and the home country goals as outlined in the PIO/P.

The desired outcome of phase II is placement of the candidate in an appropriate program. This involves a good match between home country needs; time and support available for training; the participant's skills, goals and needs; and university expertise to meet these needs.

Research questions related to phase II might include questions such as what factors within the university promote international student satisfaction or frustration? What standards for English language, course prerequisites, etc., are appropriate for international students? What evidences of meeting those standards are accepted? How do various university programs compare on student satisfaction, degree completion rates and time lines, demonstrated competency, and student ability to apply concepts in home settings? How well have graduates adapted and applied their knowledge upon returning home?

Phase III is very critical since this is where a whole series of intervention decisions are made regarding the participant's training content and process. These decisions create the educational program the participant receives. The primary decision makers are United States university faculty members. This includes the participant's academic advisor, research advisor, course instructors, and supervisors of internship and work experiences. Other university personnel making decisions connected to educational relevance arrange the participant's housing and provide other support and guidance. Participants influence decisions in phase III to the extent they are able to collaborate with other decision makers. Home country officials can also be involved in some decisions, usually through the placement contractor. For example, approval of thesis research, approval to return home to conduct research, and attendance at professional events involve decisions by contractors and home country officials.

Decisions in phase III are based on antecedent variables determined in previous phases. These include: participant performance, degree requirements, development goals and
faculty/advisor understanding of education relevance. Many intervention decisions made in this phase become antecedent variables for decisions made later in the phase. For example, decisions on a research focus influence choice of course work, faculty supervisors, internships, and conferences.

Since decisions are made by stakeholders immersed in the United States environment, their understanding of relevance from the home country perspective is critical. For example, a faculty member with the attitude "if I teach it, it is relevant" may not develop learning experiences that are beneficial to the participant or the needs of the home country.

The desired outcome of phase III is that participants earn a degree respected in academic circles and also gain the skills needed for the job they return home to fill. The degree should be earned within a reasonable agreed-upon time. The time involved, the number and critical nature of decisions made, and the dynamic nature and scope of this phase lend it to major and multiple studies. Research questions related to this phase might include the relevance of the content and process to participant career goals, home country development goals, and technological levels of development projects in the home country. Of interest also are questions related to the participant's satisfaction with the educational process; the participant's ability to adapt to the United States academic system, such as teaching approaches and testing techniques; and the participant's skills in writing and speaking English. On the other hand, questions can be raised about the ability of the university/department to adapt to the special needs of the participant. Such questions could include study of the willingness of university personnel to understand home country needs and to design relevant courses, assignments, special internships or short courses, and research projects to meet these needs. Questions about the cost effectiveness of conducting research in the home country are relevant as are examinations of cooperative arrangements among the university, the contractor, and the home country.

**Phase IV** represents decisions regarding job placement and support in the home country. Home government officials are often the primary decision makers. The participant has some say in the decision within the confines of commitments made to the government. Under ideal circumstances, the United States faculty can play a role in supporting the participant (for example, as outlined by Pina, 1986, and through USAID mission staff). Decisions in this phase can also be influenced by the economic and political realities in the home country upon the participant's return.

The desired outcome is that the decisions made in the earlier phases of the process will now yield fruit; that is, that the situation the participant returns to resembles what the decision makers had in mind as the training program was planned and carried out through decisions by the various stakeholder groups. Ideally, a well trained participant will have the capacity to adapt her/his education to the situation in the home country at the time s/he returns.

The fourth phase can be thought of as the real test of educational relevance. If participant and supervisor are pleased with the participants' applying skills gained in the United States to the home job, then the process can be rated a success. As suggested earlier, there is more to achieving success than an individual's ability to apply the skills in the home country. Many factors in addition to the participant's education influence relevance. There is a need for ongoing support in terms of appropriate placement, networking, financial support, personnel, and equipment. There is often a need for continued support from the United States educational institution, professional societies, or other professional support.

In phase IV, which can be a relatively long-term phase, researchers can raise questions related to the overall training process. How did decisions in early phases impact later phases? What approaches, methods, or techniques of
collaborating among stakeholders were effective during and between phases? What were the impacts of funding? How well did program monitoring and feedback systems work from participant to advisor, to contractor, to home country officials, and vice versa? What was the impact of antecedent and intervening variables on outcome variables? To what extent did United States education prepare participants to assess work settings and adapt constructive responses? These are just examples of research questions, at a broad level of abstraction, that could be researched for specific training programs.

**Using the Model**

The Decision Process model is designed to help researchers and decision makers more clearly define their specific research or decision-making questions. It recognizes that antecedent variables are in place at the outset of each phase. Some of these variables are static (cannot be changed) and influence the decisions in that phase. For example, gender, age, work experience of potential participants, etc., are static variables. Other variables are dynamic and can be influenced by the process; for example, maturation, apprehension/anxiety, and self-esteem of participant. Research can help us understand the relationships between static variables and educational relevance and how the process can influence dynamic variables that, in turn, can impact educational relevance.

Another important function of the model is to help decision makers and researchers examine relationships among and between the various phases of the process. Since no one researcher can conduct in-depth research on the entire process, the model can help fit current and future research into an overall scheme so that each piece of research can be better understood within an overall framework. Administrators in each phase can collaborate with decision makers in other phases when planning learning opportunities in the United States that prove highly relevant to participants from developing countries. The model presented is tentative and subject to challenge by other practitioners, scholars, and researchers. Its intent is to promote further discussion and research related to educational relevance (Aagard, 1991).

**References**


The purpose of this study was to identify New Mexico State University, College of Agriculture and Home Economics, faculty motives and perceived barriers for participating in international activities. The study utilized descriptive survey methodology. An interdepartmental mail questionnaire measured participation motives with paired Likert-type items. Qualitative data on motives and barriers were also collected. Faculty were found to be motivated by intrinsic motives such as cognizance, exposition, similance, play, achievement, nurturance and affiliation. Barriers to participation were mostly extrinsic in nature (e.g., lack of time, lack of reward and lack of language skills). Faculty who were highly motivated to participate in international activities were significantly different from those who were less than highly motivated on seven motives, and overall motivation. The primary applications drawn from these results are to focus efforts to motivate faculty to participate internationally by satisfying intrinsic motives, while reducing extrinsic barriers.

Introduction

Historically, land-grant colleges and universities have been obligated to participate in international activities. The Title XII Amendment of 1975 set a precedent for sponsoring foreign students, short courses, and increased involvement in international projects (Management Analysis Center, Inc., 1982). New Mexico State University (NMSU) has been internationalizing its curriculum, faculty, staff, and students for over 25 years by providing administrative leadership; faculty, staff, and student development programs; outreach services; and travel grants (Huntsberger, 1992). The College of Agriculture and Home Economics at NMSU is in the process of revising its promotion and tenure policies to recognize and reward faculty who participate internationally (College of Agriculture and Home Economics, 1992).

Despite challenges from university administrators, many faculty remain reluctant to participate internationally. Faculty perceptions range from concerns that participation will not be considered in evaluation, promotion, and tenure decisions, to fears of job security when they return home (Jones & Crawford, 1985; Perez & Rogers, 1984; Whitaker, 1980).

Theoretical Base

The theoretical framework for studying faculty motives for participating in international activities is derived from Murray (1938). The first three motives pertain to behaviors regarding inanimate objects. Murray's (1938, p. 80-83) definitions are: acquisition, "to gain possessions and property"; conservance, "to collect, repair, clean and preserve things"; and construction "to organize and build." The next three motives relate to the desire for accomplishment. Achievement is "to overcome obstacles," recognition is "to excite praise," and exhibition is "to attract attention to one's person." In contrast to achievement is the motive to avoid humiliation. Infavoidance is "to avoid failure and shame." The following five motives define human power. Dominance is "to organize the behavior of a group," deference is "to willingly
follow a superior," \textit{similance} is "to identify oneself with others," \textit{autonomy} is "to seek freedom in a new place," and \textit{contrarience} is "to be unique." The next motive, \textit{blamavoidance}, addresses an individual's need to remain a member of their culture: "to avoid blame or punishment by inhibiting asocial impulses." The next three motives relate to affection. \textit{Affiliation} is "to form friendships and associations," \textit{nurturance} is "to nourish or protect others," and \textit{play} is "to relax, amuse oneself, seek diversion." Finally, there are two complementary motives related to learning the teaching. \textit{Cognizance} is "to read and seek knowledge" and \textit{exposition} is "to give information, explain, interpret, lecture." A "fusion of needs" (Murray, 1938, p. 86) occurs when a single action satisfies two or more motives simultaneously and can be expected to surface with qualitative motive indicators.

Some motives for participating internationally are generally intrinsic, while others are generally extrinsic in nature. A survey conducted by the Management Analysis Center, Inc. (1982) found faculty were intrinsically motivated to participate in international assignments if they were personally satisfied by assisting in the project's success (\textit{achievement}) and by being part of the project team (\textit{affiliation}).

Faculty were extrinsically motivated to participate internationally if personal (and family) health and safety needs were met (\textit{conservance}), if the assignment effected real income (\textit{acquisition}), and current work responsibilities were addressed when considering assignments (\textit{blamavoidance}). Non-tenured faculty were more concerned with impact on careers and opportunities for spouses (\textit{achievement}) than tenured faculty. Non-tenured faculty participation in Title XII assignments depended heavily on encouragement by their department head (\textit{deference}), impact on current work, and impact on tenure (\textit{achievement}).

