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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 develop implications for international agricultural and extension education. **Manuscripts, or portions of manuscripts, must not have been published or be under consideration for publication by another journal.**

Three types of articles are solicited for the *JIAEE*: Feature Articles; Commentary Articles; Tools of the Profession Articles; and Book Reviews.

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Feature articles focus on philosophy, current or emerging issues, and the methodology and practical application of specific research and appropriate technologies, which have implications for developed and developing countries. For publication in the *JIAEE*, feature articles must pass the *JIAEE’s double blind, referee process*, where peer reviewers evaluate manuscript content and ensure readability. Reviewers are selected from the AIAEE membership. In the double blind, referee process, all references to authors are removed before the manuscript is sent to reviewers. Feature Articles may be submitted for peer review a total of three times before they are no longer acceptable for publication in the *JIAEE.*

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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 *JIAEE.* Commentary articles are reviewed by two members of the Editorial Board for appropriateness, readability, and relevance to the *JIAEE.*

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

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Book reviews summarize new publications relevant to the field and provide a critical assessment.

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Journal of International Agricultural and Extension Education

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From the Editors

Keywords are

The *Journal of International Agricultural and Extension Education* has identified 11 knowledge categories and five U.N. Geographical Regions for which research is reported. When we moved to the online Manuscript FastTrack, a content analysis was conducted with all past issues to determine appropriate keywords for indexing purposes. When you are submitting a new document, you should look at the document topics to determine your five to seven key words to include on your manuscript. Reviewers are selected based upon these key words. It is necessary for authors to also select the document topics when submitting a manuscript. This can be easily achieved by holding down the control key, scrolling through the document topics, and clicking on those key words.

The eleven topics encompass the multidisciplinary nature of our work, but should specifically define our knowledge areas for the profession. They are:

1. **Education** (Adult Learning, Curriculum Issues, Distance Learning, Experiential Learning, Faculty Teaching, Higher Education, Information Technology, Primary/Secondary Education, and Student Issues);
2. **Environmental Issues** (Agro-ecology, Energy, Ecotourism, Health Care, Natural Resources, Solid Waste Management, and Wildlife Biology);
3. **Extension** (Administration and Policy, Curriculum Development, Delivery, Methods, Programs, Systems and Models, and Theory and Practice);
4. **Partnerships** (Community-based Organizations, Cooperatives, Governmental Organizations, Non-Governmental Organizations, and Public-Private Networks);
5. **Perspectives** (Age, Ethnicity, Gender, Historical, and Philosophical);
6. **Planning and Evaluation** (Accountability, Competencies, Needs Assessment, Program Effectiveness, and Program Evaluation);
7. **Management** (Administration, Communications, Leadership, and Marketing);
8. **Managing Change** (Change Theory, Entrepreneurship, Planned Change, Public Good, Social Change, and Technology Transfer);
9. **Research and Methods** (Case Study Research, Experimental Research, Participatory Rural Appraisal, Qualitative Research, Rapid Rural Appraisal, and Survey Research);
10. **Teaching and Learning** (Instructional Design and Delivery, Learner Characteristics, Learning Outcomes, Learning Theory, Teacher Education, and Teaching Methods);
11. **Training and Development** (Capacity-Building, Community Development, Farmers, Human Resource Development, Participatory Training, Professional Development, Programmatic Issues, Sustainable Development, and Youth Organizations); and

Choosing keywords from the document topic list in the Manuscript FastTrack allows us to match manuscript reviews and determine the appropriateness of the article to our readership.

Sincerely,

James R. Lindner and Kim E. Dooley, Editors

*Journal of International Agricultural and Extension Education*
A Study of Organic Farming in Ohio with Lessons for Developing Countries

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Abstract  
Agricultural extension workers worldwide should not view the pioneering efforts of organic farming in the United States and Europe as a spectator sport but rather for its potential for achieving food security in developing countries. The advantages of organic agriculture, such as the ability to make a profit on a small acreage without chemical fertilizers, offers promise for improving subsistence agriculture. This study of organic farmers in Ohio, U.S.A. found that not only is organic farming environmental sustainable but it is also economically viable. However, the farmers were concerned that Extension workers had limited knowledge of and support for organic agriculture. The lack of knowledge and support of Extension for organic agriculture should be addressed so that organic agriculture can enrich subsistence farming and food security. The study concludes that rather than being apprehensive of organic agriculture, Extension workers should be proactive in embracing organic farming as an innovation for the 21st century.

Keywords: Organic farming, extension, sustainable development, communication, food security, developing countries, managing change
Introduction

To the surprise of many, organic agriculture in the United States is booming, not waning. The fact that these farmers are able to increase yields without any use of chemical fertilizers implies that the technique may have benefits for small farmers in the developing world, particularly in Africa where many of them cannot afford chemical fertilizers. This paper argues that Extension systems worldwide, but particularly in the developing countries, should examine organic farming for the benefits it offers small farmers worldwide.

To say that organic farming is one of the fastest growing sectors of the U.S. agricultural industry may be an understatement. Annual revenue from organic farming rose exponentially, from $78 million in 1980 to $7 billion in 2000 and nearly $10.4 billion in 2003. Sales of organic foods are expected to reach $23.8 billion by 2010 (Oberholtzer, Dimitri, & Greene, 2005). In spite of this growth, not much extension literature is available about these farmers, such as their characteristics, motivation, and relationship with Extension. The purpose of this study was to describe the characteristics of organic farmers in Ohio, the philosophical beliefs driving them and their need for extension services. In a way, this study provides a useful Ohio-specific update to the Fourth National Organic Farmers’ Survey (OFRF 2004), which asked a similar range of questions (Walz, 2004).

Meaning of Organic Agriculture

Organic agriculture and sustainable agriculture are frequently confused with each other. However, the distinctions are clear. Diver (2006) and Conford (2001) define sustainable agriculture as the overall effort to preserve and prolong the use of the earth’s resources by reducing the human toll on the eco-system, particularly, the use of agricultural chemicals. In short, sustainable agriculture farmers seek to reduce, not necessarily eliminate, the use of chemical fertilizers, insecticides, and herbicides in farming. On the other hand, “organic” or better yet, “certified organic” farming strictly forbids the use of chemicals, whatsoever (The Organic Foods Production Act, 1995). However, the distinction between the two is becoming increasingly blurred. Charles Fry (2007), executive director of the Innovative Farmers of Ohio notes that the confusion is compounded by the raging debate between what is “real organic” and what is “industrial organic,” a controversy that, he adds, gets even messier when one throws into the mix, the question of “local” food sources. However, this paper focuses on organic agriculture, that is, farmers who do not use chemical fertilizers. Their philosophy seems to be based on Shafer’s (1982) book, The Cornucopia Project: Toward a Sustainable Ohio in Food, Farmers and Land. In it, the author cites a Kenyan proverb, which succinctly captures the quintessence of environmental sustainability: “We should think of our resources not as having been left to us by our parents but as having been loaned to us by our children” (p. 2). Our overall interests were to discover what drives these farmers to engage in organic agriculture and their need, if any, for Extension.

Purpose and Objectives

The main purpose of the study was to inform international agricultural extension educators of the benefits of organic agriculture to small farmers in developing countries. The specific objectives of the study were:
1. To describe the characteristics of Ohio organic farmers;
2. To examine the philosophical principles that drive the practice of organic farming; and
3. To examine the relationships between certain variables associated with organic farming.

**Methods**

The study was conducted in Ohio in December 2005. Questionnaires were mailed to members of two organic farming organizations. With the first farming organization, all 129 members of the Innovative Farmers of Ohio (IFO) were surveyed, yielding 66 responses or a response rate of 51.2%. In the second, a random sample of 100 out of 250 registered organic farmers who were members of the Ohio Ecological Food and Farm Association (OEFFA) was interviewed, yielding 33 responses or a response rate of 33%. Thus, a total of 99 farmers were studied. The results describe the survey respondents, that is, members of the IFO and OEFFA, the main organic farming organizations in Ohio. It cannot be extended to represent the characteristics of all organic farmers in Ohio because the survey was not based on a random selection of all organic farmers in this state.

The survey was developed by the researchers and content validity was assessed by a panel of experts, such as organic farming specialists at the state and county levels. Likert type questions on a six-point scale with 1=very strongly disagree, 2=strongly disagree, 1=disagree, 4=agree, 5=strongly agree, and 6=very strongly agree were used to measure philosophical beliefs about farming and organic farmers’ perceptions of Extension. A 4-point Likert type scale with 1=Highly serious problem, 2=Serious problem, 3=Problem and 4=Not a problem, was used to determine constraints Ohio organic farmers endure.

The questionnaire was divided into seven areas, such as their philosophical beliefs about farming, marketing issues, and perception of Extension. All the questions were closed-ended which allowed respondents to select among alternatives, fill in or simply a box. The closed-ended responses make it possible to manipulate data bases to determine totals, averages and overall rankings. However, there was an open-ended section where respondents could provide comments on the topic.

The internal consistency of the instrument was measured using Cronbach’s alpha, which yielded a reliability of .97 for constraints Ohio organic farmers face (23 items), .86 for organic farmers’ perception of Extension (12 items), and .32 for the philosophical beliefs (10 items). The reliability of .32 for philosophical beliefs was less than the 0.50 suggested by Nunnally (1967). According to Baker (1999), the reasons for low reliability include having few questions and/or questions worded ambiguously. He recommends increasing reliability by raising the number of questions and/or wording questions more clearly. The Statistical Package for the Social Sciences (SPSS, 2005) was used to analyze the data. Descriptive statistics, such as frequencies, percentages, means and standard deviations were used to summarize the data.

**Findings**

The findings are presented in three sections based on the research objectives, namely, characteristics of Ohio organic farmers, their philosophical principles and practices; and the relationship between selected organic farming variables.
Characteristics of Ohio Sustainable Farmers

This section reports findings of the study focusing on the characteristics of Ohio organic farmers. The main areas reported include types of farming systems, farm incomes, education, marketing techniques, attitude towards extension, and philosophical beliefs about farming.

Types of Farming Practices

Farmers were asked to describe the type(s) of farming practiced by choosing one or more from a set of categories: “conventional,” “organic,” “certified organic,” “transitional,” “sustainable,” “grass-based” and “other specify.” They were allowed to select more than one category because one farmer could have different farming operations. For example, a farmer may have a certified organic vegetable operation and also a small beef production under transition agriculture. The types of farming practices were not defined for respondents because it was assumed that they were familiar with these terms. Table 1 shows that 52 respondents or 52.5% of those surveyed were certified organic, 35 were organic, 41 sustainable, 34 grass-based and 9 transitional. Only 14 identified themselves as conventional farmers.

Table 1

<table>
<thead>
<tr>
<th>Type of Farming Practice</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified organic</td>
<td>52</td>
<td>52.5</td>
</tr>
<tr>
<td>Organic</td>
<td>35</td>
<td>35.4</td>
</tr>
<tr>
<td>Sustainable</td>
<td>41</td>
<td>41.4</td>
</tr>
<tr>
<td>Grass-based</td>
<td>34</td>
<td>34.3</td>
</tr>
<tr>
<td>Conventional</td>
<td>14</td>
<td>14.1</td>
</tr>
<tr>
<td>Traditional</td>
<td>9</td>
<td>9.1</td>
</tr>
</tbody>
</table>

Note that the total number of respondents could exceed 99 because a farmer could check more than one category.

This may also explain why all respondents said they were members of sustainable organizations but only 41% said they had “sustainable farms.” It does not mean that the remaining 59% do not consider their farms sustainable.

Farm Incomes

Farmers were asked to check the categories that best described their estimated gross farm incomes for 2004, the year preceding the study. They were also asked to indicate how successful they were as organic farmers, compared to other farmers in their areas. In general, the gross farm incomes of organic farmers in the study varied widely from “$15,000 or less” to “over $200,000” per year. Forty-five respondents had incomes of $15,000 or less, and 15.2% had incomes between $16,000 and $30,000. Another 15% had incomes ranging from $31,000 to $100,000 and 13% had incomes between $101,000 and $200,000 per year. Only 7% of those studied indicated having farm incomes estimated at more than $200,000 per year.

However, farm income is only a fraction of the overall income of organic farmers in Ohio. The vast majority of respondents (59%) said that farm income constituted less than 50% of their incomes. About 11.1% said it was about 50% of their real incomes and 29.3% said it was more than 50% of what they made that year. These figures are similar to the national survey which found that 46% of respondents said farm income made up about 25% of their incomes compared to 56% in this study; 19% said it was about 50% compared to 11% in this study; and 35% said it was over 50% compared to 30% in this study (Walz, 2004).

Thirty-seven percent of respondents felt that their farm incomes have been better, since becoming certified. Only 11.1% felt their incomes remained the same. Similarly,
37.5% said the quality of life for their families had improved since adopting organic farming compared to only 12.1% who felt their families’ quality of life had remained the same and only 2.5% who said their families’ quality of life had worsened.

**Number of Years Farming Organically**

Respondents were also asked to indicate how long they have been farming organically. Nearly 40% said they have been farming this way for nine years or less and about an equal number, 37.7% said they have been farming this way, 10 years or more. About 21% of respondents did not answer the question. The national survey found that 79% of the respondents were certified organic for 10 years or less. Another 17% of respondents qualified as organic for 11 to 20 years and 13% of respondents were farming organically for 20 years or more (Walz, 2004).

**Likelihood of Expanding Farm Size**

About 56.6% of respondents said they were likely to expand their operations in the next 5 years. Only 19% were not likely to do so and 21% were not sure if they would expand production. Also, over 60% of respondents rated their incomes as average or above average compared to non-organic farmers in their areas. Only 15.2% said they were below average and 12%, were not sure. In all, 72.7% of respondents said they were “somewhat successful” to “very successful” as organic farmers; only 2% said they were not successful.

**Age**

On age, the study found that, Ohio’s organic farmers mirror other farmers in the State in that they were older and no younger ones emerging to replace them. Only 9 farmers (9.1%) were aged 35 years or less; 50 (50.5%) were aged 35 to 55 years, and 34 (34.4%) were aged 56 years and older. These figures are in line with the USDA (2002) statistic, which showed that the number of farms operated by 25 – 44-year-olds is on the decline, while the number increased for those 45 and older. Curet (2006) reported that nationwide, the percentage of farmers aged 35 years or younger is the lowest it has ever been and noted, however, that Ohio’s farmers are traditionally slightly younger than the national population. The average age of farmers nationally increased to 55.3 in 2006, from 53.3 in 2002. However, in Ohio, the change was from 52 in 1992 to 53.8 in 2006.

**Education**

With respect to formal education, Ohio organic farmers have educational levels comparable to their counterparts in the rest of the country. Of the 99 respondents surveyed, 9 (9.1%) had doctorate degrees, 15 (15.2%) had Master’s degrees, and 28 (28.3%) had bachelor degrees. Of the remainder, 20 (20.2%) had some college experience, 13 (13.1%) had high school education and only 2 (2.0%) had no formal education. Twelve out of the 99 respondents did not answer this question. In essence, about 56% of the study population had at least a bachelor degree. Gibbs (2005) reports that nearly one in six rural adults in 2000 had a bachelor degree, that is, about 16% of the rural population compared to about 12%, for farming communities. The national survey found that 81% of those who responded had formal education, that is, high school education or less. More than 25% had a bachelor’s degree and 20% of the respondents had graduate degrees (Walz, 2004).

**Ethnicity and Farm Size**

The vast majority of Ohio’s organic farmers in the study were White (Non-Hispanic), accounting for 88 (88.9%) of respondents, followed by three Native-
As for farm size, 16% of them had five acres or less. Twenty-one percent had 11 to 50 acres and a commanding majority, 55.6% had farm sizes of over 50 acres. Again, Ohio’s organic farmers may not be typical of small farmers who, generally, have less than 50 acres and considered resource poor.