The strongest extrinsic motivator for faculty to participate internationally appears to be the university promotion and tenure policy (\textit{achievement}) (Aigner, et. al., 1992; Hertford & Hartley, 1987; Jones & Crawford, 1985; Perez & Rogers, 1984; SAIC, 1990; Whiteford & Schmidt, 1989). There is also a common faculty perception that an international assignment will have a detrimental effect on career (\textit{achievement}).

Whitaker (1980, p. vii) found faculty barriers to participation in international programs include "(I) appointment, promotion, and tenure policy; (ii) priority on traditional funding for state and regional programs; (iii) deficient language and cross cultural skills among faculty; (iv) salary policy; and (v) organizational structure." These barriers are all extrinsic in nature.

\textbf{Purpose and Objectives}

The purpose of the study was to determine College of Agriculture and Home Economics faculty motives and perceived barriers for participating in international activities. The specific objectives of the study were 1) to describe faculty by level of education; percent of time dedicated to teaching, research, extension, and administration; whether or not they were on a tenure track; if they were tenured; rank status (e.g., instructor, assistant, associate, or full professor); gender; and number of years on faculty at NMSU; 2) describe motives of faculty for participating in future international activities; 3) compare the motives of faculty who were interested vs. faculty who were not interested in participating in international activities; and 4) identify barriers to participation in international activities.

\textbf{Procedures}

A census of all College of Agriculture and Home Economics faculty was taken. A list of faculty was obtained from each department secretary by the researchers. The population included 125 teaching and research instructors and professors (full, associate, assistant, adjunct, and emeritus) who were currently affiliated with the College. The study used descriptive survey methodology. Variables measured by the intercampus mail questionnaire were (a) demographic variables,
Motive indicators included on the questionnaire were generated from Murray’s (1938) motivational framework. Two indicators were developed to measure each of the 18 motives. Each indicator had a five-point, Likert-type subscale. For example, achievement was measured with the following indicator: I am (5=extremely, 4=highly, 3=moderately, 2=slightly, or 1=not motivated) to participate in international activities: 1. To achieve advancement in my career 5 4 3 2 1 (circle your answer).

A follow-up qualitative question on motives to participate in international activities was also asked. Barriers to participation were listed in response to a qualitative question.

A panel of experts (three faculty with international experience, one statistician, and an administrator from the Center for International Programs) assessed the questionnaire for content and face validity. The instrument was field tested on faculty in another college. While the three questionnaires returned provided further information on clarity and validity, they were insufficient to assess reliability; therefore, the reliability assessment was conducted post hoc. Post hoc split half and Cronbach’s alpha reliability coefficients of .95 were determined for the index of motives for participating in international activities.

Data were collected during August-September 1994 following a modified Dillman procedure for mail questionnaire administration (1978). Incentives were sent with both mailings to increase response rate. A 80.8 percent response rate with a 75.2 percent usable rate (n=94) was obtained. To check for non-response bias, respondents of the first mailing (n=72) were compared with respondents to the second mailing (n=22) on gender, years on faculty, overall motivation index scores, and interest in international participation. As no significant difference was found, the results will be generalized to the whole population.

Objective 1 was analyzed using frequencies, percentages, means, and standard deviations. Objective 2 was analyzed by adding responses together for paired indicators for each motive and reporting means and standard deviations for each motive (scale = 2-10). Qualitative motive data were analyzed by categorizing responses (n=75) under one or more of Murray’s (1938) 18 motives. When motive fusion was discovered (n=3), the responses were listed under both motives. Objective 3 was analyzed by separating the respondents who answered Highly interested to the question ”How interested are you in participating in international activities as a faculty member of NMSU?” from those who answered either Moderately, Slightly, or Not interested, and comparing the responses motive by motive using the Kolmogorov-Smirnov two-sample test. Overall motivation between the two groups was compared using the Kolmogorov-Smirnov procedure for the summated motive index values. To keep the study-wise error rate below .05, a Bonferroni correction was used. Only groups differing on a motive at a 0.25 percent comparison-wise error rate were declared significantly different. The use of inferential statistics was based on the assumption that faculty in the census were representative of past and future faculty in the College (Oliver & Tlinkle, 1982). Objective 4 was analyzed by categorizing responses into one of 13 barrier categories. Motive fusion was observed in seven responses.
Results and Conclusions

Objective 1. Of the 94 respondents, 16 (18.4%) were female and 71 (81.6%) were male. Eighty-three reported a bachelor's degree, 79 reported a master's degree, and 86 reported a doctoral degree. Faculty spent 43.2 percent of their time on teaching, 4.6 percent on extension, 45.7 percent on research, and 6.3 percent on administrative duties. Seventy-seven (86.5%) faculty reported they were on a tenure track, while 12 (13.5%) reported they were not. Fifty-one (57.3%) faculty were tenured and 38 (42.7%) were not. One (1.1%) instructor, 29 (33.3%) assistant professors, 15 (17.2%) associate professors, and 42 (48.3%) full professors answered the survey. Respondent's length of employment with NMSU ranged from one month to 33.3 years, with a median of 7.3 years.

Table 1
Motives for Participation in International Activities

<table>
<thead>
<tr>
<th>Motive</th>
<th>n</th>
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<th>sd</th>
<th>Level of Motivation</th>
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</thead>
<tbody>
<tr>
<td>Cognizance</td>
<td>92</td>
<td>7.8</td>
<td>1.8</td>
<td>Highly motivated</td>
</tr>
<tr>
<td>Exposition</td>
<td>92</td>
<td>7.5</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Play</td>
<td>92</td>
<td>7.1</td>
<td>2.0</td>
<td>Moderately motivated</td>
</tr>
<tr>
<td>Nurturance</td>
<td>91</td>
<td>7.0</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Similance</td>
<td>92</td>
<td>7.0</td>
<td>2.3</td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
<td>92</td>
<td>6.9</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Affiliation</td>
<td>91</td>
<td>6.6</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>91</td>
<td>6.1</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Dominance</td>
<td>92</td>
<td>5.3</td>
<td>2.2</td>
<td>Slightly motivated</td>
</tr>
<tr>
<td>Acquisition</td>
<td>92</td>
<td>5.3</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Contrarience</td>
<td>92</td>
<td>4.9</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Conservance</td>
<td>91</td>
<td>4.5</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Autonomy</td>
<td>92</td>
<td>4.4</td>
<td>2.2</td>
<td></td>
</tr>
<tr>
<td>Recognition</td>
<td>92</td>
<td>4.1</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Exhibition</td>
<td>91</td>
<td>3.8</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Deference</td>
<td>91</td>
<td>2.9</td>
<td>1.4</td>
<td>Not motivated</td>
</tr>
<tr>
<td>Infavoidance</td>
<td>92</td>
<td>2.7</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Blamavoidance</td>
<td>92</td>
<td>2.7</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>92</td>
<td>96.4</td>
<td>24.0</td>
<td></td>
</tr>
</tbody>
</table>

Objective 2. The researchers looked for natural breaks in the means of motive responses to assign level of motivation descriptors ranging from "not motivated" to "highly motivated" (Table 1). Respondents were highly motivated by cognizance ($\bar{x}$=7.8) and exposition ($\bar{x}$=7.5) and moderately motivated by play ($\bar{x}$=7.1), nurturance ($\bar{x}$=7.0), similance ($\bar{x}$=7.0), achievement ($\bar{x}$=6.9), affiliation ($\bar{x}$=6.6), and construction ($\bar{x}$=6.1).
From the 94 usable questionnaires returned, there were 75 separate qualitative responses to the open-ended motive question. Some participants did not respond to this question, while others wrote several comments. Cognizance again surfaced as the top motive for participation (n=37). Other motives with frequencies over five were affiliation (n=10), achievement (n=6), and conservance (n=5) (Table 2).

Objective 3. Forty-three (46.2%) faculty were highly interested in participating in international activities as a faculty member and 50 (53.8%) were either moderately, slightly, or not interested in participating in international activities in the future. The top seven motives for faculty who were highly interested were cognizance ($\bar{x}=8.98$), exposition ($\bar{x}=8.33$), similance ($\bar{x}=8.30$), play ($\bar{x}=8.14$), achievement ($\bar{x}=7.95$), nurturance ($\bar{x}=7.91$), and affiliation ($\bar{x}=7.50$). For faculty who were less than highly interested to participate, the top seven motives were cognizance ($\bar{x}=6.81$), exposition ($\bar{x}=6.70$), play ($\bar{x}=6.27$), nurturance ($\bar{x}=6.15$), achievement ($\bar{x}=5.94$), similance ($\bar{x}=5.92$), and contrarience ($\bar{x}=5.86$). Highly motivated faculty were significantly different from less-than-highly motivated faculty on these seven motives and on the overall scale (Table 3).

Objective 4. Of the 94 usable questionnaires returned, there were 157 separate barrier responses. Motive fusion was observed in seven responses, thus they were listed twice (n=164), (Table 4). Barriers cited over 10 times were lack of time (n=36), lack of reward (n=32), lack of logistical support (n=18), lack of funding (n=16), lack of language skills (n=15), family concerns (n=14), and lack of perceived opportunity (n=13).