Sources of Information on Organic Farming

Other organic farmers constitute the primary source of information on organic farming for Ohio organic farmers, followed by the OEFFA, organic farming conferences, farm tours, and the IFO (Table 2). Over 86% mentioned “Other organic farmers” as their primary source of information about farming, followed by the OEEFA (79.8%); conferences (73.7%); farm tours (70.5%); and the IFO (68.7%). The Ohio Agricultural Research & Development Center (OARDC), the Land-Grant Experiment Station, received a modest mention, by 38.4%. However, county extension educators, commercial seed, fertilizer and equipment dealers and the Ohio Farm Bureau received least mention. The low ranking of Farm Bureau and commercial seed and fertilizer companies is not surprising as organic farmers hardly patronize services or inputs from these organizations.

Table 2

Organic Farmers' Sources of Information

<table>
<thead>
<tr>
<th>Source</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other organic farmers</td>
<td>86</td>
<td>86.9</td>
</tr>
<tr>
<td>Ohio Ecological Food and Farm Association (OEFFA).</td>
<td>79</td>
<td>79.8</td>
</tr>
<tr>
<td>Conferences</td>
<td>73</td>
<td>73.7</td>
</tr>
<tr>
<td>Farm Tours</td>
<td>70</td>
<td>70.5</td>
</tr>
<tr>
<td>Innovative Farmers of Ohio (IFO)</td>
<td>68</td>
<td>68.7</td>
</tr>
<tr>
<td>Ohio Agricultural Research &amp; Development Center (OARDC).</td>
<td>38</td>
<td>38.4</td>
</tr>
<tr>
<td>Sustainable agricultural seed and equipment dealers.</td>
<td>35</td>
<td>35.4</td>
</tr>
<tr>
<td>Organic Crop Improvement Association (OCIA)</td>
<td>28</td>
<td>28.3</td>
</tr>
<tr>
<td>Farmers in other countries</td>
<td>24</td>
<td>24.5</td>
</tr>
<tr>
<td>The Ohio State University Faculty (Non-Extension faculty).</td>
<td>18</td>
<td>18.2</td>
</tr>
<tr>
<td>County Extension Educators.</td>
<td>16</td>
<td>16.2</td>
</tr>
<tr>
<td>Commercial seed, fertilizer and equipment dealers.</td>
<td>8</td>
<td>8.1</td>
</tr>
<tr>
<td>Ohio Farm Bureau</td>
<td>3</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Note. * Percentages do not add up to 100.

Communication Networks

A communication network refers to a system of relationships through which participants share information (Severin & Tankard, 2004). Table 3 shows that organic farmers interact with a wide range of sources. However, the interaction is most intense with other farmers in Ohio. Over 71.7% of respondents contacted other farmers at least once last year and a substantial number contacted other farmers 15 times or more in a year. Organic and sustainable agriculture organizations were also heavily contacted and so were county extension educators. Least used were organic farmers in other countries, which
was surprising because in the 1980s, these farmers relied heavily on information from organic farmers in other countries (Kazan & Agunga, 1997).

Table 3

Organic Farmers’ Communication Networks

<table>
<thead>
<tr>
<th>Organization/Individual contacts last year</th>
<th>Never</th>
<th>1 – 2</th>
<th>3 – 6</th>
<th>7 – 14</th>
<th>15+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic farmers in Ohio</td>
<td>5</td>
<td>14</td>
<td>18</td>
<td>11</td>
<td>27</td>
</tr>
<tr>
<td>Organic/sustainable agricultural organizations</td>
<td>5</td>
<td>22</td>
<td>22</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>County Extension Educators</td>
<td>19</td>
<td>36</td>
<td>13</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Organic farmers outside Ohio (U.S.)</td>
<td>26</td>
<td>24</td>
<td>13</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Ohio Ag Research and Experiment Station</td>
<td>30</td>
<td>26</td>
<td>9</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Organic research stations</td>
<td>38</td>
<td>26</td>
<td>9</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Organic farmers in other countries</td>
<td>56</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Channels of Information

As shown in Table 4, the printed medium, mainly organic magazines/newsletters was the primary source of information on organic farming for these farmers. It was mentioned by 85.9% of respondents; followed by the World Wide Web and the Internet. Television and radio were the least important sources of information on organic farming. The national survey found that 78% of respondents had Internet access; 61% used the Internet to check weather and 50% used it to look for organic market information (Walz, 2004).

Table 4

Organic Farmers’ Main Channels of Farming Information

<table>
<thead>
<tr>
<th>Source</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic magazines/newsletter</td>
<td>85</td>
<td>85.9</td>
</tr>
<tr>
<td>Web site/Internet</td>
<td>59</td>
<td>59.6</td>
</tr>
<tr>
<td>Newspapers</td>
<td>21</td>
<td>21.2</td>
</tr>
<tr>
<td>Radio</td>
<td>3</td>
<td>3.1</td>
</tr>
<tr>
<td>Television</td>
<td>3</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Philosophical Beliefs of Organic Farmers

The main objective of the study was to examine the philosophical principles that drive organic farmers. Table 5 shows that the two overwhelming factors that drive the practice of organic agriculture were: a) a firm belief that rural communities are essential for American agriculture success; and b) an unwavering commitment to environmental sustainability. These points were noted by 98 out of the 99 respondents. Other compelling reasons included: a) an interest in preserving farming as a lifestyle, community-centeredness or social responsibility, meeting America’s food needs, and profitability. Although profitability is an important factor, it did not appear to be the driving force. Another important belief that seems to unite organic farmers is a conviction of the harmful effects of chemical fertilizers. Eighty-seven out of the 99 respondents, almost 88% of respondents, agreed on this. Organic farmers are also convinced that they can produce enough to meet America’s food needs. The national survey also found environmental consciousness as the main reason why farmers practice organic. Other reasons included environmental stewardship, ecosystem management and lifestyle choices (Walz, 2004).
Table 5

*Philosophical Beliefs of Organic Farmers*

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural communities are essential for American agriculture’s future success.</td>
<td>98</td>
<td>98.9</td>
</tr>
<tr>
<td>Environmental stewardship is important to me.</td>
<td>98</td>
<td>98.9</td>
</tr>
<tr>
<td>Farming is a lifestyle.</td>
<td>91</td>
<td>91.9</td>
</tr>
<tr>
<td>Organic farmers should be involved in community decision-making.</td>
<td>76</td>
<td>76.6</td>
</tr>
<tr>
<td>Small farms can meet America’s food needs.</td>
<td>75</td>
<td>75.7</td>
</tr>
<tr>
<td>Profit should be the driving force for farming.</td>
<td>66</td>
<td>66.6</td>
</tr>
<tr>
<td>Corporate farms should be licensed as organic farms.</td>
<td>53</td>
<td>53.6</td>
</tr>
<tr>
<td>I farm organically because it is profitable.</td>
<td>38</td>
<td>38.5</td>
</tr>
<tr>
<td>Organic farmers should use human waste as fertilizer.</td>
<td>19</td>
<td>19.1</td>
</tr>
<tr>
<td>Organic farmers should use synthetic fertilizers.</td>
<td>12</td>
<td>12.1</td>
</tr>
</tbody>
</table>

*Relationship between Certain Variables Associated with Organic Farming*

Correlation analysis (Table 6), using *Pearson r* was run on variables relating to why farmers think consumers shop organic. Based on Davis’ (1971) conventions for describing magnitude of relationships, a significant, positive, substantial relationship was found between organic food is fresher and organic food tastes better, that is, those who said consumers buy “organic foods because it is fresher” also said they do so because it “tastes better” (*Pearson r* = .631, *p* = < .01, n=95). There was also a significant, positive and substantial relationship between those who said consumers shop organic to support local farmers and those who said they do so in support of organic farmers (*Pearson r* = .623, *p* = < .01, n=95). Also, a significant, positive, substantial association was found between organic farmers who said consumers buy organic because of the environmental benefits and those who said they do so because of the food safety benefits (*Pearson r* = .606, *p* = < .01, n=98). There were also significant, positive and strong relationships between “farmers they know and trust” and “friendly service” (*Pearson r* = .587, *p* = < .01); between “support of local farmers” and “farmers they know and trust” (*Pearson r* = .572, *p* = < .01, n=96); and between “because organic foods are healthier” and “organic food tastes better” (*Pearson r* = .528, *p* = < .01, n=95).
Table 6

**Relationship between Certain Variables Associated with Organic Farming**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Support of local farmers</td>
<td>—</td>
<td>.62*</td>
<td>.52*</td>
<td>.08</td>
<td>.33*</td>
<td>.20</td>
<td>.57*</td>
<td>.48*</td>
<td>.08</td>
<td>.15</td>
<td>-.13</td>
</tr>
<tr>
<td>2. Support of organic farmers</td>
<td>—</td>
<td>.57*</td>
<td>.22*</td>
<td>.34*</td>
<td>.33*</td>
<td>.43*</td>
<td>.52*</td>
<td>.27*</td>
<td>.23*</td>
<td>.24*</td>
<td></td>
</tr>
<tr>
<td>3. Friendly service</td>
<td>—</td>
<td>.12</td>
<td>.48*</td>
<td>.27*</td>
<td>.59*</td>
<td>.40*</td>
<td>.06</td>
<td>.25*</td>
<td>.24*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Food safety benefits</td>
<td>—</td>
<td>.19</td>
<td>.61*</td>
<td>.10</td>
<td>.16</td>
<td>.55*</td>
<td>.27*</td>
<td>.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Reasonable price</td>
<td>—</td>
<td>.25*</td>
<td>.37</td>
<td>.29*</td>
<td>.10</td>
<td>.27*</td>
<td>.17</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>6. Environmental benefits</td>
<td>—</td>
<td>-.03</td>
<td>.52*</td>
<td>.42*</td>
<td>.28*</td>
<td>.30*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Farmers they know &amp; trust</td>
<td>—</td>
<td>.48*</td>
<td>.11</td>
<td>.27*</td>
<td>.26*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Learn where their food comes from</td>
<td>—</td>
<td>.21*</td>
<td>.32*</td>
<td>.35*</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Because organic foods are healthier</td>
<td>—</td>
<td>.53*</td>
<td>.33*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Organic foods tastes better</td>
<td>—</td>
<td>.64*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Organic food is fresher</td>
<td>—</td>
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</tbody>
</table>

*Note. * $p < 0.05$ (two-tailed)*

From this analysis (Table 6), it would seem that farmers are convinced that consumers buy organic food because of economic, health, social, and environmental benefits. Economically, organic foods are said to be fresher, safer, tastier and healthier. It is also said to have environmental benefits. Still yet, the social benefits are said to include supporting local farmers, supporting organic farmers, supporting farmers they know and trust, rewarding friendly service, and providing an opportunity for them to learn about where their food comes from. These findings are in agreement with Rauch, Smith & Sharp (2005), Batte, Ernst & Darby (2005), and Chen (2005).

**Discussion**

This study set out to examine the growing phenomenon of organic agriculture in the United States and the implications it has for the future of agriculture worldwide. Although this was a microscopic study, focused only on a small group of organic farmers in Ohio, there are significant lessons for developing countries.

The researchers were driven to this study because Agunga (1995) conducted a similar one, which showed that at best, Ohio Extension agents were skeptical of the survivability let alone profitability of organic agriculture. Almost a decade later, organic farming is flourishing not only in Ohio, but also throughout the United States and Western Europe (International Federation of Organic Agriculture Movements, 2007).

We found three characteristics of organic farmers in Ohio, which offers lessons for farmers in developing countries. First, compared to conventional farmers, organic farmers generally have small farm sizes. Second, they are driven by an ecological paradigm that is, lengthening the longevity of Mother Earth through non-use of farm chemicals. And, third, they have demonstrated that small can be profitable, to play off Schumacher’s (1999) book, *Small is beautiful*. 

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For developing countries, with nearly 70% of their populations engaged in subsistence agriculture, the success of organic farming in Ohio has several implications as farm sizes are small, the land highly degraded and farmers are without money to purchase chemical fertilizers, even if they wanted to (George, 1996). It follows from the foregoing that extension systems that are committed to improving the living conditions of farmers elsewhere, especially in Africa should examine the benefits organic agriculture offers these farmers.

Conclusions and Recommendations

Based on the findings of this study, several conclusions can be drawn. First, in terms of demographics, such as age, level of education, and farm size Ohio organic farmers mirror the rest of the U. S. farming population. Therefore, it is possible that the experience of organic farmers can be replicated by farmers elsewhere. Second, the philosophical driving force behind the practice of organic farming is concern for the environment. When people are committed to a cause they do everything possible to achieve it. Thus, the position taken by these farmers offers a lesson for the general public. Third, in spite of the relatively small farm sizes, organic operations are deemed profitable. Thus, the answer can be told: Organic farming is not only environmentally friendly, but it can also be financially profitable for developing countries. Fourth, many organic farmers have been in business for 10 or more years without chemical fertilizers. It implies that organic farming is not only profitable but also sustainable. Finally, a general concern expressed by the organic farmers in the study was that extension agents did not know enough about organic agriculture to be of much help to them.

Based on these conclusions, the following recommendations are made. First, organic farming has many characteristics that should make it appealing to farmers in other countries, especially in the developing world. These qualities are: (a) smallness of operation, (b) non-use of synthetic chemicals, (c) sustainability, and (d) profitability. For these reasons, developing countries stand to gain by adopting organic agriculture as part of their poverty reduction strategies.

Second, organic farming offers a lesson for international extension scholars, which is that they must be proactive in embracing change rather than always looking in the rearview mirror. For example, in spite of 30 years of organic agriculture success, the researchers could not find any citations in the *Journal of International Agricultural and Extension Education (JIAEE)* on the subject. Yet, we believe that many aspects of organic farming should be of interest to *JIAEE* researchers, such as communication/educational techniques used by organic farmers to community-driven development and to demand agronomists to conduct on-farm research.

Third, organic agriculture provides an opportunity for extension educators to engage in cross-disciplinary research and outreach programs with colleagues in agriculture and natural resources and beyond. For example, agricultural and food systems can no longer be separated from the fight against HIV/AIDS, global warming, and even gender issues. Thus, organic farming could be the avenue extension educators need to promote holistic development by facilitating collaboration across ministerial and nongovernmental sectors.

Finally, organic farmers’ concern that extension educators may not know enough about organic agriculture to be of help deserves serious attention. Universities offering degrees in extension should examine the extent to which organic or
sustainable agriculture is incorporated in the curriculum. For example, Cornell University, USA, has found it necessary to establish a degree program in sustainable agriculture. This is an example other universities can emulate.

In summary, although this was a relatively microscopic study of a small group of organic farmers in Ohio, it offers lessons, particularly for small farmers in developing countries who have relatively small farm sizes, face problems of environmental degradation and lack the wherewithal to purchase chemical fertilizers. To them, the principles of organic farming carefully applied, offer great promise for increasing food production and reducing mass poverty in developing countries.

References


The ‘Business’ of the Public Sector: Extension in Transition and the Balance of Powers

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Abstract
The paper addresses the public sector’s role in agricultural extension. The first part of the paper subtitled ‘Extension in Transition’ reviews the ideological and technological changes that have occurred since the 1980s and stresses the importance of educating producers and establishing a climate where they begin to organize themselves for profitable purposes. The second part of the paper subtitled ‘the Extension System as National Commitment’ examines the current reform measures affecting public sector extension and differentiates two distinct reform pathways, commercialization and democratization. Highlighted is the tension between the privatization of public sector extension systems and the call for institutional pluralism. The third part of the paper subtitled ‘Enhancing Capacities for What’ raises the question of the purpose of modern (public) extension services.

Keywords: Public Sector Extension, Agricultural Extension, Europe, Institutional Change
Introduction

At the center of this paper is the institution of agricultural extension, what in Europe is often called ‘advisory systems.’ The ‘business’ of the public sector is examined in light of government interventions aimed at reforming public sector agricultural extension. By the ‘business’ of the public sector I am referring to the public sector role in making choices and promoting changes in agricultural extension systems as well as to the programs for producers served by these systems. Forms of agricultural extension services have operated in both Eastern and Western Europe since the middle of the 19th century. In the UK the term university extension was commonly used in the 1840s (Mosher, 1976) and Cambridge University formally adopted a system for the establishment of extension centers in 1873 (Van den Ban & Hawkins, 1988). In Bulgaria the first agricultural schools were founded in 1883 and the Croatian/Slavonian Agricultural Society established eight regional extension services in 1842/43 (Zimbrek, 1997, as cited in Brent, 1999).