The following conclusions were drawn: (1) Faculty spend the majority of their time on teaching and research activities, and most faculty are on a tenure track. Over half the faculty are tenured. (2) Faculty are highly motivated to participate in international activities by intrinsic motives such as cognizance, exposition, play, nurturance, similance, achievement, affiliation, and construction. Motives of lesser importance were extrinsic in nature such as recognition, exhibition, infavoidance, and blamavoidance. (3) Faculty who were highly interested were significantly different from those who were less than highly interested on these seven motives: cognizance, similance, play, achievement, nurturance, affiliation and contrarience and on overall motivation. (4) In contrast to the importance of intrinsic motives found in Objectives 2 and 3, commonly cited barriers to participation were mostly extrinsic in nature, including lack of time and reward.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Qualitative Responses-Motives for Participating in International Activities</th>
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<tbody>
<tr>
<td>Motive</td>
<td>Frequency</td>
</tr>
<tr>
<td>Cognizance</td>
<td>37</td>
</tr>
<tr>
<td>Affiliation</td>
<td>10</td>
</tr>
<tr>
<td>Achievement</td>
<td>6</td>
</tr>
<tr>
<td>Conservance</td>
<td>5</td>
</tr>
<tr>
<td>Other motives</td>
<td>15</td>
</tr>
<tr>
<td>Items listed under motive but a barrier</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
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Table 3
Motive Comparison Between Highly Interested and Those Less Than Highly Interested in Participating in International Activities

<table>
<thead>
<tr>
<th>Motive</th>
<th>Interest</th>
<th>n</th>
<th>(z)</th>
<th>sd</th>
<th>D*</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognizance</td>
<td>High</td>
<td>43</td>
<td>8.98</td>
<td>1.12</td>
<td>.5319</td>
<td>.0001**</td>
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<tr>
<td></td>
<td>Less than high</td>
<td>48</td>
<td>6.81</td>
<td>1.73</td>
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<td></td>
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<td>Exposition</td>
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<td>1.47</td>
<td>.2839</td>
<td>.0516</td>
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<tr>
<td></td>
<td>Less than high</td>
<td>48</td>
<td>6.70</td>
<td>2.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Similance</td>
<td>High</td>
<td>43</td>
<td>8.30</td>
<td>1.81</td>
<td>.4966</td>
<td>.0001**</td>
</tr>
<tr>
<td></td>
<td>Less than high</td>
<td>48</td>
<td>5.92</td>
<td>2.10</td>
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<td></td>
</tr>
<tr>
<td>Play</td>
<td>High</td>
<td>43</td>
<td>8.14</td>
<td>1.86</td>
<td>.4026</td>
<td>.0013**</td>
</tr>
<tr>
<td></td>
<td>Less than high</td>
<td>48</td>
<td>6.27</td>
<td>1.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
<td>High</td>
<td>43</td>
<td>7.95</td>
<td>1.43</td>
<td>.4598</td>
<td>.0001**</td>
</tr>
<tr>
<td></td>
<td>Less than high</td>
<td>48</td>
<td>5.94</td>
<td>1.78</td>
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<tr>
<td>Nurturance</td>
<td>High</td>
<td>43</td>
<td>7.91</td>
<td>1.63</td>
<td>.3958</td>
<td>.0018**</td>
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<tr>
<td></td>
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<td>48</td>
<td>6.15</td>
<td>1.76</td>
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<tr>
<td>Affiliation</td>
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<td>7.50</td>
<td>1.71</td>
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<td>.0006**</td>
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<tr>
<td></td>
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<td>48</td>
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<td>1.74</td>
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<td></td>
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<td>Construction</td>
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<td>7.00</td>
<td>2.06</td>
<td>.3720</td>
<td>.0041</td>
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<td>48</td>
<td>5.29</td>
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<td></td>
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<tr>
<td>Dominance</td>
<td>High</td>
<td>43</td>
<td>6.16</td>
<td>2.07</td>
<td>.3028</td>
<td>.0312</td>
</tr>
<tr>
<td></td>
<td>Less than high</td>
<td>48</td>
<td>4.54</td>
<td>2.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquisition</td>
<td>High</td>
<td>43</td>
<td>6.09</td>
<td>2.70</td>
<td>.3202</td>
<td>.0191</td>
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<tr>
<td></td>
<td>Less than high</td>
<td>48</td>
<td>4.58</td>
<td>2.21</td>
<td></td>
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<td>Contrarien</td>
<td>High</td>
<td>43</td>
<td>5.86</td>
<td>2.28</td>
<td>.4195</td>
<td>.0007**</td>
</tr>
<tr>
<td></td>
<td>Less than high</td>
<td>48</td>
<td>4.00</td>
<td>1.72</td>
<td></td>
<td></td>
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<tr>
<td>Autonomy</td>
<td>High</td>
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<td>2.45</td>
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<td>.0128</td>
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<td>48</td>
<td>3.77</td>
<td>1.78</td>
<td></td>
<td></td>
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<tr>
<td>Recognition</td>
<td>High</td>
<td>43</td>
<td>4.79</td>
<td>2.23</td>
<td>.3716</td>
<td>.0038</td>
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<tr>
<td></td>
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<td>48</td>
<td>3.46</td>
<td>1.74</td>
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<td>4.33</td>
<td>1.60</td>
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<td>Exhibition</td>
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<td>.1294</td>
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<td>2.98</td>
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<td>Infavoidance</td>
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<td>2.79</td>
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<td>48</td>
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<td>1.16</td>
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<td>Blamavoidance</td>
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<td>2.74</td>
<td>1.29</td>
<td>.0658</td>
<td>.9999</td>
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<tr>
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<td>48</td>
<td>2.63</td>
<td>1.23</td>
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<tr>
<td>Totals</td>
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<td>48</td>
<td>85.21</td>
<td>21.72</td>
<td></td>
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</table>

Note. *Kolmogorov-Smirnov 2-sample test statistic.
Note. **Significantly different at the .0025 probability level.
Table 4  
Barriers to Faculty Participation in International Activities  

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Frequency</th>
<th>% (n=164)</th>
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</thead>
<tbody>
<tr>
<td>Lack of time</td>
<td>36</td>
<td>22.0</td>
</tr>
<tr>
<td>Lack of reward</td>
<td>32</td>
<td>19.5</td>
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<tr>
<td>Lack of logistical support</td>
<td>18</td>
<td>11.0</td>
</tr>
<tr>
<td>Lack of funding</td>
<td>16</td>
<td>9.7</td>
</tr>
<tr>
<td>Lack of language skills</td>
<td>15</td>
<td>9.1</td>
</tr>
<tr>
<td>Family concerns</td>
<td>14</td>
<td>8.5</td>
</tr>
<tr>
<td>Lack of perceived opportunity</td>
<td>13</td>
<td>7.9</td>
</tr>
<tr>
<td>Fear of leaving current research</td>
<td>7</td>
<td>4.3</td>
</tr>
<tr>
<td>Felt need to work domestically</td>
<td>4</td>
<td>2.4</td>
</tr>
<tr>
<td>Do not enjoy travel</td>
<td>4</td>
<td>2.4</td>
</tr>
<tr>
<td>Gender</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Anti-Mexican attitude</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Safety</td>
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<td>.6</td>
</tr>
<tr>
<td>Total</td>
<td>164</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Significance of the Study**

The study found that important motives for participating in international activities were cognizance, exposition, play, nurturance, similance, achievement, and affiliation. Faculty who are highly interested in participating in international activities are more motivated to learn, teach, achieve, help others, and be with people. These motives are generally intrinsic in nature. Barriers to participation in international activities were generally extrinsic in nature. Barriers like lack of reward, logistical support, funding, and language skills were consistent with the findings of Jones & Crawford (1985), Management Analysis Center, Inc. (1982), Perez & Rogers (1984), and Whitaker (1980).

In the opinion of the researchers, efforts to increase international activities among faculty should concentrate on satisfying motives and reducing barriers. The data suggest that efforts to increase international activity should focus on providing faculty with fulfilling and enjoyable learning experiences with opportunities to make a positive difference for people through teaching and/or development work. When considering barriers (e.g., lack of time, reward, logistical support, funding, or language skills, and family concerns), high-impact, short-term (less than one month) international activities would appear to be ideal. Such activities should be preceded by language training when necessary. Administrators need to provide logistical support, funding, and recognition for their faculty to remove barriers.

Further research should be considered to determine relationships between tenure and motivation for participating in international work, and between tenure and the level of interest in international work. The relationship between interest and motivation to participate should be explored in other colleges of agriculture and home economics nationwide. A study of how faculty conceptualize "international activity" should also be conducted.

College of Agriculture and Home Economics (1992, June). Guidelines for tenure and promotion of resident instruction/experiment station faculty. New Mexico State University.


Huntsberger, P. E. (1992). Strengthening the international dimension: International goals for New Mexico State University. New Mexico State University, Center for International Programs, Las Cruces.


School of Agriculture Internationalization Committee. Draft final report. (1990, March). Purdue University, College of Agriculture.


"THIRD WORLD" WOMEN AND THE ENVIRONMENT: A FORMULA FOR SUSTAINABLE DEVELOPMENT?

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The Pennsylvania State University
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Outstanding Graduate Student Research Presentation

This paper is the outstanding graduate student research paper from the Eleventh Annual Meeting of the Association for International Agricultural and Extension Education, Little Rock, Arkansas, U.S.A., March 23, 24 & 25, 1995.

Abstract

Agricultural development has contributed not only to increased global food supplies, but to environmental degradation and the marginalization of women. This may be traced back to how agricultural science is practiced, its philosophical and economic underpinnings, and how and to whom we as agricultural extension professionals chose to disseminate agricultural knowledge and innovations. This paper primarily addresses why women must be included in agricultural development initiatives in "developing" countries. In this philosophical and issue-based paper, I explore the following questions: How has economic development impacted women? What is sustainable development and how can something that has historically and by its very nature been destructive to the environment, simultaneously sustain it? How can international extension initiatives enhance and ensure agricultural and environmental sustainability? I conclude with a call for an agricultural extension system that is gender sensitive and responsive to women farmer's primary role as global food producers.