Introduction

Extension as a function may serve different purposes, such as information dissemination regarding health, environmental protection and conservation, industrial public relations, and education as a continuing process. Agricultural extension, as the adjective suggests, is specifically concerned with agriculture and its development. For brevity’s sake, however, agricultural extension is often referred to simply as extension.

Generally the ones who benefit most from the enhancement of the capacities of agricultural systems and producers are the consumers. Institutional and producer improvements indirectly serve to reduce prices of food and fiber products.

Formerly associated with the public sector, agricultural extension has now gone through a major transition. Today this institution tends to be broadly conceived as including “public and private sector activities relating to technology transfer, education, attitude change, human resource development, and dissemination and collection of information” (Marsh & Pannell, 1998, p. 2), as well as off-farm and on-farm players in agricultural industries. The term agricultural extension which formerly referred exclusively to the public sector is now used to include all extension-type services provided by public, private and non-governmental programs.

Agricultural extension lost momentum in the 1990s after the World Bank pulled back from the Training and Visit (T&V) Management System (Anderson, Feder & Ganguly, 2006). During the termination of T&V development, extension went adrift. With political pressures to withdraw or downsize services such as extension, several developed countries began to privatize their public sector extension systems -- e.g. The Netherlands, New Zealand, The United Kingdom, and Denmark, along with several middle-income regions and countries -- e.g., Brandenberg in Germany, Chile, Ecuador, Estonia, and South Africa (Rivera & Alex, 2005).

It soon became apparent that agricultural extension was becoming a ‘frontrunner’ (Rivera, 1999) in government efforts at public sector service reform. In the developing countries of sub-Saharan Africa, reforms affecting extension have been initiated for various purposes: to decentralize government extension services (as in Ghana), to promote demand-led projects (as in Kenya), to institute cost-recovery programs (as in Nigeria), and to privatize extension (as in Uganda).
As a result, Nagel (2005) was able to confirm that public extension was “back on the agenda.” Extension was in fact both back on the agenda and going through major transition – with calls to change some, if not all, of its purposes, direction and expertise.

Indeed, knowledge and information systems had come to be recognized as a fourth economic pillar along side those of land, labor, and capital. Knowledge is increasingly recognized as more important than physical inputs. Knowledge is what makes inputs productive and explains why some succeed where others fail, even when they have the same access or used the same amount of physical inputs (Ekboir, personal communication, October 3, 2000).

**Extension in Transition**

Extension’s purposes are changing. As Van den Ban notes (personal correspondence 28/01/2006), “if you ask farmers which information they need most, they often say information about markets; for which products and which quality of products can I get a good price, in which market and from which trader, at what time, etc.” (Van den Ban, personal communication, 2006l). A strong market orientation has taken place.

**Market Ideology**

The reforms being put in place today in their aim to increase farmer knowledge about markets are central to development. Privatization reforms result from the conservative ideology that came into being in the 1980s with President Reagan and Prime Minister Thatcher. That ideological shift represented a major reversal in development thinking from government leadership to private-sector hegemony—epitomized by the Washington Consensus (Williamson, 1989), a term used by Williamson to describe the ‘standard’ policy prescriptions he considered to be the reform package being promoted by Washington, DC-based institutions such as the International Monetary Fund, the World Bank and the U.S. Treasury Department. This new ideology initiated a transition from public-sector companies and services to private companies and services, a transition that Carney (1995) sees as going “well beyond one of privatization and entails a far more fundamental alternation of the relationship between the state and the individual, based upon a philosophy of liberalization and the primacy of efficiency” (p. 521). In essence, it was a move from the welfare state to privatization (Kamerman & Kahn, 1989). The public sector was weakened in its authority regarding products and services. Agricultural extension was debated as to whether it was economically a form of subsidy to farmers or simply a public service. It was a time heralding the privatization of information and the globalization of agricultural industry (Wolf, 1998).

As competition has increased, so has the “commodification” of agricultural knowledge and information (Buttel, 1991). Agricultural knowledge and information for production purposes came to encompass a wide range of activities in both public and private sectors. And agricultural knowledge was no longer considered a public good and free of charge. Producers began to live in a new age and a different world from that prior to the 1980s.

The ideological shift from welfare state to Washington Consensus was accompanied by other power shifts. Mathews (1996) notes national boundaries were being dissolved by inter-national electronic technology, underscoring the power shift from national limits to the modern development of telecommunications and the rapid expansion of non-state actors such as multi-national corporations. Both the ideological and e-technological developments of the past generation have
impacted extension and will continue to do so. Private-sector hegemony in agriculture and the privatization of agricultural extension systems are unlikely to abate.

**Linking Farmers to Markets**

Historically the main thrust of extension’s work has been to advance production agriculture. Recently, a shift in emphasis appears to be occurring, which places emphasis in the developing countries on linking farmers to markets -- in response to the current realities of global competition. Linking farmers to markets is not necessarily a new thrust but rather an emerging and imperative priority (Swanson, 2006). Its implication for producers, as well as for extension managers and field specialists, promises to change the content, skills and methods needed for training specialists who then become the trainers of producers (CRS/RII-CIAT, 2007). Such a shift also raises issues of producer education and establishing a climate where they see the benefits of organizing themselves. This new thrust requires specialists in marketing, processing and market information and collective action. According to Van den Ban “The need for this kind of information requires support from extension, which is very different from the support extension services provided in the past” (Van den Ban, personal communication, 2006).

Indeed, given the range of market situations it may not make sense for government to commit to any one option in advancing farmer linkages to markets. In the case of small-scale farmer development, for example, Berdegué and Escobar (2001) highlight three distinct situations among small producers: *market-driven*, where agriculture is a profitable and competitive enterprise; *market-oriented but asset constrained*, where small farmers may have incentives to embark on market-oriented agricultural innovation processes but lack the capacity to fully respond to that favorable context; and *context- and asset-constrained*, where households lack most types of assets aside from unskilled labor, and often possess very little land, minimal access to knowledge, and operate in unfavorable environments. These are important options to consider prior to committing to a market-driven option in the case of small producers (Rivera & Qamar, 2003). As Hazell et al. (2007) affirm: “Policies for smallholders need to vary by context” (p. viii).

“Extension,” according to Swanson (2006), “needs to shift some of its focus from food security to increasing farm income and rural employment” (p. 1). Swanson also maintains that for market-driven extension systems to be effective, decision-making must be decentralized. “For a decentralized extension system to be effective there must be formal stakeholder involvement in decision-making to increase accountability” (Swanson, 2006, p. 2). In this case, it is not structural decentralization being underscored but producer participation in the decision-making process. Swanson states, farmers will benefit from becoming organized into groups to achieve economies of scale in supplying high-value markets. As a result, farmer organizations become the basic building blocks of democratic institutions and will enable farmers to participate more fully in the political process (Swanson, 2006).

**Farmers’ Organization**

Farmers can benefit from group organization, which in turn can help them to become influential participants in the decision-making process of agriculture’s development and better able to establish profitable links to markets. As economist Lerman (2003) states, “In transition economies where the market environment is still underdeveloped and not fully
functional, the benefits of cooperation appear to be self-evident” (Lerman, 2003:17). However, he notes that the use of the word cooperative in Central and Eastern Europe has bad connotations, and that the old style of cooperative or collective has no relevance in the new free-market approach (Lerman, 2003). Some colleagues (e.g., Eicher, 2007; Ekboir, 2007; Ortmann & King, 2007) argue, however, that not all farmers want and will necessarily profit from association and cooperative organization. The CGIAR, World Bank, USAID and other international organizations are working to promote training programs that specify the benefits and problems inherent in farmers organizing themselves around certain specialties and value-added products other than the traditional commodities markets (Collion & Rondot, 1999).

In Central and Eastern Europe and the New Independent States (NIS) of Central Asia several governments have not yet established the necessary conditions for farmers to organize themselves. In Uzbekistan, for example, there are no self-initiated farmer organizations, and although farmers can now lease land from the government to farm, the collective-farm arrangements have not substantially changed since the demise of the Soviet Union, and are largely managed by traditional centralized means. Little has changed for the members themselves. This appears to be the case also in the Ukraine and Russia where “the majority of subsistence plots are still tied, in some way or another, to a particular collective enterprise” (Lerman & Csaki, 1998:12).

Case studies in the Royal Tropical Institute bulletin 376 (Wennick, Nederlof and Heemskerk, 2007) point out that farmers’ organizations provide research and extension services to farmers, organize the purchase of inputs and sale of products, mobilize resources, and represent the interests and provide a collective voice for farmers. In a case study from Eastern Europe in the Baltic country of Estonia, Hanna and Loolaid (2004) note that farmer organizations have been instrumental in the development of advisory services.

The Extension System as National Commitment

Today there is much talk about value chains and value-added products, all operating in a globalized marketplace. The institutional development of agricultural extension is of significance for this reason but also because it highlights different pathways in agricultural system reform and development.

Pathways in agricultural extension reform

There are at least two main and competing pathways in the reform measures being promulgated today, one toward commercialization of agriculture and the other pathway toward participation of producers and participants in the production/marketing processes. Sometimes these pathways overlap; sometimes they do not.

Privatization is the obvious example of the commercialization pathway. Decentralization is an example of promoting the participation of lower-levels of government in the nation-wide authority and budgeting of extension. Participatory and demand-led services are examples of the effort to integrate producers into agricultural decision-making processes.

Decentralization indicates the drive toward greater participation in government at lower levels of authority and within administrative services such as agricultural extension. This pathway purports to advance democratic principles of participation and one area of balance of powers. The promotion of producer participation in
extension decision-making processes is another example of this democratizing principle.

The tensions between these pathways, underscored at the 2007 18th ESEE European Seminar on Extension Education conference held in Prague (Rivera, 2007), may of course be seen as overlapping but not entirely. These tensions point up the importance that may be attributed to extension as a social technology (Cimoli et al., 2006) engaged in promoting innovative activities and distributing social skills.

Pluralism

The trend toward privatization of public sector agricultural extension services was matched concomitantly with the call for extension pluralism, which is the promotion and advancement of multi-institution, public and private (and community and NGO) extension systems. Different extension providers have distinct tendencies, except when government supplements privatized services with parallel efforts to carry out other agriculturally important tasks, such as oversight of chemicals in the environment (as in the case of The Netherlands and more recently in the U.K. Agricultural Development Advisory Service, ADAS). This call for pluralism was in some instances a response to the general thrust toward privatization.

Privatization of public-sector extension, as a reform measure, tends (but not always) to lead to a one-purpose system, not the optimality argued for by agricultural economists Hanson and Just (2001). In discussing the potential for transition to paid extension, Hanson and Just (2001) argue that “a universal movement toward paid extension is not in the public interest.” They conclude that “optimality calls for a mix of public, private, and paid extension including policy support of private extension” (5). In short, they advocate a pluralism of providers in a one-sector (agricultural) privatization system.

There appears to be agreement among professionals, but not yet among policy-makers, in favor of extension’s reform toward (multi-institutional) pluralism. The mixture of public and private extension activities exists in many countries, and no longer constitutes a new idea of the extension system (Schwartz, 1994). This introduces a serious need for coordination – “both in delivering services to clients and in arranging support for the services” (G. Alex, personal communication, June 9, 2007).

In the final analysis, it would appear that what is needed is not simply pluralism in terms of sectoral diversity but rather a multi-purposed pluralism aimed at clear-cut division of purposes and targets among the public, private and non-governmental sectors regarding agricultural issues (e.g. production, natural resource management, and the environment) as well as health, family planning, etc. Pluralism would then reflect differing agricultural and other related problems, interests and concerns. In a sense, extension pluralism would become a third pathway, combining purposes that include the trends toward both commercialization and democratization.

Enhancing capacities for what?

Both privatization and the advancement of participatory and democratic processes are important directions in the developed as well as in transitional economies and the less developing world. However, the increasing corporate hegemony globally in the food and fiber industry raises the issue of control of the world’s life industry.

Today only a few companies in seeds and processing control those markets, upwards of 60 percent. This is perhaps
inevitable in a complex globalized economic agricultural system. Given the globalization of agricultural industry, major companies with worldwide offices and facilities appear to be needed to accommodate modern agriculture. However, economists are often fixed on major commodity products, ignoring how bountiful small agriculture can be (Thompson, 1986; Rosset, 1999).

Corporate hegemony
Corporate mergers and increasing control of major parts of agriculture, what Monsanto has termed the life industry, is taking place (RAFI: online at www.RAFI.org). I have no answers to global corporate control or to the seeming inevitable factory approach to farming – given population and increasing demand for products. Rather, I simply underscore the narrowing toward a few international companies controlling seeds, processing methods, and other agricultural technologies, which is not so different except in scope of control.

From 1985 until the present, the private sector has been expanding full-tilt, producing giant transnational enterprises and retailers that basically control production and sales of commercial products for agribusiness, food and pharmacy (Genet, 1991; Heffernan 1999; Spitzer, 2003; and Hendrickson & Heffernan, 2007). Even in the food distribution area, ten firms controlled the world’s top grocery retailers in 2006, led by Wal-Mart Stores, with annual sales at $312.4 billion – more than three times more than the second retailer on the list, Carrefour (Hendrikson & Heffernan, 2007).

Five gene giants already controlled about 2/3rds of the global pesticide market, 1/4th of the commercial seed market, and virtually 100% of the genetically engineered seed market in 1999 (Heffernan). During the previous decade, the worldwide value of corporate mergers and acquisitions increased from US $462 billion in 1990 to US$3.5 trillion in 2000, roughly 12% of total world economic output (ETC Group, 2001).

The life-industry corporations are powerfully promoting the industrialization of agriculture and the advancement of the assembly-line process of food manufacturing. Private sector companies are also rapidly patenting new gene research and bioengineering technologies. They command their own agricultural information systems (Kalaitzandonakes, 1998) and the competition between companies for control of agriculturally related intellectual property is fierce.

While recognizing the importance of big industry in the global economy, the power of the corporate sector in agricultural development is obvious and both directly and indirectly affects everyday habits in eating and where and how we shop. Mass production and food chains, like supermarkets, tend to shape the way we think about food and the way we become used to factory-produced food and monolithic chains for selling it. It is not an exaggeration to say, the world has become dependent on these industries to produce and transport the food and fiber required by nations of consumers.

At the same time, the size and power of the industry alerts us to its very existence as a dominant power in society -- in agricultural development as well as politics. At the same time that we see its importance as an industry, we also note its influence on the direction of government economic politics over the past 30 years (Krugman, 2007). My own sense is that politics trumps economics, and that policy direction guides the general thrust of the economy, indeed that is the premise underlying this paper.

If market philosophy is to prevail and farmers effectively link to markets, then farmers will require the conditions and
training to help them develop a new concept of cooperation other than that they currently tend to associate with previous collectives and government cooperatives of the Soviet years. Of course, this would alter the direction and purpose of current public sector agricultural extension services.

*Government Policy*

Generally speaking, the function of public sector extension is to take action to transfer and exchange information with either a broad or narrow range of clientele (or target population). This ‘clientele’ refers to agricultural producers, rural communities, or urban populations and depends on government policy. While extension’s function may be clear, its purpose will often enough differ from country to country and even from place to place within a country. An inordinate amount of academic literature exists, including my own, arguing one way or another what extension should or should not be for any one particular purpose. Colleagues often debate whether public sector extension should promote only production agriculture, or one or all of the following: rural development through non-agricultural micro-enterprise development, sustainable agriculture and natural resource management, youth development, policy education, producer organization programs, and/or consumer protection. In some countries, Egypt for example, extension undertakes family planning as one of its purposes. Also, extension is being challenged to respond to the HIV/AIDS epidemic (Qamar, 2003).