Introduction

Men have pretended for too long that they can conquer nature; women can show them how to conquer the future by placing their decisions and activities within the context of what nature can tolerate.

This means no longer confusing needs and wants. What people need, the environment was designed to provide. What people want may put us all under the sentence of death (Martin-Brown 1992, p. 26).

Adhiambo Nyakiamo: A Woman's Story

It is 4:30 A.M. Thirty-five year old Adhiambo Nyakiamo nurses her one-month old baby before she takes up her short handled hoe or jembe and goes to the shamba to dig. It takes Adhiambo, with the infant riding securely on her back, about fifteen minutes to walk to her small plot of sweet potatoes, beans, tomatoes, and onions. Cultivating with the jembe is strenuous work and sweat runs down her arms and legs.

At 6:00 A.M. Adhiambo adjusts the baby on her back, and walks quickly to the nearby community well. She'll need water for the day's cooking and washing and is thankful that the new UNICEF borehole is close to her home.
Before installation of the well, Adhiambo walked three miles every day to fetch water from a small, unclean waterhole. During the dry season, when the waterhole dried up, she had to walk even farther. Adhiambo fills her ten gallon jerry can, balances it on her head, makes sure the baby is secure on her back, picks up the basket of freshly picked tomatoes, and walks the half mile home. After feeding the chickens and pig, Adhiambo prepares a simple breakfast of tea and sweet bananas for her three school-age children and the two-year-old toddler, Ben. The two boys attend the local church school but Joy, also of school-age, must stay home and tend the baby and Ben.

Adhiambo returns to the shamba to weed and cultivate the family maize plot before the day gets too hot. As she works, Adhiambo wonders how she can acquire much needed fertilizers and seeds. She cannot qualify for a loan because she has no collateral. The local agricultural extension officer, who sometimes provides agricultural inputs at reduced prices, has not visited the area for months. Even if he came to Bomet, he would not visit the farm without her husband present. Julius, Adhiambo's husband, has gone to Nairobi in search of work. She has not seen him in ten months, and the promised shillings for school fees and staples have not materialized. It is increasingly difficult for Adhiambo to purchase cooking oil, tea, and sugar for her family.

After lunch, a cup of "dry" tea (no sugar and milk again!), Adhiambo prepares a cement-like mixture of red soil (gathered from a termite mound), cow manure, and wood ash to smear on the walls of the small, one room house. This must be done before the second rains arrive. As she works, Adhiambo worries about the baby. The local health aid post is sponsoring a Well Baby Clinic today but she doesn't have the time or energy to walk the five miles to the aid post. Perhaps when the next Clinic is scheduled, the baby can be weighed and immunized; and perhaps she'll talk to the nurse-in-charge about family planning. Five children are just too many. But then another little girl like Joy, to help with the never-ending work, would be a blessing.

By 4:00 P.M. the boys are home from school and Adhiambo sends them to fetch water while she begins the seemingly endless task of cooking food over a small, open fire. The family eats posho (maize porridge) and beans daily. You would think with all her experience in cooking posho and beans, the time involved in preparing these staple foods would have lessened! It has not. As she places a handful of twigs on the cooking fire, Adhiambo observes that tomorrow she must gather firewood. She remembers how easy it was as a girl to find fuel, but now the task takes a whole day. The trees are becoming fewer and fewer. Adhiambo wishes that she had one of those new fuel efficient lorena stoves to cook on, but she has been unable to afford the time or the bus ticket to travel to the agricultural extension rural training center where stove construction is taught. Besides, who would care for the children and the shamba?

Around 7:00 P.M., Adhiambo prepares a medicinal tea made from local herbs and wraps some food in banana leaves to take to Akinyi, her husband's ailing second wife. She gives the woman a few precious shillings before leaving. At home, the boys are finishing their homework by the light of a candle. Kerosene is too expensive to buy. Adhiambo, like most of the women in her village, is illiterate. She hopes that education will lift her children out of poverty. For the boys, that may be so, but young Joy has already joined the cycle of poverty that her grandmother and mother entered as girls.

It has been a long, arduous day . . . but then, everyday is. Adhiambo stretches out exhausted on her woven mat, already planning the next day's activities: digging in the shamba, fetching water, pounding millet, selling her tomatoes at the weekly market, gathering firewood, washing clothes, so much to do. Her final thought, as she drifts off to sleep, is of a place where food is plenty, water clean, children healthy, and women are never tired.

**Purpose**
This paper examines women's traditional roles as stewards of the environment and the effects of economic development on those roles. It specifically addresses the idea of sustainable development and women's contribution to it. Questions posed include: How has economic development impacted women? What is sustainable development and how can something that has historically and by its very nature been destructive to the environment, simultaneously sustain it? Is agricultural development and environmental sustainability compatible? How can international extension initiatives enhance and ensure agricultural as well as environmental sustainability?

**Methodology**

This paper is philosophical and issue-based. Using a feminist theoretical framework, I synthesize relevant publications, case studies, and my personal and professional experiences as a development practitioner in East Africa and Southeast Asia to address the theme of women as a formula for sustainable development.

**Women As Traditional Resource Managers**

Women's work has always been close to and dependent upon nature. In primitive hunter-gatherer societies, women collected seeds, nuts, berries, and roots to feed their families. An intimate knowledge of nature was essential to survival. Huston (1992, p. 14) writes that this remains true today. "Women know intuitively that a society which turns its back on Nature is doomed." Women in subsistence economies are the unacknowledged experts on the use and management of the environment. They know the importance of forests to life, appreciate clean, plentiful water, and do not take for granted the many gifts of nature. For cash and resource poor "Third World" women, a healthy environment insures the survival of their families. According to Jacobson (1992, p. 27), "forests and other land resources are to women in the Third World what grocery stores and utilities are to most women in industrialized nations." Like Adhiambo Nyakiamo, women worldwide depend on nature's resources for life's basics. Forests and woodland, for example, are a major source of fuel for "Third World" homes. Without wood, women could not cook food, boil water or heat their homes. It's not unusual in rural Africa for women and girls to gather 60 to 80 percent of all the fuel that their families need. Huston observes (1992, p. 17) "that while millions of women walk for hours every day in search of a few twigs with which to cook a single meagre meal, others open cans of chemical-laden foods and cook them in microwave ovens." Such are the paradoxes of our unequal world. Women also depend on forests for medicinal plants, herbs, and fiber. Finally they know that a healthy forest means a plentiful water supply.

"Third World" women's unique environmental stewardship revolves around a complex indigenous knowledge system. According to Chambers (1983, p. 84): "Rural people's knowledge, and especially indigenous knowledge systems, have many dimensions, including linguistics, medicine, clinical psychology, botany, zoology, ethnology, ecology, climate, agriculture, animal husbandry, and craft skills." Traditional agricultural practices and knowledge of the environment are particularly noteworthy. Jacobson (1992, p. 30) continues that "beyond their experience at managing forests, women's knowledge of forest resources is vast. Tribal women in India, for example, know of medicinal uses for some 300 forest species. A survey in Sierra Leone found that women could name 31 products they gathered or made from nearby trees and bushes, while men could name only 8." Finally, according to research conducted on common lands by Babjik Kudar, director of the Indian State Common Lands College, women are more effective at protecting and regenerating the environment than either state or private land owners. Kudar states that the reason is obvious. "When you depend on something, you learn to take care of it" (Jacobson, 1992, p. 30).

**Women and Economic Development**

Since the 1940s, billions of dollars have been spent on development projects in the "Third
World." Bilateral and multilateral development assistance agencies such as the United States Agency for International Development, the World Bank, and the United Nations Development Programme have funded infrastructure projects such as the building of roads, dams, and power plants . . . all in the name of economic development and many times at great cost to the environment. Unfortunately, according to Jacobson (1988, p. 35) and other critics of large-scale economic development programs, "development assistance has failed to achieve two fundamental goals: improved equity and increased economic opportunities for the poor." More shocking, of the nearly one billion people who have remained untouched by global economic progress, the vast majority are women. Part of the problem is that women and their concerns are too often excluded as a factor in development planning. In addition, research shows that women's economic and social position has actually worsened with "development."

A United Nations document states that while women represent over 50 percent of the world's population, they perform nearly two-thirds of all working hours, receive only one-tenth of the world income and own less than 1 percent of world property (Staudt, 1991, p. 49). Economic development threatens that tiny percent of property owned by women by encouraging privatization of land (which generally places land titles in the hands of males); and subsidization of large-scale cash and mono-cropping schemes (also male controlled) that push women off their already small land-holdings. This undermines women-controlled subsistence agriculture and destroys the resource base that they depend on for survival. Shiva (1989, p. 12) adds that "the destruction of ecologically sound traditional technologies often created and used by women, along with their material base is generally believed to be responsible for the 'feminization' of poverty."

**Sustainable Development: Hope or Hype?**

Over the past ten years, there have been positive changes in the planning and implementation of economic development programs. The international women's movement has done much to sensitize development assistance agencies to the concerns and needs of women, the 1973 Percy Amendment placed Women in Development on the law books, and grassroots women's groups are blossoming worldwide. The role of women has been recognized as central to the development process, and policy makers and development planners have begun to focus on the need to help women work more efficiently and productively. Another hopeful sign for women is operationalization of a relatively new term but an old idea . . . sustainable development.