Public sector extension is what governments want it to be. Extension is defined by policy and by the actions taken (or not taken, or inadequately performed) consequent to policy delivery (GTZ, 2001). Whether the instrument of government (or the extension agency) is capable, qualified and motivated, to carry out the government mandate is a distinct, though equally crucial question. The *realpolitik* question nonetheless is: what do governments want public sector extension to do, if anything?

While policymaking in developing countries tends to be the prerogative of central authority, in less centralized countries, as Röling and Pretty (1997) point out, it is in practice “often the net result of the actions of different interest groups pulling in complementary or opposing directions” (186). Röling and Pretty stress that the lack of interaction among citizens and the reliance by central authorities on coercion and control is the reason that so many, especially environmental, policies have failed. One example of this kind of failure occurred in Madagascar (Laub-Fischer, 2002) with a community forest project until finally the central authorities began to adopt a facilitating role, leaving ownership and management of the forest in the hands of the community.

Debate about what government *should* want extension to be and do covers a broad array of ideas and approaches. Even among those who espouse agricultural production extension, differences rage, as underlined in an earlier paper on “Global Developments Shaping Extension” (Rivera, 2001). Arguments reveal two basic and conflictive perspectives: the view that considers agribusiness as orthodoxy with tenets based on agribusiness economics (Freeman, 1989), and that which views agriculture as best understood and practiced within the context of the environment and natural phenomena (Edwards et al., 1990). Notable is the increasing number of people who are becoming concerned about agriculture from an environmental perspective, alarmed by its contribution to the degradation of the planet’s land and water resources (IAASTD, 2008).

In short, the purpose that governments propose for extension differs
widely. At the same time, governments are encouraged to consider various options regarding how its systems might perform (Rivera, Qamar, & Crowder, 2001). Ultimately, as claimed in the present paper a balance of powers is to be preferred, with various institutions contributing to the advancement of agricultural and rural knowledge.

Conclusions

Agriculture’s trend toward private sector control of the industry is also greatly impacting the public sector and its view of agricultural extension. The ideological shift from the welfare state to private-sector hegemony is evident. Technology has reduced the limitations of state frontiers. But neither shift has resulted in what was once referred to as the demise of the nation state. Indeed, the so-called demise of the nation state is grossly exaggerated. On the contrary, the state still determines what an institution such as extension will be; it determines whether, or if, agricultural extension will be privatized and whether or not a national pluralistic system will be put into place.

Throughout this presentation I stress the role of the public sector and the issues confronted in terms of privatization and the development of what I see as the more optimal system of agricultural extension. Economists, albeit with cautionary notes, are also beginning to argue for re-expansion of the role of the state as an essential ingredient in policy development, regulation and the provision of basic services, as well as in facilitating export growth (Khan, 2006). Meanwhile a plethora of reform proposals are currently impacting agricultural extension. Some are clearly directed toward democratization but most maintain a major thrust toward commercialization. And while these different pathways may be considered to be overlapping, I suggest they incorporate opposing tensions.

With respect to the emerging thrust to link farmers to markets, I think more than ever that it is important to promote education, encourage farmer organization and ensure participation of producers in agricultural processes. Farmers, especially in the developing countries, lack organization and too often have little defense against exploitation by market situations in which a few buyers control the demand from a large number of sellers. This raises the question of what capabilities do they need to protect their interests and increase their income. While this may not be the case in developed countries such as Germany, it tends to be the case in the developing countries.

But even in developed countries, agricultural producers in livestock production (especially in the poultry and hog industries), are confronted with significantly changing relationships as to their contractual relations with companies and their role in farming – whether their future points toward their continuation as independent producers or to becoming company-directed field managers? We see this in the tendency away from marketing contracts, whereby farmers previously controlled the production of products, and increasingly toward ‘production contracts’ where companies provide the inputs, processing methods, and output standards, and the farmer becomes a manager of the production system.

Agriculture is increasingly systematized which, like development in general, has advantages and disadvantages and is strongly impacting the demands on agricultural extension systems regarding efficiency and direction. As noted, the present market-oriented ideology and the advancement of e-technology are also radically affecting the priorities and promise of agricultural extension. Extension is not so much in transition as undergoing overhaul.

Ultimately my concern is with the imbalance of power that I observe currently
affecting the development of agriculture and public sector systems of extension. Just as in research we are taught to hold “doubt” as our main principle -- questioning statements that purport to be truth, so I think we must question the power relations of any one societal sector—whether government, industry or producer organizations. This conviction leads me to conclude that the real business of the public sector is ultimately to advance and maintain some sort of societal balance of powers. By balance is meant that no one sector entirely controls our future, and that extension has an important role to play in (1) the effort to link farmers to markets and (2) to provide information and group-organization knowledge to farmers with an eye to helping them to see the benefits, if they exist, of organizing into member-owned, functioning associations or groups. The expectation, or hope, is that they will then become increasingly educated to their importance for the economy and their influence on social development (World Bank, 2008).

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Armenian Agrarian Students’ Perceptions and Educational Aspirations
During Curriculum Reforms: Bologna to Yerevan

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Abstract
The 1999 Bologna Declaration signaled change for Europe’s higher education institutions. Armenia joined the movement in 2004. By the London conference in 2007, 46 ministers of education had signed a commitment to the European Higher Education Area framework with a goal of common educational currency by 2010. During the London conference, ministers voiced a need to include more student views in policy issues. Thus, Armenian State Agrarian University (ASAU) students were asked about curriculum reform issues that influence their education plans. Nine of ten students reported aspirations to study abroad and wrote the USA, France, Russia, the Netherlands, and Germany as top choices—along with 32 other countries. Half of the sample of 801 indicated advancing professional careers as a highly motivating factor for planning study abroad experiences; four in ten were motivated to learn English or another language. Pragmatically, 46% of students noted subject matter specialty as an important factor when selecting study abroad programs. Students perceived the top three challenges were economic—funding their living expenses and studies, affordable housing, and other financial constraints. These findings led to three recommendations around a central theme of engagement and dialogue. One may expect considerable interest when students are involved in meaningful ways to engage in educational policy development. Actions to facilitate student scholarships and loans and to simplify international travel, university admission, and mobility would increase students study abroad participation. ASAU students are natural allies to assist with the university’s emerging transformation into an era of knowledge exchange.

Keywords: Bologna Process, Curriculum Reforms, Student Mobility, Access, Student Perceptions, Study Abroad
Introduction

Today’s students live in a world of change—climatic, economic, educational, political, and social change. They are competing and collaborating in an emerging third era of a global knowledge economy that Friedman (2005) called “Globalization 3.0.”

Europeans first sensed a need for a shift to a more relevant university education during the early 1990s, culminating in a 29 country agreement—The Bologna Declaration of 19 June 1999. This declaration attempts to harmonize curricula design across Europe (Bologna Process, 2005; Roper, 2005; Phelan & Mulhall, 2007). Prior to the declaration, many educational institutions in Europe employed unique systems for documenting student achievement; it was difficult to compare degrees from different institutions and thus inhibited student mobility. The declaration encourages institutions to “speak the same language” with regards to degrees and student transcripts. The declaration and subsequent communiqués are well-known in higher education circles. By May 2007, 46 countries had joined the European Higher Education Area (EHEA) framework with the goal of a common educational market (London Communiqué, 2007; Bergan, 2007; South East Europe Education Cooperation Network, 2007).

Fundamentally, the primary objectives of the transformation included attracting more students to European universities (higher education institutions or HEIs) and better accommodating students in this emerging third era. University experiences must prepare students for the future—not for the past (Baumann, Bielecki, Heerens, & Lažetic, 2005; Benelux Bologna Secretariat, 2007; European student surveys on the Bologna process, 2006; Geven, 2007; McGowan, 2007). Considering these goals, there is an urgent need to adjust the curriculum to create a more contemporary sphere of learning that features quality assurance, social access, transparency, mobility, and recognition of qualifications.

Students, like other discriminating consumers, hold unique perspectives of what constitutes quality. Marmaryan, Shinn, Briers, and Galoyan (2007) posited that “quality of education is difficult to define but relatively easy to identify. Quality is measured by the product of high aspiration and satisfaction of students, stakeholders, and publics. A quality education increases the student’s knowledge, skills, and attitudes essential to perform in a changing world” (p. 26). In this new knowledge economy, students must be able to distinguish between “receiving a diploma” and “receiving a quality education.” Freeman (1997) noted that students have had limited involvement in HEI change; currently, today’s student will benefit through early engagement, public dialogue, shared viewpoints, and legitimate participation. Bergan (2003), Freeman (1997), and Roper (2005) advocated that universities recognize students as a key constituency group—thus full members in the Bologna process.

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Glanville (2006) noted that “all higher education institutions should aspire to improve and enhance the education they offer their students” (p. 49). As “insiders,” students have a unique view of university governance and hold valuable perspectives on issues such as curriculum and course development, quality of teaching and learning, student evaluation methods, performance evaluation of faculty and administrators, and various aspects of the collegiate experience (Butler, Griffith, & Kritsonis, 2007). However, European students voiced an assortment of concerns and complaints in their “Black Book” (The National Unions of Students in Europe, 2005). In particular, student authors retorted:

What seems to be the biggest problem of the Bologna Process in Iceland though, is the actual promotion of the process. The ministry of education has introduced the Bologna process to some parties involved but to a very limited extent to the students in Iceland. Their main focus seems to be professors, teachers and other HEI staff. Of the Bologna promoters in Iceland there is only one student. (p. 52)

Ideally, the student body should feel they have a voice in governance through a broad base of elected, appointed, and informal student leaders. Much of the dissention and criticism could be reduced by engaging students in early phases of the process. Formal assessment of Armenian student views will help both students and administrators determine and understand the consequences of change.

Few people of the world have experienced by those who inhabit portions of the former Soviet Union such as the Republic of Armenia. This socio-political change has resulted in a need for a “shift” in the educational perspective of the country. This shift is especially important to the Armenian State Agrarian University (ASAU). Agriculture is a major contributor to the Gross Domestic Product (GDP) of the nation. In 2005 the estimated GDP was 4.9 billion dollars (Microsoft ®, Encarta® Online Encyclopedia, 2007; United Nations Development Programme [UNDP], 2007) with agriculture comprising 24% of this total (Lerman, 2006), and employing 46% of the workforce (UNDP, 2007). Furthermore, the face of agriculture has changed dramatically in the last 18 years. According to Lerman (2006), four percent of agricultural land in the country was in individual use in 1990 whereas that number had increased to 33% by the year 2000. Due to the lack of arable land in the country (18% of all land area) (Central Intelligence Agency, 2007), the aforementioned 33% of agricultural land now in individual production translates into nearly 70% of the total arable land in the nation. This drastic change in production agriculture calls for individuals better prepared to assist those in the food and agricultural sector.

Purpose and Objectives

Tell me your dreams . . . (Sheldon, 1998)

This study asked second, third, and fourth year students engaged in a cycle one degree (bachelor’s) and graduate students engaged in a cycle two degree (master’s) about their perceptions and aspirations. Specifically, the researchers sought to determine: (1) student plans for future study abroad; (2) sources of motivation to study abroad; (3) perceived challenges associated with studying abroad; (4) factors that influence the choice of a foreign institution for study; and (5) perceptions concerning the
implementation of the Bologna process within their university.

**Methods**

Survey research methods were used to explore and describe the perceptions and aspirations of 4,349 resident undergraduate and graduate students who attended Armenian State Agrarian University (2007) in the fall of 2007. A replicated form (with minor modifications) of an English-language student questionnaire exploited five categories of European student attributes (Plompen, 2006). Questionnaire items were reviewed and validated by the research team and then translated into Armenian by an Armenian-English language specialist. A pilot-test administered on July 11, 2007, guided the development of the final instrument.

The Armenian instrument included Likert-type scale items to assess motivational factors that influence students’ decisions to study abroad, factors that influence the choice of a foreign institution for study, and perceived challenges for students associated with studying abroad. The descriptors for the “motivation” scale were “Does not motivate” (1), “Motivates a little” (2), “Motivates” (3), and “Motivates a lot” (4). The descriptors for factors that influence the choice of a foreign institution for study were: “Not important” (1), “Somewhat important” (2), “Important” (3), and “Very important” (4). The descriptors for the “difficulty” scale concerning the perceived challenges for students associated with studying abroad were: “Not difficult” (1), “A little difficult” (2), “Difficult” (3), and “Very difficult” (4). Opportunities for open-ended responses were provided for students concerning the country in which they intended to study, their decisions to study abroad, and other future plans. In addition, students were asked to respond to demographic questions concerning their sex, year of birth, degree pursued, academic status, department of study, grades, and methods of financing their education.

A single-stage cluster sample of 850 students was used to ensure representation of departments and degrees. An undergraduate departmental cluster of five or six classes included second, third and fourth year students enrolled in each of six academic departments and the agribusiness teaching centre. The undergraduate classes chosen were representative of the student body. Graduate students were enrolled through the graduate centre. Data were collected from September 24 – 28, 2007. Deans were given a written guide on the purpose and administration, including directions highlighting varying formats of the questionnaire. Professors (lecturers) administered the instrument during class time to undergraduate students in representative courses among second, third, and fourth year students. The dean of graduate studies distributed the instrument to a representative group of postgraduate students pursuing masters’ degrees, and graduate students returned their completed questionnaires to the dean’s office.

Data were analyzed using SPSS v.10 descriptive statistics, including the calculation of frequencies, percentages, means, standard deviations, and rankings. Participants’ open-ended responses were translated into English by the language specialist, and those translated comments were analyzed, summarized, and reported.

**Findings**

Of the 850 survey instruments distributed, 801 were returned (94%). The six departments within ASAU were represented by graduate and undergraduate students in the agrarian department (n=114), department of veterinary medicine and animal husbandry (n=114), department of farm mechanization and transportation
(n=126), department of land-reclamation, land tenure, and land cadastre (n=117), department of foodstuffs technologies (n=101), and students specializing in economics (n=213), which included undergraduate students in the Agribusiness Teaching Centre and graduate and undergraduate students in economics. Sixteen students did not answer the question regarding their home department. Fifty-five percent of respondents were male and 43% were female with 2% not reporting their sex; 87% of respondents were between the ages of 18 and 22 with a range of 16 to 33. The demographics of the sample were similar to the university population.

The first objective of this study was to determine the student’s plans for future study abroad. Eighty-nine percent (n=709) of students responded that they would like to study at a university outside of Armenia. When asked to list their top four choices of countries in which they would most like to study, 92% (n=740) of the students responded to the question, selecting a total of 36 different countries. When considering all choices of countries made by students, 77% (n=616) elected the USA, 76% (n=606) selected France, 43% (n=342) designated Russia, 32% (n=342) chose the Netherlands, and 26% (n=206) picked Germany. The student’s order of preference for the top five countries is presented in Table 1.

Table 1

<table>
<thead>
<tr>
<th>Country</th>
<th>1st Choice (n=740)</th>
<th>2nd Choice (n=699)</th>
<th>3rd Choice (n=669)</th>
<th>4th Choice (n=625)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>264 36</td>
<td>160 23</td>
<td>117 17</td>
<td>75 12</td>
</tr>
<tr>
<td>France</td>
<td>203 27</td>
<td>192 27</td>
<td>146 22</td>
<td>65 10</td>
</tr>
<tr>
<td>Russia</td>
<td>71 10</td>
<td>86 12</td>
<td>89 13</td>
<td>96 15</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>15 2</td>
<td>61 9</td>
<td>79 12</td>
<td>105 17</td>
</tr>
<tr>
<td>Germany</td>
<td>60 8</td>
<td>40 6</td>
<td>59 9</td>
<td>47 8</td>
</tr>
</tbody>
</table>

The second objective of the study was to determine what motivated students to study abroad. Students scored nine factors using a Likert-type scale from 1 (Does Not Motivate), 2 (Motivates a Little), 3 (Motivates), to 4 (Motivates a Lot). Half of the students (51%) reported that they were motivated a lot by the opportunity to advance their professional careers, and 43% indicated that learning another language motivated them a lot. A mean score was calculated for each factor using the above mentioned scale; results are presented in Table 2 ranked by mean score. These findings are consistent with the motivation and values for higher education by high school students in Vermont (Hochschild & Johnston, 1973) and by Russian tenth and eleventh grade students (Krutil & Fursov, 2007).
Table 2

*Factors Determining Student Motivation for Study Abroad Experience*

<table>
<thead>
<tr>
<th>Motivating Factors</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>f</td>
<td>f</td>
<td>f</td>
<td></td>
</tr>
<tr>
<td>Advancing my professional career</td>
<td>412</td>
<td>178</td>
<td>61</td>
<td>25</td>
<td>3.45</td>
</tr>
<tr>
<td>Learn English or another language</td>
<td>347</td>
<td>235</td>
<td>78</td>
<td>33</td>
<td>3.29</td>
</tr>
<tr>
<td>Overall life experience</td>
<td>300</td>
<td>250</td>
<td>79</td>
<td>34</td>
<td>3.23</td>
</tr>
<tr>
<td>Important stage in my personal development</td>
<td>322</td>
<td>237</td>
<td>77</td>
<td>47</td>
<td>3.22</td>
</tr>
<tr>
<td>Increased employability in Armenia</td>
<td>275</td>
<td>235</td>
<td>125</td>
<td>69</td>
<td>3.02</td>
</tr>
<tr>
<td>Learn more about my academic specialization</td>
<td>229</td>
<td>245</td>
<td>117</td>
<td>65</td>
<td>2.97</td>
</tr>
<tr>
<td>Opportunity to work in another country after finishing studies</td>
<td>221</td>
<td>225</td>
<td>140</td>
<td>91</td>
<td>2.85</td>
</tr>
<tr>
<td>Getting a graduate degree</td>
<td>196</td>
<td>211</td>
<td>132</td>
<td>111</td>
<td>2.76</td>
</tr>
<tr>
<td>Opportunity to live in another country/culture</td>
<td>152</td>
<td>212</td>
<td>151</td>
<td>142</td>
<td>2.57</td>
</tr>
</tbody>
</table>

In addition, the research team sought to identify factors that influence student choice of foreign study programs. Students scored 13 factors using a Likert-type scale with the following indicators: 1 (Not important), 2 (Somewhat Important), 3 (Important), and 4 (Very Important). Forty-six percent of students responded that subject matter specialty was the most influential factor in selecting a foreign study program. The factor ranked as least important was foreign study’s accessibility to Armenia, with only 10% of the students scoring it as very important. A mean score was calculated for each item using the above mentioned scale; results are presented in Table 3.
Table 3

**Factors Influencing Student Choice to Study Abroad**

<table>
<thead>
<tr>
<th>Motivating Factors</th>
<th>Very Important</th>
<th>Important</th>
<th>Somewhat Important</th>
<th>Not Important</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>The subject matter specialty</td>
<td>369</td>
<td>255</td>
<td>54</td>
<td>16</td>
<td>3.41</td>
</tr>
<tr>
<td>The university</td>
<td>274</td>
<td>304</td>
<td>76</td>
<td>29</td>
<td>3.20</td>
</tr>
<tr>
<td>The language spoken in the country and/or the university</td>
<td>272</td>
<td>300</td>
<td>94</td>
<td>23</td>
<td>3.19</td>
</tr>
<tr>
<td>Information available about the country, university, and program</td>
<td>235</td>
<td>277</td>
<td>117</td>
<td>36</td>
<td>3.07</td>
</tr>
<tr>
<td>Affordability</td>
<td>227</td>
<td>280</td>
<td>127</td>
<td>35</td>
<td>3.04</td>
</tr>
<tr>
<td>The reputation of the university</td>
<td>223</td>
<td>271</td>
<td>129</td>
<td>45</td>
<td>3.01</td>
</tr>
<tr>
<td>The country</td>
<td>248</td>
<td>255</td>
<td>129</td>
<td>72</td>
<td>2.96</td>
</tr>
<tr>
<td>The reputation of the specific program or department</td>
<td>202</td>
<td>281</td>
<td>127</td>
<td>53</td>
<td>2.95</td>
</tr>
<tr>
<td>Having friends studying at that university</td>
<td>156</td>
<td>224</td>
<td>190</td>
<td>105</td>
<td>2.64</td>
</tr>
<tr>
<td>Cultural attractions in the area</td>
<td>114</td>
<td>237</td>
<td>230</td>
<td>85</td>
<td>2.57</td>
</tr>
<tr>
<td>Having friends and family in the area</td>
<td>109</td>
<td>191</td>
<td>239</td>
<td>128</td>
<td>2.42</td>
</tr>
<tr>
<td>Weather conditions/climate</td>
<td>84</td>
<td>147</td>
<td>232</td>
<td>208</td>
<td>2.16</td>
</tr>
<tr>
<td>Accessibility to/from Armenia</td>
<td>81</td>
<td>137</td>
<td>181</td>
<td>274</td>
<td>2.04</td>
</tr>
</tbody>
</table>

The third objective of this study was to identify the perceived challenges for students associated with studying abroad. The top three challenges perceived by students were related to funding issues, with 40% of the students scoring as “very important” at least one of the three funding issues statements. A mean score for difficulty rating was calculated for each of the factors making study abroad a challenge; results are presented in Table 4. These challenges were consistent with the findings of Chumakov, Bruening, Frick, Friedel, and Moreno (2006), Wingenbach, Chmielewski, Smith, Piña, and Hamilton (2006), and Zhair (2004). During the 2007 fall term, 36% (n=287) of the students had free state tuition, 6% (n=48) had reduced state tuition, and 47% (n=372) paid full tuition. Twenty-two percent (n=175) reported receiving some financial support from home, 11% (n=89) worked part-time to help pay for their education, and 3% (n=18) used savings from previous work to help pay for their education.

The fourth purpose of this study was to identify factors that influence student
choice of a foreign institution for study. Students selected from among international and national press reports or rankings that were important when selecting a foreign university in which to apply. Thirty-seven percent of students reported that international press reports influenced their selection of a foreign university, and 25% reported that Armenian press reports influenced their selection. Half of the students (49%) responded that they were not aware of reports or rankings or they had no interest in them.

Table 4

Factors Challenging (Making Difficult) the Study Abroad Experience

<table>
<thead>
<tr>
<th>Challenging Factors</th>
<th>4 Very difficult</th>
<th>3 Difficult</th>
<th>2 A little difficult</th>
<th>1 Not difficult</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding your living expenses and studies during the study abroad</td>
<td>249</td>
<td>211</td>
<td>130</td>
<td>51</td>
<td>3.03</td>
</tr>
<tr>
<td>Finding affordable and adequate housing</td>
<td>163</td>
<td>225</td>
<td>160</td>
<td>64</td>
<td>2.80</td>
</tr>
<tr>
<td>Other financial constraints</td>
<td>147</td>
<td>206</td>
<td>167</td>
<td>63</td>
<td>2.75</td>
</tr>
<tr>
<td>Being allowed to study abroad by your present university</td>
<td>121</td>
<td>216</td>
<td>193</td>
<td>89</td>
<td>2.60</td>
</tr>
<tr>
<td>Finding admission or being accepted where I want to study</td>
<td>85</td>
<td>243</td>
<td>227</td>
<td>73</td>
<td>2.54</td>
</tr>
<tr>
<td>Paperwork required for studying in another country</td>
<td>94</td>
<td>170</td>
<td>209</td>
<td>129</td>
<td>2.38</td>
</tr>
<tr>
<td>It would be difficult for me to leave Armenia and/or my family for a long period of time</td>
<td>138</td>
<td>116</td>
<td>183</td>
<td>183</td>
<td>2.34</td>
</tr>
<tr>
<td>Dealing with the language barrier</td>
<td>55</td>
<td>194</td>
<td>306</td>
<td>109</td>
<td>2.29</td>
</tr>
<tr>
<td>Transferring course credits</td>
<td>55</td>
<td>145</td>
<td>246</td>
<td>141</td>
<td>2.19</td>
</tr>
<tr>
<td>Time required to make all the preparations</td>
<td>37</td>
<td>151</td>
<td>229</td>
<td>166</td>
<td>2.10</td>
</tr>
<tr>
<td>It is stressful to prepare, organize, and implement</td>
<td>48</td>
<td>102</td>
<td>220</td>
<td>230</td>
<td>1.95</td>
</tr>
<tr>
<td>My family makes it difficult for me to consider the opportunity (they don’t want me to leave)</td>
<td>85</td>
<td>84</td>
<td>155</td>
<td>271</td>
<td>1.97</td>
</tr>
<tr>
<td>I may lose opportunities in Armenia if I leave for a year</td>
<td>35</td>
<td>65</td>
<td>134</td>
<td>365</td>
<td>1.62</td>
</tr>
<tr>
<td>It is not about the difficulties, I am simply not interested in studying abroad</td>
<td>19</td>
<td>28</td>
<td>43</td>
<td>157</td>
<td>1.63</td>
</tr>
</tbody>
</table>
Student perceptions regarding the implementation of the Bologna process within the university framed the fifth research objective. Among the 801 respondents, half of the students (48%) were not aware of the Bologna process while half (49%) were somewhat aware or very aware of the Bologna process. This finding is consistent with that of Place, Irani, Friedel, and Lundy (2004). A related question, then, asked students about their perceptions concerning ASAU’s progress in the Bologna process. Of the 533 who responded, half perceived that little or no progress had been made regarding the Bologna process, and the other half perceived that some or much progress had been made (Table 5).

### Table 5

<table>
<thead>
<tr>
<th>Student Perceptions Concerning Progress of Bologna Process</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much progress has been made and almost completed</td>
<td>37</td>
<td>7</td>
</tr>
<tr>
<td>Some progress has been made but a little work remaining to be done</td>
<td>230</td>
<td>43</td>
</tr>
<tr>
<td>Little progress has been made but much work remaining to be done</td>
<td>156</td>
<td>29</td>
</tr>
<tr>
<td>No progress has been made and a lot of work remaining</td>
<td>110</td>
<td>20</td>
</tr>
</tbody>
</table>

Students responded that when finishing their bachelors’ degrees, more than four in 10 (43%) of them intended to study for an advanced degree in Armenia while nearly one in three (31%) planned to study for an advanced degree in another country. Thirty-seven percent of students responded that they will start work after graduation and consider an advanced degree in the future. One in ten students planned to start working in Armenia without considering further studies, and another 10% planned to enter military service.

When completing their masters’ studies, about one in five students (20%) planned to change universities and two of every five students (38%) planned to change countries as they continue their education. One in four students (25%) surveyed have applied or plan to apply for mobility scholarships, 35% were not interested, and more than one in four (27%) were not aware of the mobility scholarships as a part of the Bologna process.

### Conclusions, Recommendations, and Implications

We—like Sidney Sheldon—asked a cast of characters to tell us their dreams. Students told eclectic stories as idealists, pragmatists, and realists. As idealists, they wrote about dreams for foreign study in one of 36 countries and topped their choices in North America (USA), Western Europe (France, the Netherlands, and Germany), and Eastern Europe (Russia). As pragmatists, they wrote about advancing their professional careers and the importance of subject matter, language, and the reputation of the university in career decisions. They were more swayed by recommendations by friends and family than by international rankings and reports. As realists, they recognized tough financial challenges in funding their dreams and a plethora of bureaucratic processes. As pre-Soviet Union dissolution twenty somethings—born between 1980 and 1988 when Armenia was a part of the USSR—
these students were no strangers to political, social, economic, educational, or climatic change. Yet they were assertive and optimistic about their educational future.

**Recommendations**

Although Ghemawat (2007) argued that the world isn’t quite flat, 1) ASAU students should be recognized as a constituency group with a voice in the transformation of curriculum to accommodate an emerging third era of a global knowledge economy; students appear to be ready to give an opinion about university policy and procedures. 2) Many times, early adopters and early majority emerge as elected, appointed, and informal leaders (Rogers, 2003). Engaged student leaders can influence the direction and speed of HEI change. By their involvement in meaningful dialogue of the Bologna Process, ASAU students will feel that their contributions are valued and will take ownership in the transformation. 3) Engagement of students should be organized around multiple strategies including formal and informal activities. McGowan (2007) posited “in a world that continues to move rapidly toward globalization, it is important for students to expand their global awareness and gain international experience” (p. 61). Recommendations for engagement are consistent with those of Bergan (2007), Lewis and Niesenbaum (2005), and Roper (2005). Carlile and Christensen (2004) would likely recommend continued research and theory building by faculty members through descriptive observation, categorization, and association.

**Implications**

Given ASAU student perceptions and aspirations coupled with a coherent literature base, the research team drew five implications for action: 1) To realize their dreams, students need factual information about the megatrends that are shaping the global knowledge economy, particularly with respect to the Bologna process and the European Higher Education Area. 2) Actions to facilitate student loans and scholarships, especially for study abroad, will help students realize their dreams. 3) Simplification is necessary to facilitate international travel, admission to foreign universities, and student mobility. 4) Engagement of constituency groups in change processes is fundamental. Studies show that organizational change is most associated with universities which engage constituency groups. These same universities demonstrate the most functional autonomy in governance. 5) In this emerging era of a global knowledge economy, students hold unique perspectives of what constitutes quality. Rather than waiting for the world to change (Mayer, 2006), today’s students will bring an active voice for tomorrow’s positive change.

**References**


The Farmer Field School in Senegal: Does Training Intensity Affect Diffusion of Information?

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Abstract
Recent research on the Farmer Field School (FFS) approach in agriculture in developing countries has shown that FFS training has increased the knowledge (and in some cases) performance of trained farmers. However, several researchers found that the economic impacts of this concept and especially the knowledge diffusion effects from trained to non-trained farmers might not justify the high costs of this approach. Based on a study in Senegal in 2004, the authors hypothesized that training intensity is vital when analyzing knowledge-diffusion effects of FFS in Africa. OLS and logistic models are applied in order to identify the impact of training intensity on diffusion of information from FFS participants to non-participants. Results showed that the share or percentage of trained farmers in a community is a decisive factor for diffusion of information. The results of this study have implications for defining a critical mass of trained farmers per village to attain effective dissemination of information and to generate positive stimuli for adoption and learning among non-participants of FFS. The methodology developed for this paper is believed to be innovative and sound and the results can contribute much to a better understanding of Farmer Field Schools as an extension tool in developing countries.

Key words: Farmer Field School, Diffusion, Agricultural Extension, Africa
Introduction

The concept of Farmer Field Schools (FFS) was subject to numerous impact-assessment studies in the recent past. First developed in the 1980s by the FAO in Indonesia for the promotion of integrated pest management (IPM), it was considered to be an effective tool to extend knowledge to farmers (Pontius, Dilts & Bartlett, 2002). Recent research in Latin America and South East Asia has shown that FFS helps to increase farmers' knowledge (Godtland, Sadoulet, de Janvry, Murgai & Ortiz, 2004; Mancini, 2006; Reddy & Suryamani, 2005), and that knowledge on IPM is disseminated to non-participants (Mauceri, 2004; Ricker-Gilbert, 2005; Yamazaki & Resosudarmo, 2006). Also studies in several Asian countries demonstrated that FFS can be effective in reducing the excessive use of chemical pesticides (e.g., Mancini, 2006; Praneetvatakul & Waibel, 2003, 2006; Tripp, Wijeratne & Piyadasa, 2005; Walter-Echols & Soomro, 2005; Winarto, 2004).

However, the expected economic benefits are not always unambiguously ascertainable as shown for example by a study by Feder, Murgai and Quizon (2002) in Indonesia. In particular, doubts were raised regarding the expected diffusion effects of knowledge from trained farmers to non-participants, which are essential for achieving large-scale impact of FFS (Feder, Murgai & Quizon, 2004; Rola, Jamias & Quizon, 2002).