Some may argue that sustainable development is an oxymoron. How can something, that has historically and by its very nature been destructive to the environment, simultaneously sustain it? It is a good question. Development is not an easy word to define. In a group of 100 people one could easily get just as many definitions, especially if the room where filled with World Bank economists, USAID technocrats, Non-Governmental Organization development practitioners, missionaries, government politicians and, hopefully, "Third World" women. According to Adams (1990, p. 4), "this (development) is a semantic, political and indeed moral minefield."

The International Union for the Conservation of Nature (IUCN) attempts some reconciliation between economic and sustainable development by defining development as "the modification of the biosphere and the application of human, financial, and living and non-living resources to satisfy human needs and improve the quality of human life" (Adams, 1990, p. 49). Redclift (1992, p. 27) adds an economist's twist, describing sustainable economic development as "the optimal level of interaction between three systems -- biological, economic and social -- to maximize the net benefits of economic development, subject to maintaining the services and quality of natural resources over time." The term "sustainable development" was brought into common use by the 1987 World Commission on
Environment and Development or the Brundtland Commission. The Brundtland Commission defines sustainable development as "meeting the needs of the present without compromising the needs of future generations" (World Bank, 1992, p. 8). Adams (1990, p. 8) concludes that "it is indeed only rarely and recently that environment and development have been linked theoretically with any kind of success. This has been done by arguing the need to set environmental resources and resource use in a social and political as well as economic context."

It is very easy to get caught up in the rhetoric and "isms" of the debate over sustainable development. As Adams (1990, p. 2) says, "it has become the new jargon phrase in the development business." Sustainable development is not a new concept to "Third World" women. They have been practicing it for centuries, though their traditional resource management skills are only now being recognized as such. Today, women's roles as resource managers and sustainers of the environment are demonstrated by projects scattered throughout the developing as well as developed world. Two such projects, Vasanth Kanibera in India's Andhra Pradesh state and the Green Belt Movement of Kenya, are worth mentioning as examples of grassroots sustainable development efforts.

Vasanth Kanibera is a village-level women's organization formed in response to severe land degradation in their area. The degradation of once productive land had led to the erosion of topsoil and the clogging of water drainage systems, causing salinity, loss of crops and increasing unemployment. A group of local women qualified for a loan from a development society in order to lease degraded land near their village. They revived the land by using traditional farming methods instead of heavily-subsidized, market-oriented, mono-crop agriculture. Techniques utilized insured that there was no further loss of topsoil, crop diversity, or wasted rainwater. Vasanth Kanibera eventually involved 400 women in twenty villages. In three years, 700 acres of otherwise useless land was restored to productive use. The program and techniques of Vasanth Kanibera are now being used across the whole of Andhra Pradesh (Martin-Brown, 1992).

The Green Belt Movement was launched in 1977 under the auspices of the National Council of Women of Kenya (NCWK), with the charismatic leadership of Professor Wangari Maathai. It is a grassroots struggle against desertification, deforestation, soil loss, fuelwood scarcity, and decreasing water supplies. Along with these objectives, the Green Belt Movement is committed to increasing public awareness of the relationship between environmental degradation and such issues as poverty, unemployment, malnutrition, and the mismanagement of natural resources. The idea for the Green Belt Movement grew out of Professor Maathai's desire to solve two interrelated problems facing her country: chronic unemployment and environmental degradation. Maathai saw the need to educate people at the grassroots level to help them understand that some of their activities -- such as overgrazing and cutting down trees -- were partly responsible for their problems. The result is a nation-wide network of tree nurseries, run mostly by local women, and village woodlots, tended primarily by women, children and the handicapped. Trees are being planted by the millions, producing firewood, animal fodder, enriched soil, and natural beauty. Innumerable women have gained not only additional cash income, but training in resource and financial management, community leadership skills, self-confidence, and respect (Maathai, 1992). Professor Maathai concludes that "the aims of the Green Belt Movement are inspired by the needs and problems of Kenya" (p. 25).

Approximately, four years ago, the Movement launched an All-Africa Green Belt Movement Network in eastern and southern Africa. "Our objectives are valid for many other countries, not only in Africa but elsewhere in the world" (Maathai, 1992, p. 25).

Finally, unchecked population growth is a major stress on the environment, putting demands on
fragile ecosystems as well as the rural women who manage them. It is estimated that 300 million women currently do not have access to safe and affordable family planning. A United Nations survey reveals if those women who said they wanted no more children were given that option, the number of births would drop by 27 percent in Africa, 33 percent in Asia, and 35 percent in Latin America (Stranahan, 1993). Stranahan concludes that "when women in poor countries get a voice in the basic decisions affecting their lives, birth rates usually drop, threats to the environment decrease and quality of life improves for everyone" (p. 3).

Women, Agricultural Extension, and Sustainable Development

What does the environment, sustainable development, and women have to do with international agricultural extension? Agricultural development, though well-meaning, has contributed to environmental degradation and marginalization of women. This may in part be traced back to how agricultural science is practiced, its philosophical and economic underpinnings, and how and to whom we as agricultural extension professionals chose to disseminate agricultural knowledge and innovations. The feminist critique of science provides insight into these issues.

The Feminist Critique of Science

Feminist scholars and theorists have observed that science is dominated by men. In this domination has developed, what Eichler called, "sexist science." According to Eichler (1980), sexist science is characterized by the following aspects:

1. Women are to a large degree ignored, yet conclusions and theories are phrased in such general terms that they purport to be applicable to all of humanity.

2. If women are considered, they tend to be considered only in so far as they are important for and related to men, not by virtue of their own importance as human subjects.

3. Where both sexes are considered, the male is generally taken as the norm, the female is the deviation from the norm.

4. Sexist content is mirrored in sexist language, as reflected, for instance, in the use of the generic he and the generic man.

5. Sexist science is full of preconceived notions concerning a masculine and feminine nature. Consequently, identical behaviors or situations involving women and men are described and analyzed differently according to sex. In other words, we find a consistent double standard with sexist science.

6. By using sexist notions of human nature, and employing a double standard in interpreting findings, sexist science itself becomes one contributing factor in the maintenance of the sex structure from which it arose in the first place and in which it is grounded. (p. 118-119)

Harding (1991a; 1991b) takes Eichler's critique a step further by including "Third World" women. She is particularly concerned with the racism of science and technology, and the implications of racism on "Third World" women. In particular, Harding challenges science's participation in assigning sexualized meanings to nature and "scientific" inquiry, and the ways in which racism and sexism have legitimized exploitation and domination of women and the environment.

Finally, the literature on women and development is full of examples of technology transfers that are economically and politically advantageous to the West, but further deteriorate the material and social resources of women and men in "developing" countries (Harding, 1991a). One of the most dramatic instances of women's suffering from "modernization" was/is the Green Revolution. In this example, introduction of High Yielding Varieties encouraged production of cash crops for export thus, displacing women's
subsistence agriculture. This resulted in a drop in women's (and their families) economic and subsequently nutritional well-being. The point is that much technology (until very recently) introduced into the "Third World", has primarily been developed by men for men.

**Agricultural Research and "Third World" Women**

Agricultural research is concerned with the development of new agricultural technologies such as improved seeds, fertilizers, and cultivation techniques. Yapa (1993) referred to agricultural modernization as a model of 'scientific agriculture.' Agricultural extension, the educational arm of agricultural research, is dependent on research to produce technology and innovations -- thus making agricultural science and extension a direct descendent of the Enlightenment (and susceptible to Science's masculinist biases!).

Before continuing with this discussion, it is helpful to look at the arenas or institutions where agricultural knowledge is generated and technologies developed. According to Oasa and Jennings (1994), science-based technology represents the foundation of the dominant strategy to alleviate 'the food problem' in the "developing" world. Technology such as high-yielding cereal grains have been developed by international research centers, most notably the International Rice Research Institute (IRRI) in the Philippines and the International Maize and Wheat Improvement Center (CIMMYT) in Mexico. These institutions and their strategies have been criticized for benefiting mainly those farmers (generally not women) with access to adequate irrigation facilities, fertile soil, and credit for seeds, machinery, and chemical inputs. Agricultural scientists not only excelled at making agriculture more productive, but "productivity" became the dominant ideology in agricultural science.

Additionally, much international agricultural research is done in the United States Land-Grant and agricultural universities, The Pennsylvania State University being one such institution. A "feminist reading" of the Penn State College of Agricultural Sciences Staff Directory (1993-94) indicates that out of 413 College of Agricultural Sciences faculty members, 363 (87.9%) are male and only 50 (12.0%) are female. Of the 152 full professors in the College, 148 (97.4%) are male and 4 (2.6%) are female. It is interesting to speculate on what those demographics mean in terms of feminist or women-focused research agendas in the agricultural sciences?

According to Jiggins (1984a, p. 168), "... sections of (World Bank) reports on agricultural research point out that research on traditional or other food crops has been neglected in favour of cash crop research." Traditional or subsistence food crops have traditionally been the domain of women, and cash crops of men. She continues that what is appropriate to the circumstances of male agricultural management will not necessarily be appropriate to female agricultural management. Jiggins (1984b, p. 231) concludes that "it is remarkable . . . how few of the international and national agricultural research institutes (or their support service, ISNAR), which are running farming or cropping systems research programmes have thought fit to include women in their research teams . . . it seems that, unless pressed by women colleagues, men of science, no less than managers and administrators, allow WiD issues to assume low priority."