While much of the investment in FFS has taken place in Asia, more recently, FAO has introduced IPM FFS in Africa. The introduction of IPM FFS in Africa has shown that there are broader agronomic, management, and production issues that have to be addressed by the facilitators. This has led to the use of the term IPPM (integrated production and pest management) instead of IPM. Hence, the term, IPPM, is used in the succeeding text.

Some analysts have questioned such technology-transfer activities from a strategic point of view as being too costly and inappropriate for African conditions (Eicher, 2003). Empirical studies on diffusion of innovations and knowledge in agriculture show that diffusion (the terms diffusion, dissemination, information sharing, or transmission of information, are used as synonyms in this paper) is a complex process, which depends on multidimensional, interrelated factors (Fuglie & Kascak, 2001; Palis, Morin & Hossain, 2002; Röling, 1988; Rogers, 2003). It was shown that interpersonal networks are the predominant method by which farmers acquire knowledge (Birkhaeuser, Evenson & Feder, 1991; Rola et al., 2002; Tripp et al., 2005). Thus, psychosocial determinants play an important role for the flow of information in a community. The investigation by Palis et al. (2002) in the Philippines showed that family relations and farm neighborhood compose homophilous social clusters, which offer good conditions for spontaneous diffusion of FFS knowledge. Homophily is the degree to which a pair of individuals is similar. The similarity may be in certain attributes, such as beliefs, education, or social status (Rogers, 2003). According to Rogers (2003), communication is more effective if individuals have much in common.

The basic question of knowledge transfer is whether it is determined by the intrinsic characteristics of knowledge alone (e.g., the complexity or the abstract nature of IPM knowledge) or whether it is rather dependent on the type of farmers selected for training and the number of farmers trained. For example, the strategy of FFS placement in the context of a national program could be an important factor for the diffusion of knowledge transferred to the
When implementing a development program, agricultural administrators often try to cover large geographical areas in order to increase visibility and impact. This has also been the dominant strategy in the Indonesian IPM FFS program, where project leaders needed to present quantified achievements at the national level for the purposes of internal reporting and disbursement of funds. In a World Bank-financed project in Indonesia, up-scaling of FFS was implicit in the project strategy and resulted in what was described as "an obsessive-compulsive urge to count the number of farmers trained" (Pincus, 2002, p.95). Impact-assessment reports for the Philippines (Medina & Callo, 1999) and West Africa (FAO, 2006) reveal that field schools are often equally placed over the administrative units (districts, provinces) of the country in order to achieve nation-wide impact. Consequently, the proportion of trained farmers in a given area (village, community) is often very small.

An alternative to a program-placement strategy that aims at wide coverage is to concentrate the resources on fewer villages. These sites may be selected due to their history of pest outbreaks, excessive use of pesticides, or reported problems with pesticide intoxication. FFS would here be used as a tool that is appropriate to specific conditions in specific communities (Davis, 2006). In this case, a limited project budget would be spent to train a critical mass of farmers (several FFS in one village) including follow-up training. It can be hypothesized that due to the high visibility of FFS in a village, trained farmers may have a stronger influence on non-participants, as compared to a village where only a few farmers attended a FFS, resulting in higher adoption through farmer-to-farmer communication. Hence, the question of knowledge diffusion is coupled with the question of project placement in the context of an overall extension strategy.

The paper builds upon a recently published study by Witt, Waibel & Pemsl (2006), and introduces a methodology that captures the driving forces of knowledge diffusion in agriculture in the context of an African country. It thus contributes to a better understanding of the mechanisms that determine the success or failure of FFS training and other similar knowledge-transfer approaches and provide some hints for an effective strategy of spatial placement of FFS as one option of agricultural extension in Africa.

**Purpose**

The purpose of this study was twofold: 1) to analyze the relative importance of the training intensity among the factors that influence diffusion of FFS information, and 2) to estimate to what degree those factors affect the attitude of untrained, non-FFS farmers towards IPPM. The main hypotheses of this study were therefore as follows: (1) a concentrated training effort in a village, resulting in a higher share of FFS farmers, increases the degree of information sharing, (2) the more farmers are trained in IPPM through participation in Farmer Field Schools, the more conversations and discussions are believed to be initiated on this topic in a community. The second hypothesis takes the first one as point of departure and states that the share of FFS participants as well as the degree of information sharing affects the attitude of non-participants towards IPPM. Apart from the dissemination of information by word-of-mouth, observations of IPPM practices are also supposed to play a role.

The paper is organized as follows: In the next section, the methodology used for data collection and data analysis is introduced. Section 3 presents the results, and in section 4 the findings of the study are...
summarized and conclusions and implications are discussed.

Methods

Data on demographic and social conditions, and farm- and IPPM-related issues, were collected in 2004 in the western part of Senegal. The approach used in this investigation was to compare two communities where FFS training had been conducted but where the share of trained farmers differed widely. Otherwise, the two communities chosen for the study had similar characteristics, such as ecological conditions and infrastructure or size of village. To choose the sample villages, several villages of the same climatic zone, the Niayes region, were visited, and information was gathered in group discussions with village elders and by observation. The choice was conditional on a sufficient difference in the proportion of trained farmers. Two villages (Keur Abdou Ndoye and Gollam) located at a distance of about 20 km from one another were selected, as they met the established selection criteria best. In Gollam, one FFS was conducted in 2002/2003 on IPPM in cabbage and onion. The 20 participants made up about 3% of farmers in that village. In Keur Abdou Ndoye the first FFS took place in 2000/2001. From the season of 2002/2003 on, two FFSs have been conducted every year, so that at the time of the survey, in December 2004, 105 farmers (14% of all farmers) had been trained in a total of 5 FFS on IPPM in vegetable crops.

The sampling units were contiguous household clusters (French: carré), which were randomly chosen (9 carrés for each village out of a total of 16 carrés in Keur Abdou Ndoye and 20 carrés in Gollam). A carré is a spatially separate cluster of dwellings of a large family, usually encompassing three or four generations living together. The number of households (and individuals) in a carré may vary considerably, some carrés having only 3 to 4, others up to 15 households. Within these carrés, every active farmer above the age of 15 was interviewed.

The questionnaire consists of three parts with predominantly closed questions. Part one aims at gathering some basic demographic information, part two deals with farm- and IPPM-related issues, and the third part contains questions on the social networks and information exchange. The questionnaire was translated into the local language, Wolof, by a group of 4 native speakers, and then revised by the national coordinator of the IPPM program in Senegal. The use of the Wolof-questionnaire assured the same wording of questions in every interview. Thus, failures or variations in interpretation could be prevented.

The survey was conducted with the help of an interpreter and three enumerators during three weeks, from November 25th to December 15th 2004.

The total sample size of the survey was 194 farmers in Keur Abdou Ndoye and 147 in Gollam.

Three econometric models were established, two pertaining to the first hypothesis (Models 1a and 1b), and one pertaining to the second hypothesis (Model 2). The degree of information diffusion was captured in model (1a) by the ratio of non-exposed/exposed farmers ($NEratio$). If the $NEratio$ is zero, then information about FFS has reached every farmer in that respective carré and there are no non-exposed farmers. If it's greater than 1, the share of non-exposed farmers in the carré is greater than 50%. The group of exposed farmers included all non-participants who received information on IPPM by word-of-mouth or on-farm demonstration from participants in a FFS (spill-over). We formulated a quadratic relationship between training intensity, expressed as the share of trained farmers and the $NEratio$. The $NEratio$ was used as a proxy for the intensity of exposure to FFS information. The models were estimated using Ordinary Least Squares (OLS) regression.
farmers in the carrés (percFFS), and the non-exposed/exposed ratio, thus assuming declining marginal effects of training intensity. This seems plausible as the number of potential communication contacts rapidly declines with the number of trained farmers. Thus, the estimated model on carré level is specified as

\[ NE_{ratio} = \beta_0 + \beta_1percFFS + \beta_2percFFS^2 + \varepsilon_i \]  
(Model 1a)

Another approach used to investigate the effects of training intensity was to apply a binary logistic model (1b) regressing the likelihood of being exposed to FFS-specific knowledge on percFFS. In an earlier paper on this subject, Witt et al. (2006) found a positive impact of training intensity at village level on the likelihood of exposure, assuming a linear relationship. The model used here allowed to estimate the change in the likelihood that non-trained farmers received information about IPPM, depending on the training intensity at carré level, as well as demographic variables (\(X_i\)) that control for individual-specific communication characteristics which might influence communication among farmers, such as age, gender, property status of farm, and education level. The mathematical description of the model is presented in equation 1b.

\[
\ln \frac{p(Exp = 1)}{1 - p(Exp = 1)} = \beta_0 + \beta_1percFFS + \beta_2percFFS^2 + X_i + \varepsilon_i
\]  
(Model 1b)

To test the second hypothesis, i.e. whether training intensity had an effect on the intrinsic motivation or attitude of farmers towards IPPM, a second model was estimated. It was based on the assumption that training intensity would influence the communication of FFS knowledge among farmers. In addition, it was hypothesized that the more attention an innovation receives and the more that information is exchanged through word-of-mouth and visual demonstration, the better the opinion of non-FFS farmers towards IPPM would be held. Hence, the model allows a researcher to assess the effect of training intensity and information diffusion on the attitude of non-participants towards IPPM on an individual level as formally described in equation 2.

\[
\text{Attitude} = \beta_0 + \beta_1percFFS + \beta_2percFFS^2 + \beta_3ComFreq + \beta_4Observ + \beta_5X_i + \varepsilon_i
\]  
(Model 2)

The dependent variable in model (2) is \textit{Attitude}, i.e., the subjective assessment of the benefits of IPPM by non-FFS farmers. During the interviews (exposed) farmers were asked to express their opinion of IPPM, according to the information they had received from FFS farmers, resulting in a binary variable with: 0 = negative attitude/indifference, and 1 = positive attitude. The attitude of non-participants was assumed to depend mainly on the share of FFS farmers in the carré (percFFS), as well as on the degree of oral or visual information sharing, which was captured by the frequency of communication contacts per month (ComFreq) as well as the visual observation of IPPM on the farms of FFS farmers (Observ). To control for individual differences, demographic variables (\(X_i\)) of the respondents were also included.

The methodology applied here, provides some indications on the spill over
effects of FFS for varying degrees of training intensity through farmer-to-farmer knowledge transfer.

**Results**

Table 1 shows the distribution of trained, non-trained but exposed, and non-trained and non-exposed farmers in the sample. The training intensity (percent of trained farmers) in the sampled 9 carrés in Gollam is 7.7%, and over 38% of non-trained farmers in Gollam were unaware that FFS training took place in the village (non-exposed). In Keur Abdou Ndoye, on the other hand, the share of FFS farmers in the sample is about 31% and information about FFS has spread far better in that village and reached over 97% of the non-trained farmers (Table 1).

Table 1

*Training Intensity and Exposure to FFS Information Among Non-participants by Village, Senegal, 2004*

<table>
<thead>
<tr>
<th>Village</th>
<th>Number of trained farmers</th>
<th>Number of non-trained farmers exposed</th>
<th>Number of non-trained farmers not exposed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gollam</td>
<td>11</td>
<td>81</td>
<td>51</td>
<td>143</td>
</tr>
<tr>
<td>Keur Abdou Ndoye</td>
<td>51</td>
<td>109</td>
<td>8</td>
<td>168</td>
</tr>
</tbody>
</table>

A similar pattern was also identified within the carrés. Table 2 demonstrates that the percentage of non-exposed farmers is smaller in those carrés where the share of FFS farmers is relatively high. This indicates that training intensity and exposure to information are positively correlated. Pearson and Spearman's correlation tests confirm a highly significant (p<0.01) relationship with a correlation coefficient of 0.75 and 0.76, respectively.

Further, Table 2 suggests that diffusion of information happens first and foremost within carrés. Nonetheless, farmers from carrés with no FFS participants also receive information (e.g. carrés number 6 to number 9 in Gollam).
Table 2

Training Intensity and Exposure to FFS Information Among Non-participants by Carré (in percent), Senegal, 2004

<table>
<thead>
<tr>
<th>Village</th>
<th>Nr. of carré</th>
<th>FFS (%)</th>
<th>Exposed (%)</th>
<th>Non-Exposed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gollam</td>
<td>1</td>
<td>34</td>
<td>55</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6</td>
<td>56</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>14</td>
<td>57</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>6</td>
<td>61</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>10</td>
<td>71</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>0</td>
<td>27</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>0</td>
<td>29</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>0</td>
<td>59</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>0</td>
<td>29</td>
<td>71</td>
</tr>
<tr>
<td>Keur Abdou Ndoye</td>
<td>1</td>
<td>43</td>
<td>50</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>50</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>29</td>
<td>53</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>32</td>
<td>64</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>34</td>
<td>53</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>13</td>
<td>80</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>20</td>
<td>70</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>20</td>
<td>75</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>29</td>
<td>67</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3 presents the results of model (1a), which estimates the impact of training intensity on the Non-exposed/Exposed ratio on the carré level. The goodness-of-fit of the model is high, and the coefficients of the explanatory variables are statistically significant and show a decreasing marginal effect on the dependent variable. This is in line with theoretical expectations, as the NEratio decreases on a diminishing scale.

Table 3

OLS Estimates for the Non-exposed/exposed Ratio on Carré Level, Senegal, 2004

<table>
<thead>
<tr>
<th>Coefficient β</th>
<th>Standard error</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.73</td>
<td>0.27</td>
</tr>
<tr>
<td>PercFFS</td>
<td>-0.14</td>
<td>0.04</td>
</tr>
<tr>
<td>PercFFS²</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>
If the reciprocal value of the NEratio is taken, the estimated functional relationship would be:

\[
\frac{\text{exposed}}{\text{non-exposed}} = \frac{1}{1.727 - 0.144x + 0.003x^2}
\]

where \(x\) is the share of FFS farmers per carré (percFFS). Plotting percFFS on the exposed/non-exposed ratio (Figure 1) reveals that with an increasing share of FFS farmers per carré, the ratio of exposed to non-exposed farmers increases progressively up to a training intensity of about 24%, where it becomes infinite. At this point, all farmers in the carré would have received information on IPPM. Note that the intercept of the equation is greater than zero. This can be interpreted such that diffusion of information takes place across carrés, reaching non-participants who live in carrés where no farmer was trained in IPPM FFS (e.g., carrés number 6 to number 9 in Gollam).

**Figure 1.** Graph of the functional relationship between percFFS and the exposed/non-exposed ratio, Senegal, 2004

In model (1b), the coefficients also show the expected signs (Table 4) indicating a progressive relationship between training intensity and exposure to FFS information. The coefficients of percFFS are statistically significant and the first derivation of the estimated functional relationship (Figure 2) shows that the likelihood of being exposed to FFS-related information increases progressively up to a training intensity of about 11%-12% and then reaches a maximum at about 28% (the estimated functional relationship is \(f(x) = e^{-1.657 + 0.223x - 0.004x^2}\), the first derivation is therefore: \(f'(x) = (0.223 - 0.008x) \cdot e^{-1.657 + 0.223x - 0.004x^2}\). Hence, this result indicates that investing in FFS training up to the turning point of the function (~12% share of FFS farmers) yields increasing information spill over effects. The point, where the odds ratio reaches the maximum, can be defined as the optimal training intensity, because additional FFS training no longer increases the likelihood of exposure beyond that point.
Table 4

*Binary Logistic Estimates for Likelihood of Being Exposed on Individual Level, Senegal, 2004*

<table>
<thead>
<tr>
<th></th>
<th>Coefficient $\beta$</th>
<th>Standard error</th>
<th>Significance</th>
<th>Exp($\beta$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-1.657</td>
<td>0.995</td>
<td>0.096</td>
<td>0.191</td>
</tr>
<tr>
<td>PercFFS</td>
<td>0.223</td>
<td>0.063</td>
<td>0.000</td>
<td>1.249</td>
</tr>
<tr>
<td>PercFFS$^2$</td>
<td>-0.004</td>
<td>0.002</td>
<td>0.025</td>
<td>0.996</td>
</tr>
<tr>
<td>Gender</td>
<td>0.149</td>
<td>0.425</td>
<td>0.726</td>
<td>1.161</td>
</tr>
<tr>
<td>Age</td>
<td>0.016</td>
<td>0.018</td>
<td>0.379</td>
<td>1.016</td>
</tr>
<tr>
<td>Size of carré</td>
<td>0.034</td>
<td>0.028</td>
<td>0.222</td>
<td>1.035</td>
</tr>
<tr>
<td>Property status of farm</td>
<td>1.383</td>
<td>0.579</td>
<td>0.017</td>
<td>3.987</td>
</tr>
<tr>
<td>Pseudo $R^2$</td>
<td>0.412</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>249</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Graph](image)

**Figure 2.** Graph of the functional relationship between $percFFS$ and odds ratio of being exposed to FFS information, Senegal, 2004

The results reported above support hypothesis 1, i.e., that the diffusion of information from the FFS training among non-participants in the same village/carré strongly depends on the intensity of training (percentage of farmers trained).

The second significant variable in the model ($p>0.05$) is *property status of farm*, that specifies whether the respondent is...
owner of the land, or if he/she works on land that belongs to other family members. Hence, landowners are more likely to receive information on IPPM, probably due to the fact that they are expected to benefit most of IPPM, in terms of higher revenues.

In a second step, the researchers investigated how training intensity and sharing of information affected the attitude of farmers towards IPPM (Table 5). Results showed that the intensity of training had a positive effect on Attitude. Applying the ceteris paribus conditions, the likelihood of a positive attitude increases with percFFS and reaches a maximum at a training intensity of about 24%. Hence increasing training intensity in a village or community has had therefore not only a positive effect on the diffusion of information but also on the attitude of non-participants towards IPPM. On the other hand, no significant causal relationship was found between communication frequency (ComFreq) and Attitude, indicating that oral communication was not an important determinant of attitude. The most influential variable appears to be the observation of IPPM by non-trained farmers on the neighboring fields of FFS farmers (Observ). Hence, the observation of a change in the agricultural practice of FFS farmers emerges as the most important factor for the attitude of non-participants towards IPPM. The odds ratio, which is defined as: \( \frac{p(\text{Attitude} = 1)}{p(\text{Attitude} = 0)} \) is 50.8, i.e., the likelihood of positive attitude increases by a factor of almost 51, if a non-FFS farmer witnessed the results of applied FFS knowledge on the farms of FFS participants. Hence, FFS training would be more effective in terms of farmer-to-farmer diffusion of knowledge, if a higher visibility of training results can be attained by FFS farmers. Besides, it is clear that increasing numbers of FFS farmers in a particular community would also increase the chance that non-participants would observe applied IPPM.

Table 5

| Binary Logistic Estimates of Attitude Towards IPPM |
|---------------------------------|-------|--------|--------------|-------|
| Coefficient β                    | Standard error | Significance | Exp(β)   |
| Constant                        | -5.158 | 1.423  | 0.000       | 0.006 |
| PercFFS                         | 0.139  | 0.046  | 0.002       | 1.150 |
| PercFFS²                        | -0.003 | 0.001  | 0.015       | 0.997 |
| Gender                          | -0.039 | 0.379  | 0.918       | 0.962 |
| Age                             | -0.027 | 0.015  | 0.064       | 0.973 |
| Size of carré                   | 0.058  | 0.024  | 0.014       | 1.060 |
| Property status of farm         | 0.961  | 0.411  | 0.019       | 2.613 |
| Education                       | -0.218 | 0.195  | 0.263       | 0.804 |
| Observ                          | 3.929  | 1.050  | 0.000       | 50.834|
| ComFreq                         | 0.059  | 0.038  | 0.127       | 1.060 |
| Pseudo R²                       | 0.525  |        |             |       |
| N                               | 249    |        |             |       |
The effect of age and size of carré were statistically significant, though they may be small in absolute terms. Again, the property status of farmers plays an influential role. The odds ratio is 2.6 if farmers are owners of their farms as compared to landless laborers. Thus, if farmers can expect to benefit directly from the productivity increases and other benefits of IPPM, they are more likely to develop a positive attitude than farmers whose situation would not be significantly changed, unless by better working conditions (e.g., less risk of poisoning through chemical pesticides).

**Conclusions**

The effects of higher FFS training intensity on diffusion of information and attitude of non-participants towards IPPM were analyzed. The researchers explored a cross-section data set of 18 carré in two villages in western Senegal in 2004 with different shares of farmers trained in Farmer Field Schools. The methodology presented in this paper allows some conclusions on the marginal benefits of conducting more than one FFS per community, i.e., boosting the diffusion of IPPM-related information and changing farmers' attitudes in order to achieve better and sustainable learning and adoption.

The benefits of increasing FFS training intensity and thus adopting an alternative project placement strategy (i.e., concentration on a fewer number of villages rather than covering large geographical areas) lie in two areas. First, increasing numbers of FFS farmers (possibly surpassing a certain community-specific threshold level) result in better diffusion of IPPM-related information to non-participants, which in turn might be an important factor for the adoption of IPPM. Second, there is an effect on the intrinsic motivation of non-participants, which might likewise have an influence on the adoption behavior of farmers. The results suggest that the critical mass, i.e., the minimum training intensity lies at about 5% trained farmers per carré, where the increase in likelihood of exposure accelerates and the turning point, where marginal benefits of training start declining, is approximately at 15%. All three models also reveal that the optimal training intensity in terms of diffusion of information is at about 24-28%. At that point, the exposure to information as well as the effect on the attitude of farmers reaches a maximum and declines if the share of trained farmers is further increased.

The findings of the study suggest that the success of the Farmer Field School model in terms of knowledge dissemination is dependent on the program placement strategy. Our results indicate that the approach of placing one FFS per community or village and at the same time aiming for a maximum number of locations per country or region may not be effective in achieving the objectives of this knowledge transfer approach. The often present political pressure for rapid program up-scaling, in order to achieve widespread impact and even spread of project activities for equity reasons may hence be counter-productive to and incompatible with the genuine strengths of the FFS concept. As noted by Davis (2006), the FFS approach should not be understood as an overall extension strategy. To achieve high rates of diffusion of IPPM knowledge, careful targeting of FFS projects is important.

There is a trade-off between a rather widespread placement of FFS in a country and the impact of the training provided. It was concluded that a critical mass of trained farmers is needed in order to attain effective dissemination of information and positive stimuli for adoption and learning among non-participants. Small proportions of trained farmers in a village might be
insufficient to induce change beyond the participants of the training and may even increase the likelihood of trained farmers to switch back to their old practices.

FFS is a participatory extension approach that includes a significant focus on group and individual capacity building. The longer-term empowerment goals of FFS seek to enable graduates to continue to expand their knowledge and to help others learn and to organize activities within their communities to institutionalize IPPM practices. It therefore seems reasonable to assume that training quality will be higher if a more concentrated and at the same time longer-term strategy of program placement is used. The results also lend some support to the conclusion that the strengths of FFS projects lie in their use as an intervention in special situations, concentrating efforts and resources on selected sites rather than using it as a substitute for a national extension strategy. These results are also in line with the conclusions of a study by Fleischer, Waibel & Walter-Echols (2002, 2004) who, based on comparison of cost-effectiveness of projects in Egypt, found that public investments in participatory agricultural extension can be economically justified if the target is well chosen.

Moreover, the “clustering” of FFS may have still other benefits when compared to a scattered placement of programs. The adoption of IPPM by a large proportion of farmers in a village can have complementary effects at different levels. For example, the negative externalities of pesticide spraying could diminish and the general state of the ecosystem and biodiversity could be improved. This would increase the benefits for IPPM practitioners in the proximity. Besides, an agglomeration of FFS farmers may facilitate the formation of local markets for pesticide-reduced, pesticide free or even organic products, commercialization of bio-pesticides, and may lower the costs of introducing other institutional and technical innovations.

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Private Sector Involvement In Agricultural Extension Service Delivery in Mali: Views and Constraints from the Pilot Phase

Mercy Akeredolu, Institute of Rural Polytechnic, University of Mali

In Mali like in some other African countries, privatisation is emerging as an important factor to cut down Government expenses. Majority of the farmers (medium scale) and extension personnel favour private agency involvement in agricultural extension service delivery; the small-scale farmers due to their level of operation do not seem to support this idea. A lot of constraints need to be overcome for successful private agency involvement in the agricultural extension delivery in Mali. Due to the socio-economic, cultural and climatic differences all over the country, a multi-private agency approach may be tried out depending on prevailing situation in each zone of the country.

Attitude of Rural and Urban Women in Bamako District and Koulikoro Region of Mali to the Use of Solar Cooker

Mercy Akeredolu, Institute of Rural Polytechnic, University of Mali
Chinagorom Onyemaechi Asinobi, Imo State University, Nigeria
Ilesanmi Yemi, Hamburg University of Technology

In spite of high rate of environmental degradation and desertification, as well as increasing costs of wood, rural and urban women in Mali still prefer wood and charcoal as cooking energy sources. Abundance of solar energy has prompted the development of the solar cooker. Its adoption among these groups of women is however, less certain because they are barely aware of it and actually, have rarely started using it. Among the key constraints to its adoption include attitude, cooking time, large family, climate and acquisition cost.
Developing Extension/Outreach Education in Tajikistan

Julie A. Albrecht, Kathleen Prochaska-Cue, S. Kay Rockwell, & Pulat A. Pulatov,
University of Nebraska-Lincoln

The University of Nebraska-Lincoln (UNL) and the Khujand branch of the Technological University of Tajikistan (KbTUT) developed a collaborative program to help build a more stable economy in Tajikistan by providing extension/outreach education. Objectives were to provide outreach programs for community members by developing an entrepreneurial center and textile museum at KbTUT and to enhance subject matter expertise and experiential training in food science and textiles, clothing and design, micro-business development, entrepreneurship, and outreach/extension education for selected KbTUT faculty/upper level students and administrators who studied at UNL. Sixteen KbTUT faculty and students participated in selected courses, workshops, and field experiences specific to food and textile entrepreneurship and the textile museum development; special educational sessions on adult education incorporated the extension education philosophy. In Tajikistan UNL faculty modeled workshops on small-scale businesses and business plan development for KbTUT faculty who are expected to teach such workshops. The KbTUT Textile Museum and the Entrepreneur Center were established. Textile Department faculty started collecting items for the Textile Museum and opened their displays to the public. Entrepreneur Center faculty held community workshops on making jam, sewing, fabric dyeing techniques, and business plan development. KbTUT faculty revised, or developed new, courses to focus on a market-based economy. KbTUT faculty easily grasped the concepts to develop a textile museum, but the entrepreneur center and extension/outreach were new concepts and presented challenges.

Push-Pull Technology and Determinants Influencing Expansion among Smallholder Producers in Western Kenya

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International Centre of Insect Physiology and Ecology, Kenya
J. A. Pickett, Rothamsted Research, UK
J. Lynam, Kilimo Trust, East Africa

Several constraints limit farm productivity among most smallholders in western Kenya. A novel integrated management system called ‘push-pull’ technology (PPT) has been developed by ICIPE and partners in mitigation. It entails inter-cropping maize with a stemborer moth repellent forage legume, silverleaf desmodium (push), and planting around the intercrop an attractive trap crop, Napier grass (pull). Striga emergence and seed bank is also significantly reduced through chemical mechanisms by desmodium root exudates. This study assessed the influence of an integrated habitat management strategy called Push-pull technology (PPT) on maize productivity and factors influencing its expansion among smallholder farmers in western Kenya. The technology significantly reduced production constraints from 17.7 to 6.4 out of 28 units, translating into 64% mitigation. In spite of this, intensification or expansion has largely been hampered by limited access to Desmodium seed for the ‘push’ component and knowledge/information on PPT. Econometric findings revealed a robust and positive effect of large households, longevity of technology use, membership in productive farmer groups and organizations and residence in medium potential areas on PPT expansion, suggesting considerable scope for the technology to contribute to food security and poverty alleviation.
These findings signal the need to strengthen both formal and informal institutions to develop desmodium seed production and market systems to help increase PPT uptake and expansion.

**Influences on Florida Agricultural Extension Agents’ Decisions to Enter into the Extension Organization**

Shannon Arnold, Montana State University
Nick Place, University of Maryland Cooperative Extension
Ed Osborne, Glenn Israel, & Saundra Tenbroeck, University of Florida

This qualitative study sought to explore and describe the career decisions of Florida agricultural extension agents. Interviews were used to investigate the positive and negative factors that affected agents’ decisions to enter into the extension organization. A purposive sample was used to select twelve agents who worked in commercial agriculture. They were identified by a panel of experts as having a dependable and respectable work reputation, and then classified into the career stages model (Kutilek, et. al., 2002). Agents participated in an in-depth interview to share their thoughts on influences that shaped their decision to pursue an extension career. Grounded theory was used as the primary data analysis method (Strauss & Corbin, 1998). From the transcribed data, the systematic process of coding was used to separate, sort, and analyze the data. Open, axial, and selective coding procedures were applied to extract meaning from the data. The constant comparison technique was also employed to identify similarities and differences of patterns found. The selective codes comprised the final categories relative to the research objectives and were used to create a grounded theory. Six selective categories emerged as the most influential factors and experiences that affected participants’ decisions to enter into an extension career. The categories were agent background, career contacts, service to agricultural community, nature of extension work, position fit, and university supported education. A concept map was created to delineate the relationships between the codes and a grounded theory was developed to explain the most significant issues and influences.

**Russian Agricultural Students’ Perceptions of Local Foods and Sustainable Agriculture: Implications for Training the Next Generation of Russian Agricultural Leaders**

Jessica M. Bagdonis & Thomas H. Bruening, The Pennsylvania State University

Low agricultural output, coupled with environmental growing restraints due to unfavorable soil, climatic and weather conditions in many agricultural zones throughout Russia and increasing consumer preferences for Western-style food products, have given rise to increasing concern about land use and the future of agricultural development in Russia. This paper examines Russian agricultural students’ perceptions regarding sustainable agriculture and attitudes towards local foods to identify implications for teaching the next generation of Russian agricultural leaders. Researchers utilized a descriptive research design. The data were collected via a survey questionnaire administered to 60 undergraduate students at the Moscow State Agroengineering University (MSAU). Results suggest that there are contradictions in students’ perceptions of sustainable agriculture and attitudes towards local foods.
Spanish for the Agricultural Industries: Lessons from an Immersion Experience

Alexander Borys & Patreece D. Ingram, The Pennsylvania State University

The number of Spanish-speaking workers continues to grow as they become a critical part of the workforce in many segments of the agricultural industries and agribusiness in the state of Pennsylvania. In fact, in some states Hispanics are viewed as the backbone of the agricultural workforce. These workers bring foreign language and cultural differences to the workplace. Colleges of Agricultural Sciences are challenged to prepare their graduates for successful management roles in the agricultural industries. Increasingly, success in these positions includes the ability to relate to and communicate with Spanish-speaking workers. This paper describes a Spanish immersion program in the College of Agricultural Sciences. The Spanish for Agricultural Industries Program (SAIP) was created due to the initiative of agricultural professors who responded to the requests and needs of the agricultural industries they work with in Pennsylvania. The program was designed within the context of the agricultural industries to teach students Spanish language skills and provide an understanding of the varied Spanish-speaking cultures. Benefits of the program were assessed by Spanish language examinations conducted by Spanish teachers in Mexico and by responses to a questionnaire administered to student participants. Recommendations are offered for strengthening this program.