**International Agricultural Extension and Environmental Sustainability**

The discourse of international agricultural extension is linked with the discourse of science, development of technology, and transfer of technology. The purpose and quality of agricultural technologies directly affects the lives of "Third World" women as well as the quality of our environment. As previously stated, women are rarely consulted when it comes to the design of a new agricultural method or gadget. In addition, gender bias in international agricultural extension is not unusual. The International Directory of National Extension Systems...
explicitly documents the pervasiveness of the male bias in agricultural extension (Jiggins, 1984a). According to a 1970s baseline study, USAID women-focused agricultural projects in Africa comprised less than 10 percent of total projects in the region. Future projections for the 1980s and beyond dropped to 9 percent (Gladwin et al., 1984). "The point that needs to be stressed is that the questions of women's access to extension is not simply a matter of the sex of the extension worker, nor of whether access is nominally non-discriminatory. The practical implications of extension approach, design, field behaviour and institutional structures are equally, if not more, important . . ." (Jiggins, 1984a, p. 170).

By paying heed to the feminist critique of science, encouraging healthy questioning of international agricultural extension objectives and strategies, disseminating gender-sensitive sustainable agricultural practices, and recognizing women's unique, historical role as stewards of the environment, international extension can make a substantial contribution towards global sustainability. Specifically, recognizing the Eurocentric male biases of "science as usual" may allow for design of women-focused (or at least people-centered) research agendas in the agricultural sciences. Technology will not be developed primarily by men for men with the assumption that benefits will "trickle-over" to women and their dependents. Addressing the pluralistic nature of "Third World" women -- in fact all women -- can facilitate the development of culture-specific technologies and programs designed to meet their needs. Considering the question of who creates knowledge and who owns knowledge -- especially in terms of indigenous technical knowledge -- will foster awareness and respect of the complexity and rationality of rural peoples' (particularly women's) knowledge. As Chambers (1983, p. 85) observed, "Many of the practices of small farmers which were once regarded as primitive or misguided are now recognized as sophisticated and appropriate." Finally, recognizing the tendency to essentialize masculine and feminine roles will encourage researchers and program planners to more realistically address problems in both women's and men's lives. Women will receive plows as well as cooking pots.

Sauer (1990) concludes: The problems of the future in agriculture . . . cannot be solved by the research and extension programs of the past. We need major changes in the research agenda, in the organization and funding of research and extension programs, and in the mix of scientists and educators who will carry out these changes. Research and extension will be driven by new priorities: sustainability, environmental quality, human health, consumer preference, and the well-being of rural communities and society as a whole, as well as the traditional priority of productivity. Addressing these concerns will involve ethical considerations and will require that societal values be incorporated into decisions about research and the development and transfer of technology. (pp. 186-187)

I might add, along with overall gender considerations, these concerns must specifically involve women and their many times overlooked contributions. Feminist theory and discourse can be a very positive force in guiding the future of international extension.

Conclusions

Adams (1990, Table 3.4) outlines the following requirements of a strategy for sustainable and environmentally sound development:

1. A political system that secures effective citizen participation in decision making.

2. An economic system that is able to generate surpluses and technical knowledge on a self-reliant and self-sustained basis.

3. A social system that provides for solutions for the tensions arising from disharmonious development.

4. A production system that respects the obligation to preserve the ecological basis for
development.

5. A technological system that can search continuously for new solutions.

6. An international system that fosters sustainable patterns of trade and finance.

7. An administrative system that is flexible and has the capacity for self-correction. (p. 61)

I would add two more strategies to Adams' list: an agricultural extension system that is gender sensitive and responsive to women farmers' primary role as global food producers; and a gender system that insures equity for both women and men. As Abzug (1992, p. 36) candidly said, "women must be more than global housekeepers, and until they are treated equally with men, nothing will change."

"Human beings, in their quest for economic development and enjoyment of the riches of nature, must come to terms with the reality of resource limitation and the carrying capacities of the ecosystem" (Adams, 1990, p. 47). The evidence is overwhelming that women, with their intuition and intimate knowledge of the environment, are already prime actors in sustainable development. Extension practitioners would be remiss to ignore this fact. I, along with many others, believe that there can be no sustainable development for anyone without development for women; and if a model for sustainable development is to succeed "formally", women must be included in all levels of development policy formulation, program design, and project implementation. In addition, agriculture is intimately linked to the environment -- "Third World" women and agriculture are inseparable. International extension scholars, educators, and practitioners have the unique opportunity to influence sustainable development and ultimately the survival of the planet. They can, no they must, be instrumental in achieving this goal.

**Epilogue**

The morning comes quickly for Adhiambo Nyakiamo. While nursing the baby, she remembers that today Wangari Maathai and some representatives from the Ministry of Agriculture are coming from Nairobi to talk to the local women about tree nurseries and community woodlots. Imagine somebody coming all the way to Bomet to talk to women! They say that growing trees will make it easier to collect firewood and the seedlings can be sold to earn extra money. What a wonderful idea! Adhiambo reconsiders what she has to do for the day, and decides that her chores can be put off for a few hours. It would be so nice to sit with other women under a big mango tree, drink tea, talk, and rest.
Bibliography


THE EMERGING ROLES OF THE UNIVERSITIES AND COLLEGES IN AGRICULTURAL EXTENSION AND RURAL DEVELOPMENT IN CHINA

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Introduction

Agricultural education, research and Extension are facing great challenges in terms of democracy, decentralization, and the issues of population, resources and environment in nearly all countries. It is especially the case in the Peoples Republic of China (PRC) where the centralized planning economy is being replaced by a market economy after 15 years of reform efforts. This paper attempts to illustrate the emerging role of agricultural universities and colleges in the national efforts for agricultural Extension and rural development in China.

After briefly reviewing the historical evolution of agricultural Extension in China, the authors provide information on changes since 1949. The developments are discussed in terms of the objectives of Extension, the institutional settings, the approaches followed, the main types of technologies disseminated and the consequences. These provide a background to understand the reasons for Chinese agricultural universities and colleges to develop their Extension functions.

Several approaches are described for the Extension activities of the universities and colleges. Finally, the endeavor of Beijing Agricultural University are introduced. The paper is concluded by providing some implications for the development of the Extension roles of Chinese universities and colleges.

Agricultural Extension in China: The Historical Evolution and Reform Since 1980

China, one of the earliest countries to develop agriculture in the world, has a very long history of agricultural Extension. Since the Zhou Dynasty (about 1100-841 B.C.) some officers specialized in agricultural administration and Extension. Named as "Quan Nong Guan (the Officer to encourage farming)" , they were assigned at all levels from the central down to local governments. According to historical records Emperor Han Wu Di of the Western Han Dynasty (206 B.C.- A.D. 24) gave an order to disseminate to the whole country the "Dai" land technology (an improved ridge farming method) and new farm implements developed or innovated by Zhao Guo, a high officer for agricultural administration at the time. In both the Southern and Northern Dynasties and Tang Dynasty some books on agricultural technology were published. Among them the most famous is the "Qi Min Yao Shu (Key Skills for the People or an Agricultural Encyclopedia)" written by Jia Sixie in 6th century A.D. In about the latter half of 10th century A.D., the Song Dynasty recruited "Nong Shi (agricultural teachers)" at the county level, who were not paid officers but Extensionists or farmer technicians living in the villages to advise farmers with technologies and improved varieties. The Chinese term "Tui Guang (Extension)" has been used in agriculture...
since the Song Dynasty. In the beginning of the 18th century contrast experiments and demonstration for improved varieties and double cropping of rice were implemented in south China (Yang Shimou 1987; S. Wittwer et al. 1987).

The institutionalized agricultural Extension has been developed since the turn of the 20th century. A first Extension organization for cotton production was set up in Jiangsu Province in 1924. After the issue of the first national regulation of Extension by the government in 1929, Extension organizations were established in 16 provinces. Agricultural experimental farms were set up at the central and provincial levels. Regulations of county agricultural Extension were issued in 1945 and then 586 county Extension stations were established in 17 provinces. There were 2,446 government agricultural Extensionists throughout the nation (396 at central level, 550 provincial and 1,500 county level) by the end of 1948. In addition, about 700 whole- and part-time Extension staff worked in public or private agricultural institutions (J. Delman 1991, Yang Shimou 1987).

The universities and colleges started their agricultural Extension activities in China during the 1920s'. The Jinling University and Southeast National University (now the Central University) in Jiangsu Province and Guangdong National University (now the Yet-Sun University) in Guangdong Province set up successively their own agricultural Extension sections in the period. The staff promoted the use of improved varieties and pest control, edited pamphlets for training, gave lectures and made demonstrations. Some of them were involved in the experimental campaign for rural community development run by non-governmental organizations in Hebei, Jiangsu, etc. Provinces in the 1930s' (Nie Chuang et al. 1993). University staff members who had graduated from U.S. institutions, tried to adopt the model of the land-grant university system for Extension activities. But the universities or colleges played only a limited role in the national agricultural Extension due to the war with Japan and the internal political revolution at that time.

Since the establishment of P.R.C. in 1949 agricultural Extension has evolved through four stages in terms of institutional changes: the establishment and development of agricultural Extension, 1949 - 1965; the development of four-level network for agricultural scientific experiments during the "cultural revolution", 1966 - 1977; the establishment of agricultural technological centers at different levels, 1978 - 1987; and the multi-sectoral and decentralized development of agricultural Extension, since 1988.

In 1952 the Ministry of Agriculture requested that agricultural Extension stations should be set up in every district (an administrative level between county and township at that time). The objectives for the Extension stations and the roles, functions and responsibilities of the Extensionists were further clarified in 1955 by the Ministry of Agriculture. By the end of 1956 there were 16,466 stations established and 94,219 staff recruited. On the average there was one station with five staff in each district except the remote mountainous areas (Yang Shimou 1987).

The main objective of the government for agricultural Extension in the 1950s was to achieve food security. In the beginning the main approaches were to summarize the experiences of the farmers, especially the model farmers, make adaptive experiments, demonstrations and disseminations. The technical contents of Extension in those years included local improved varieties, cultivation methods, fertilization and new farm implements. The package technologies for rice, wheat and maize were formed based on the farmers' experiences, including seed selection, use of improved varieties, rational dense planting, increase of fertilizer, nursery of strong seedlings, rational irrigation and pest control (Zhu Dehui et al. 1989). Walking plough, double-furrow plough and water-well saved the labor force greatly. The grain yield per ha. increased from 0.8 ton in 1949 up to 1.5 ton in 1957 according to the national statistics (Ma
After the 3-year natural disaster (1959 - 1961) an Extension campaign was executed throughout the whole country. Many agricultural researchers and about 70% of the Extension staff worked at the grassroots level. They made three kinds of combinations: 1) among leaders, farmers, scientists and technicians; 2) among experimentations, demonstrations and disseminations; and 3) among research, teaching and training. About one million farmer technicians came out in the whole country, organizing experimental groups in the villages (named brigade under the commune system at that time), producing seeds of improved varieties and planting model fields. Some of them learned the technical packages by which 7.5 tons of rice, 3.75 tons of wheat or 0.75 ton of cotton could be produced per ha (Yan Shimou 1987).

After adopting the Soviet Union's model, Chinese universities and colleges were entrusted only the tasks of education and limited roles in research. Their role in agricultural Extension was stopped in the early 1950s. According to the arrangements, research was mainly the responsibly of the academies and institutes while Extension was carried out by the government organizations. The university staff role in Extension was limited to only demonstrations or giving advice to the farmers nearby their experimental stations. The teachers and students were requested to go to the countryside in some years not for doing Extension or giving training but being laborers to get re-education.

After the beginning years of the fierce cultural revolution, started in 1966, a form of Extension system, the so-called "four-level agricultural scientific experimental network", was brought about in Huarong County, Hunan Province 1969. It consisted of agricultural scientific institutes at county level, agricultural scientific stations at commune (township at present) level, agricultural scientific teams at brigade (village at present) level, and agricultural scientific groups at production team (villager group at present) level. The government decided to promote this kind of institution throughout the whole country. About 1,140 counties had set up the institutes, 26,872 communes the stations, 332,233 brigades the teams and 224 million teams the groups by the end of 1975.

During the 10 years of cultural revolution the roles of science and scientists, including university teachers, were discriminated against. The approaches to Extension turned to more top-down by means of administrative instruments. The focus was still to increase the yield of stable food crops and meet the food security needs. Some of the results of the green revolution, such as improved varieties of wheat and rice, were introduced into China. The inputs of fertilizers and irrigation were increased accordingly. But the commune system destroyed completely the farmers' motivations in most of the areas. Crop yields still stagnated. More than 200 million rural population, about 25% of the total, were living under the poverty line by the end of the revolution.

Since the end of the cultural revolution the government has reemphasized agricultural education, research and Extension. Since the end of the 1970s, along with the political and economic reform, the agricultural Extension system was changed. The institutional structures changed greatly in rural areas. The commune system was replaced by the farm household responsibility system. The individual farmers became the decision-makers to use the land, allocate their resources and distribute the incomes. The brigades and production teams were disintegrated. So the former four-level network for Extension did not function again and the farmer technicians were busy at farming in their own field. Based on these considerations the Ministry of Agriculture decided to reinforce the Extension at the county level. Agricultural Technical Extension Centers (CATEC) were requested to be established in each county, which combined the former technical Extension station, soil & fertilizer station, plant protection station, seed station, research institute and technical training school of the county all together to carry out the agricultural (actually only crop
production) Extension integratedly (See Fig. 1). By the end of 1990 1,286 counties out of the total of about 2,000 had set up their CATEC, about 220,000 townships their TATES (Township Agricultural Technical Extension Station). See Figure 2

Along with the rural reform and development of market economy it has become more and more difficult for the centralized governmental Extension organizations to meet all the demands of farmers for comprehensive services. Decentralized, multi-sectoral and leveled Extension service systems were developed around the middle of 1980's especially since 1988 when the government decided to initiate programs for comprehensive agricultural development which covered almost all the regions in China.

Other centers for animal husbandry, fishery and agricultural machinery were also requested to be set up respectively:

1. Service organizations affiliated with banks, credit cooperatives and insurance organizations. These are mainly for the financial services which production requires.

2. The service provided by research institutes and universities and colleges. Many of the staff were involved in the contract service together with the local Extensionists. About 1,100 counties assigned Deputy Mayors for Service and Technical management. Most of them came from institutes or universities.

3. Farmer self-organizations for service. According to a survey by the Ministry of Agriculture about 77,000 associations for commodity production and/or research and 419,000 specialized production service organizations were organized by farmers privately or cooperatively by the end of 1990.

Community service organizations were developed at township and village levels. The village organizations provided the fine seeds and other inputs, technical advice, plant protection, farm machinery, irrigation and electricity services partially or as a whole. These kinds of organizations were much more developed in the coastal areas such as Jiangsu and Shandong Provinces compared with the less-developed areas in middle and western areas in China. According to a survey in Jiangsu Province 20% of the villages could provide whole-packaged services, 50% some parts of services while 20% only one or none of the services. In the less developed areas the economic capacity is very weak at the village levels. So the services are mainly provided by the township Extension stations, which are still problematic due to the same economic reason.

**Provincial Government Service Organizations Concerned with Agriculture**

**Service organizations of agricultural institutions**

Besides Extension service for crop production there are Extension institutions for animal production, fishery, farming machinery and farm management under their administrative guidance respectively. By the end of 1991 there were about 214,600 units of state Extension for different commodities or services, 327 at provincial level, 2,445 at prefectural/municipality level, about 18,000 at county level and 189,000 at township level. Totally there were about 1.17 millions technicians or staff, 40% of whom were state technicians.
* NATEC = National Agric. Tech. Ext. Center;

Figure 1. The Government Extension Organizations for Crop Production in China.
Figure 2. The Agricultural Knowledge & Information System (AKIS) in China.
Service organizations affiliated with Water Conservancy institution

There are 18,000 service units at county level with 370,000 staff and 30,000 units at district or township levels with 500,000 staff.

Service organizations affiliated with Forestry institution

There are 1,335 county Extension stations with 19,500 staff and 35,000 units at township level with 150,000 staff.

Service organizations affiliated with the sections of the Supply & Market Cooperatives, Commercial Dept. and Export Department

These are mainly for the services of pre- and post-production e.g. inputs supply, product purchasing, processing, storage, transportation, and export. There are branches of S&M Cooperative in every townships, even some villages. So-called Hospitals of Crops for plant protection have been set up in most of townships in recent years.

The Emerging Role of Universities and Colleges in Agricultural Extension and Rural Development in China

One example of the emerging role of the agricultural colleges and universities may be seen by looking at the case of Beijing Agricultural University (BAU) and its Center for Integrated Agricultural Development in the involvement in Extension and rural development.

One tradition of BAU since its founding has been to link theory with practice and to serve the people with education and scientific research. The crop science and animal science programs developed by this University have played an important role in the agricultural production of North China, especially the Beijing Municipality, since the 1950s. By the '70s such kind of work entered a new stage. One of the prominent features was the integrated control of saline alkaline affected soils on the Huanghe, Huaihe and Haihe plain.

A great change happened in the '80s when a wind of reform swept over the Chinese rural areas, including principally a readjustment of the farmers' relationships to production and the rapid development of agricultural production. The farm household responsibility system made the farmer the principal decision-maker in agricultural production and enterprise. The great enthusiasm of the farmer for a better life and better income became a challenge to agricultural universities and scientific research institutions, and it was necessary for BAU to consider a new model for the university to more adequately serve the agricultural and rural development needs.

Facing the new situation of rural economic development, BAU decided to extend its functions for agricultural Extension and rural development involving state-of-art technology and a new administrative unit within the University.

The traditional duties of China's agricultural university included only teaching and scientific research, but the new model adds Extension and development of new technology, thereby forming a 4-pillar, instead of a 2-pillar, system. It was true that some professors had been involved in Extension and developmental work, but such work was done only in spare time. That arrangement was far from meeting the ever-increasing demand for the development of rural commercial economy. The faculty have very heavy loads for teaching and research which doesn't allow them to pay much attention to Extension; furthermore, the Extension and development nowadays requires systematic work. A new discipline of science, called Extension or rural development, has been utilized in the advanced countries. The administrative leaders for BAU recognized the need to establish a specialized unit to carry out agricultural Extension and development.

According to the idea of this new model, a center for agricultural Extension (Center for Integrated Agricultural Development, CIAD), a high tech
development company (NTDC) and a college for continued education (CCE) were established in 1988. The CCE was responsible for training of personnel sent by the Ministry of Agriculture, Ministry of Personnel, as well as by the local governments.

The main task of the NTDC is to transfer the results of scientific research of the university into commercial utilization. This could be done through joint development and transfer of technology. Two convincing examples were the development of Yield Increasing Bacteria, and Seed Coating Agent.

The activities of the CIAD included Extension, training and information service. With these implements, the members of BAU were involved directly into the integrated development of the rural area. They are mainly young masters degree holders and lecturers. Faculties from departments and colleges who worked on shared responsibility were integrated into the system.

The direct involvement of agricultural colleges or universities in Extension and rural development work should complement and supplement the local Extension work. The work of the colleges and universities should be characterized by integration, training, and demonstration. Integration of science and technology is essential for farmers, the agricultural sector, and rural industries. For example, the integration of elite cultivar, soil management, fertilization, irrigation, cash crop production, feed production, animal production and processing. The integration of packaged technology, management practices, and marketing information rather than isolated bits of technology as developed by researchers.

The goal of training, as provided by the university, includes technology, management and the elevation of the general intellectual level of the farmer. And the demonstrations are an indispensable part of the process, leading to the above goals, for it is through demonstration that farmers may be convinced of the appropriateness of new technology and the new knowledge.

The four fundamental concepts used by BAU in its direct involvement in agricultural and rural economic development since 1988 are as follows:

a. The incorporation of personnel with sole and shared responsibilities. A team of persons with sole responsibilities was established. The main tasks of this team includes: 1) Integrated Extension and development work; 2) Extension of integrated technology on large areas; 3) Multi-disciplinary consultation and training; 4) Sending technology deputy county chiefs for training; and 5) Organization of specialists for target problems and decision making in the localities. The tasks of the shared responsibility members are mainly the Extension and demonstration of the results of their scientific research.

b. The incorporation of multi-disciplinary and single-disciplinary Extension. The objective of rural development has changed from self sufficiency to better income, leading to new demand for Extension work and different competencies. Sending a few scientists to a pilot village to do a few demonstrations is far from enough. In addition to knowledge of science and technology the new Extension workers should also acquire understanding of sociology, economics, and the process of change.

c. The integration of single Extension bases with the surrounding area. A region known as the 3-H region was targeted for BAU's Extension and development work. Integrated Extension bases were established. The Extension works were different from the base as compared to its diffusion area. The works on the diffusion area were mainly undertaken by local personnel trained by the university's Extension service.

d. The integration of internal work and the works of external local region. Through BAU's internal network of training,
demonstration and information service, in cooperation with local institutes of agricultural development, Extension and training, the results of the scientific achievements of BAU have become a constant flow toward the rural area, forming a university-locality cooperative working system for regional rural development. About 20 counties around Handan, Cangzhou and Hengshui prefectures of Hebei province have been included into this system, although the development was of different types, at different levels and on different scales.

The following are several approaches through which BAU has been involved for local rural development.

a. **Training:** This work was mainly done by the CCE (College for Continuing Education), with very good results. E.g., two training classes on farm management have been opened for Shunyi County of Beijing since 1988. The total number of trainees was 277, mostly directors from different farms in this County. The duration of training is 1.5 years. Sixteen courses were taught in each class including courses on agricultural technology, farm management and practice. Although most of the trainees were experienced agricultural workers, they found the training very helpful in the elevation of their theoretical levels, practical capabilities, creativity and initiative. Most of them have made new contributions after returning to their original places. For example, although part of Shunyi County was flooded in 1991, a good harvest was finally obtained through the efforts of these farm directors and their colleagues.

b. **Practical research:** The most outstanding example is the "Integrated management of the 3-H region of middle-to-low productivity" in which BAU played a leading role. The 3-H region, i.e., the Huanghe, Huaihe and Haihe river regions, form the largest plain in China, including 5 provinces and 2 municipalities. It is also one of the main areas for cereals and cotton, producing 60% of the cotton and 1/3 of the cereal of the whole of China’s production. But drought, waterlogged, sandy and saline soils have been the main obstacle for better yields here for thousands of years.

BAU started the work of integrated transformation of saline soil in this area in the '70s. The work was included in a national project in the 6th 5-year plan. Entrusted by related institutions (including State Planning Commission, State Science and Technology Commission and the Ministry of Agriculture) BAU became the lead organization of a project for the improvement of the 3-H region in the 7th 5-year plan. A team including 1141 scientific researchers, among them about 200 were teachers from BAU's different colleges and departments, from 204 institutions scattered all over this region was organized. Twelve comprehensive experimental districts were established with an area of 217,000 mu including 28 sites for specific experiments, with an area of 750,000 mu. There were also 3.69 million mu in demonstration districts and 6.0 million mu in diffusion districts. The average yield per mu and average income per capita in 1989 in the experimental districts were 93% and 56% more than in 1985 respectively. The increase of forest coverage was 14% to 20%, and the reduction of area of saline soil was 70%, indicating outstanding social, economical and ecological effects.

Under the leadership of President Shi Yuanchun, a large quantity of manpower and resources of BAU have been devoted to this project. Two experimental stations, Quzhou and Longwanghe, were established. Two hundred faculty members and 500 graduate and undergraduate students (man-times) participated in the work and 18 research achievements obtained, five of which have been honored by national, provincial or ministerial awards. The area of Extension was 12 million mu, and the economical gain 420 million RMB.
c. **Integrated Extension and development**: With CIAD as the principal core, the different technological practices were blended at different Extension bases into various combinations suitable for different localities. The Extension of these technology combinations was implemented with the local government. In order to do this local cadres, technicians and advanced farmers were selected for further training provided by CIAD.

Results of 38 scientific research programs have been utilized in Extension and rural development since 1988. These have involved research by related departments or colleges. Faculty members and students were organized to participate in national integrated agricultural development projects. Experiments were carried out on an area of 0.5 million mu, diffused to an area of 29.25 million mu, leading to increases in yield for different crops, including 1.02 billion kg of cereals, 87 million kg of cotton, 64, million kg oil crops and 29 thousand tons of meat, increasing economic benefit of 1.113 billion RMB; 1.063 million mantimes of technicians and farmers have been trained, and 1.23 million copies of technical reference materials have been distributed, all in 4 years.

d. **Materials for fee**: Most of our services were conducted free of charge. But some of them were provided for a fee. These were principally for business of the NTDC, and has brought economic gains for the university. Examples include production of food-processing quantities of Gibberish Acid, Zearalanol (Raglro), Seed Coating Agent, as well as improved cultivars and better breeds of domestic fowls and animals.

e. **Consultation**: It has been a tradition for the scientists and professors of this university to undertake consultation work at different levels (provincial, municipal, prefectural and county level), with encouraging results.

f. **Role of deputy chief**: Many scientists of BAU have been assigned position of deputy county chiefs, or deputy mayors in counties or municipalities to be in charge of science and technology management.

**Some Reflections**

The experiences gained by members of the Center Rural Development at Beijing Agricultural University through the Extension activities have been expressed through three key points. First, there is urgent need for multi-disciplinary Extension service. The traditional rural Extension service is usually based on single disciplines. But after the political and economic reform in the rural areas, this type of service can not satisfy the present demands from farmers and the rural communities. What the rural community really needs is an integrated service of multi-disciplines. The future Extension work should be oriented toward this direction.

Second, new demand will lead inevitably to new concepts. A former, and obsolete, conception of Extension work was that it is a low-level job, and could be undertaken by persons with inferior capability as compared with the teaching staff or researchers. But the new demand of the reformed rural people has endowed a completely new concept to the term "Extension", and only the most capable, most active and best informed persons could handle such a job.

And third, financial support for Extension is required. The involvement of agricultural colleges and universities in Extension can assist in the development of agriculture and the local economy, but the expense of their Extension activities needs financial support. And from where this support could come is a problem not yet solved.

**Some Suggestions for the Future**

It is necessary that the agricultural colleges or universities take teaching, scientific research, Extension and development as a whole entity. Extension and development provide a bridge linking the university with the farmers and the rural area. The successful involvement of the
university in the local efforts, combining the agricultural education, research and Extension as a whole in assisting farmers and communities to achieve desired development, must depend upon the realization of the specialization of these functions within the universities. The experience of BAU in the last 10 years indicated that without a specialized Extension and development unit, there shall never be a breakthrough. After the establishment of CIAD of BAU in 1988, similar organizations were established in Hebei Agricultural University and other colleges and universities. It is suggested, therefore, that the National Education Committee and the Ministry of Agriculture could establish similar Extension service centers in a few selected agricultural colleges and universities, in cooperation with the various Extension organizations, to develop a better approach to provide services for agricultural and rural development.

The establishment of the Extension centers in agricultural universities should be based on the spirit of reform. Their work and the work of the local Extension services should be mutually complementary. Emphasis should be put on the integration of the results of scientific research of the university, so that programs could be adapted to local conditions and satisfy the different local demands, the consultation, training and information services.

It is suggested that the State Education Commission, the Ministry of Agriculture and the State Science and Technology Commission lend their support to the establishment of legislative-defined Extension districts with responsibility assigned to agricultural universities, colleges and research institutes. There are 66 agricultural colleges or universities and numerous agricultural schools in China. Pulling together, they will form a mighty force. If college responsibility for Extension districts could be legislatively defined and the problem of financial support solved by subsidies from land occupation tax, rural industries, tax on specific products, etc., then the work of Extension and rural development will be greatly strengthened. It is suggested that BAU could be the first experimental site of this new endeavor.

A university-technical school-agricultural middle school training system and a university-county-township-village information service, demonstration and Extension system should be established. This will develop gradually into a Chinese type of university-involved integrated agriculture-science-education entity.