An Agrarian Society’s Developing Press System: Malian Journalists’ Views on Media, Ethics, and Democracy

D. Dwayne Cartmell II, M. Craig Edwards, Shelly Sitton, & Cindy Blackwell
Oklahoma State University
James W. Hynes, Sam Houston State University
Tracy Irani, University of Florida

Fledgling democracies need a press corps that can monitor their institutions and interrogate critical issues. This study describes the perceptions of Malian journalists about their role in a democracy. Fourteen journalists who attended professional development training in the United States during July 2007 provided the data. They were chosen following an orientation in Bamako, Mali, about the training, interviews, and subsequent vetting by the U.S. Embassy. The data were collected before the training’s seminars began. Questions were asked that addressed four domains relevant to the work and behaviors of journalists as well as items that described selected personal and professional characteristics. Items were adapted from earlier work by Mwesige (2004) with Ugandan journalists. An importance scale was employed to collect data about three of the domains: “5” = “Great Importance” . . . “1” = “No Importance.” Another scale was used to assess journalists’ attitudes about the “justifiableness” of various ethical issues: “5” = “Always Justifiable” . . . “1” = “Never Justifiable.” Frequencies, means, and standard deviations were calculated and reported. Influencing public affairs was viewed as the most important aspect of their jobs. Meeting the public’s need for information was seen as the most important function of news media. Certain deceptive practices were viewed as more justifiable than behaviors related to matters of confidentiality. “Freedom of Speech and Assembly” was considered highly important in a democracy. The findings will be useful when examining the training’s impact and when planning similar professional development opportunities in the future.
Developing a Methodology  
for Assessing the Impact of Farmer Field Schools in East Africa  

Kristin Davis & Ephraim Nkonya, International Food Policy Research Institute, Ethiopia  

Although farmer field schools (FFS) have been used worldwide in extension education for almost 20 years, most studies of their impact have been limited as to scope or rigor. This paper presents a methodology for better understanding how FFS have evolved in three countries in East Africa in response to various factors, and to see what the impact of FFS has been on poverty, innovation, empowerment, gender, productivity, and sustainability of agriculture. This methodology includes both qualitative and quantitative data collection and analysis, and incorporates propensity score matching and double difference approaches to improve the design to show impact of the FFS.

Extension in Sub-Saharan Africa:  
Overview and Assessment of Past and Current Models and Future Prospects  

Kristin Davis, International Food Policy Research Institute, Ethiopia  

This paper describes the role of extension in sub-Saharan Africa, and gives a typology for types of extension, which includes the basic forms of public top-down, participatory, and private. An overview of the evidence base for successes or failures of various models is given. The current status of extension in various sub-Saharan African countries is assessed, and new models were discussed. A framework for designing and analyzing extension systems is briefly described.

Entrepreneurs Business Facts and Formal Support Utilized in Swaziland  

Marietta P. Dlamini, Micah B. Masuku, & Barnabas M. Dlamini, University of Swaziland  

The unofficial estimates of unemployment in Swaziland stood at 39%. Graduates of tertiary institutions, many of whom are unemployed, are faced with the toughest plight. Government is promoting entrepreneurship, especially in the poorer regions, to combat unemployment, poverty, HIV and AIDS, and the removed international preferential markets for established sugar and textile industries. The study was conducted to survey and describe the entrepreneurs’ business facts and their formal education and system support. The population for the study was the small and medium entrepreneurs, stratified by region and type of qualification. Sampling was representative, proportionate and systematic-random. The interview protocol used was validated with a group of enterprise educators, and data collectors were trained before deployment. The instrument used included both quantitative and qualitative measures: survey of entrepreneurs businesses and open-ended questions, analyzed using descriptive statistics and content analysis. Most important findings were: business registration were mostly in the recent 10 years; enterprises were more in services, start-up, in remote area, have good road, electricity, water, and telephone, but not adequate banks. Business education courses taken were more from a spread number of both public and private institutions. Focus of courses was more on theories. Desirable teaching approaches were not experienced. Formal business system support used was professional organizations of bankers and lawyers. Chi-square test on
business facts and formal education and system support by region and type of qualification revealed that, indeed, some business and formal education and system support variables have to be carefully considered in facilitating entrepreneurship development.

Informal Support Impact and Challenges Faced by Entrepreneurs in Swaziland

Marietta P. Dlamini, Micah B. Masuku, & Barnabas M. Dlamini, University of Swaziland

Unemployment is a great developmental challenge in Swaziland. One coping strategy is promotion of small and medium enterprises. A descriptive-survey research was conducted to determine the informal support utilized by small and medium entrepreneurs, in the four regions of Swaziland, and by type of qualification. A panel of enterprise educators before administration validated an interview protocol. Findings include: mentoring support used was more from the male group, with the experienced entrepreneurs leading. Both the male and female mentoring groups had all types of impact to SMEs: knowledge, skills, attitudes, and social, in descending values. Respondents experienced breakfast and dinner meetings attended by more male, in which topics were prominently on business development and marketing. Visits were made more by government officials, bankers, established-business owners, friends, and university students, and topics were business development, financial management, and health and hygiene. Impact of breakfast and dinner meetings and visits were similar, in the importance order of knowledge, skills, attitude, and social aspects, although the impact of breakfast and dinner meetings was slightly more on social aspects than attitude. Significant differences in informal types of support by region was that, the Lubombo and Shiselweni region groups had fewer number of SMEs who experienced mentoring and some impact as compared Manzini and Hhohho region groups. The non graduate group was fewer in number among those who experienced impact of mentoring by all categories of mentors. Fewer number of non graduates also experienced higher number of male mentors.

Characteristics of Small and Medium Entrepreneurs in Swaziland

Marietta P. Dlamini, Micah B. Masuku, & Barnabas M. Dlamini, University of Swaziland

Characteristics of small and medium entrepreneurs (SMEs) needed to be established, so that deficiencies can be addressed. A descriptive-survey was conducted, with target population of all SMEs. Sampling was representative, proportionate and systematic-random. An interview schedule containing open-ended questions was validated. Responses were analyzed using content and descriptive analysis. Personal traits reported included proactive thinking, working, and relating with people; formal education, vocational, and commercial skills; not fearful, but considerate of risks; family having had business, and urge to be independent from guardians. Role models were family members, close relatives and friends. SMEs had work or internship experience. Internal transition business-related characteristics were: had own business ideas, business was perceived needed by the community, and developed from previous exposure. Business skills were acquired from previous related jobs, and from attending business workshops. Already-available resources influenced choice of business start-up, with more in retail and agriculture. SMEs acquired business site or land in the rural area, with good infrastructure, some secured in the city but with difficulty and high cost. SMEs had been honest and fair, and conformed to ethics. External transition business-related characteristics included
perception of government assisting little, but counted on their friends and community members, and family members. Laws and procedures were reported conducive; license was easy to get, but some experienced lengthy and costly process; created jobs; re-used organic wastes, and adhered to environmental standards and conservation techniques; contributed to food security, and had in mind welfare of community with the business they started with.

**Assessing Information Sharing and Changes in Knowledge, Attitude and Skill among Farmer Field School Participants from the Commonwealth of Dominica and Trinidad and Tobago**

David Dolly, University of the West Indies, Trinidad and Tobago

This study assessed information sharing and changes in knowledge, attitude, practice and skill among participants of the first set of farmer field schools conducted in the Commonwealth of Dominica and Trinidad and Tobago. Participants were small food crop producers who work with government extension agents. Non-participants were slightly younger than participants. Most non participants did not attend because the FFS schedule competed with other commitments. All participants reported an improved knowledge of IPM topics. The majority of participants reported improvement in nine identified IPM skills. There was one skill; Keeping insect zoos which did not improve. After the FFS, the majority of participants reported minimal improvements in the practices on their farms and more respect for pesticide dangers. They recognized the use of group problem solving. There was equal support and dissent that the FFS will continue when Government’s involvement ceases. The majority of participants did not report changes in farming incomes as a result of using new FFS techniques. Half of the sample shared FFS information they learnt with one person, 27% shared with two persons, 13% shared with three, 4% shared with four and 2% shared with five. These results revisit the debate whether the FFS can be the new technology transfer medium for small producers. Like other studies there is a difference between the school’s contribution to experiential learning and its contribution to technology transfer. Caribbean practitioners will need to develop strategies which enhance the FFS to simultaneously improve experiential learning and facilitate technology transfer.

**Beliefs, Barriers, and Benefits of a Faculty Abroad Experience in Mexico**

Kim E. Dooley, Larry M. Dooley, & Gabriel Carranza, Texas A&M University

Prior research has emphasized the need for international agricultural experiences for students. However, university faculty members have the ability to greatly impact students in their preparation to be global citizens if they have participated in international experiences. Qualitative content analyses of prereflective and post-reflective questions were used in this study to determine beliefs, barriers, and benefits to participation in a faculty abroad seminar held in Mexico. The analyses of perceived change indicated that (a) contacts and interest in collaboration with Mexican institutions was not as difficult as originally thought, (b) personal relationships were critical for international collaboration, (c) Mexico’s political climate was complex, and (d) all participants had a greater appreciation of the diversity of Mexican culture after participation. Data pattern analyses revealed that (a) Hispanics gained a greater appreciation of their own history and culture, (b) non-Hispanics felt that language was a barrier, and (c) traveling was more difficult for those with families/young children. Lack of funding for travel
was a major barrier for the sustainability of long-term bi-national projects. Workload and time constraints were more common among Assistant Professors who had the added pressures of tenure and promotion. This seminar contributed to the internationalization of faculty by directly exposing them to the culture, history, government, business, and language of Mexico. Future studies to compare these results with other faculty abroad programs should be conducted.

Learning about Sustainability: The Contribution of the Global Seminar Educational Model

Dennis W. Duncan & Maria Navarro, The University of Georgia
Pavli K. Mykerezi, Virginia Polytechnic Institute and State University

Environmental sustainability issues have gained great popularity and focus on university campuses in recent years. It is increasingly common to find universities experimenting with organizational, administrative and curricular changes in the search for greater emphasis in programs supporting environmental sustainability. Steptoe (2007) states that “over 200 schools now offer either courses, certifications, concentrations, undergraduate degrees, or post-grad studies on the subject” (para. 3). One specific example of a curricular opportunity on sustainability is the Global Seminar Project (GSP) - an international collaborative effort that offers a course on environmental sustainability to undergraduate and graduate students in over 45 institutions in five continents. The primary purpose of this study was to determine whether or not GSP had been a successful educational model for learning about sustainability. To accomplish this purpose, the researchers used a modified Delphi technique as described in agricultural and extension education by Dobbins (1999), Mykerezi (2003), and the Agricultural Education Assessment Project [AEAP] (2006). Panelists reached consensus on the level of significance of 75 statements regarding strengths, weaknesses, and strategies for improvement of the model. Of these, 51 statements had a mean of 4 (agree) or higher (strongly agree) in the ratings by the panelists. The three themes that emerged in the content analysis were: 1. Global Seminar Planning Procedures and Policy, 2. Curriculum & Program Development and Teaching-Learning Process, and 3. Professional Development and Research.

The Journal of International Agricultural and Extension Education: A Ten Year Look

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Tracy Rutherford & Gary E. Briers, Texas A&M University

The Journal of International Agricultural and Extension Education (JIAEE) has been a primary outlet of international agricultural education publishing and research and activity dissemination—a claim verified in this study. The purpose of this study, which was a part of a larger study, was to assess ten-years of JIAEE to determine primary and secondary research theme areas, frequent primary and secondary research themes by year, prolific authorship, and research methods and types used, using a mixed-methods design. Analyzed in this study were 144 research articles published in JIAEE issues I and III, from 1997 through 2006. There were 27 primary research theme areas and 31 secondary research theme areas identified. The compiled list of primary and secondary research themes, and prolific themes identified by year are reported. There were 329 JIAEE authors identified, with Mohammad Chizari, Barnabas Dlamini, and James Lindner (6.3%) being the most prolific. Quantitative research methods were the most common (75.7%). The most frequent research method types were survey methods (45.8%).
Research themes appear cyclic and additional research must be completed to determine depth and research influence of the potential cycles. Researchers should consider diversifying their methodological research types beyond survey research. Results of this research should be used comparatively with research priority areas identified in the National Research Agenda: Agricultural Education and Communication 2007-2010 to determine where future research focus must be incorporated.

The Role of Extension in the Assessment Process: Identifying Production Constraints Among Arabica Coffee Producers in Eastern Uganda

J. Mark Erbaugh & Joseph Donnermeyer, The Ohio State University
Samuel Kyamanywa, Makerere University, Uganda
Patrick Kucel, Coffee Research Center, Uganda

Extension providers have an important role to play in the design and development of improved agricultural technologies by helping to assess local farmer knowledge of agricultural production, needs, and constraints. Constraint assessments are considered to be an important first step in the design and development of appropriate technological solutions for complex African farming systems that can be improved by grouping farmers who share similar production practices and problems into research domains. Working with local extension providers, the Integrated Pest Management Collaborative Research Program (IPM CRSP) conducted a baseline survey with 127 farmers producing arabica coffee (Coffea Arabica L.) on Mt. Elgon in Uganda. The main purpose of this study was to analyze farmer perceptions of primary production and pest constraints to determine an initial research and training agenda and to examine the contributions and benefits to participating extension agents. The results indicate that using coffee production zones, demarcated by elevation, as the concept for constructing domains effectively differentiated coffee production and most pest constraints. A future IPM research agenda would target coffee stem borer, berry borer, and leaf rust in the low zone; and antestia bug, lace bug, and coffee berry disease in the high zone. Future training programs would focus on insect and particularly disease identification and management. Extension agents contributed substantially to the process through their experience and knowledge of local farmers, farming systems, and markets. Through inclusion in the research process they gained additional knowledge of production constraints, their communities, and increased technological proficiency.

Incorporating Problem Solving Theory and Social Capital Theory to Improve Entrepreneurial Goal Attainment

Curtis R. Friedel & John-Paul Hatala, Louisiana State University

The purpose of this conceptual paper was to examine the theoretical underpinnings of problem solving and social capital within the context of entrepreneurial activities and develop a model to explain the phenomenon that occurs during the problem solving process. An analysis of the literature found salient themes in both problem solving and social capital theories that supported a process one may use to leverage social capital for the purpose of attaining a goal. Social capital theories discussed include Weak Tie theory, Structural Hole theory, and Social Resource theory. With regard to problem solving, Kirton’s Adaption-Innovation theory supports the model by giving explanation to finding solutions to complex problems and maintaining network dynamics.
resulting from dissimilar problem solving styles while completing the problem solving process. The literature indicates that the problem solving process of the entrepreneur provides the foundation for goal attainment. If the identified obstacles are perceived as simple to solve, the entrepreneur may work independently to attain the goal. On the other hand, a goal with a high degree of complexity may require social capital to be leveraged. Once resources have been negotiated with a contact, the entrepreneur must maintain the dynamics of the network so that work is efficiently spent on goal attainment and not on distractions due to problem solving style; despite deficiencies in communication, work and trust. It is the hope of the authors that researchers will empirically test the research proposition in this model to create better insight to how entrepreneurs make these decisions.

Factors in Participation and Non-Participation in Farmer Field Schools in Trinidad and Tobago

Samuel Goff & James R. Lindner, Texas A&M University
David Dolly, University of the West Indies

This study identifies and analyzes the factors affecting participation and non-participation in FFS in Trinidad and Tobago. The socio-demographic variables which describe FFS participants and non-participants were described. It was determined whether there is a significant relationship exists between the socio-demographic variables and participation status. In addition, it was determined whether there is a significant relationship exists between the factors that impact participation (life situation factors, institutional factors, and dispositional factors) and participation status. There was a significant difference in gender and participation status. Considering that 73.3% of participants and 92.1% of non-participants were male, MALMR should consider taking measures to increase the participation of women in FFS. There was also a significant difference in the number of family members who had participated in prior FFS and participation status. As MALMR increases the number of FFS in Trinidad and Tobago and increasing numbers of individuals have family members who participate, this will stimulate non-participating farmers to join FFS. The voluntary nature of participation in FFS necessitates that agricultural extension policymakers and practitioners give careful attention to the current patterns of participation in FFS in Trinidad and Tobago. They may employ strategies that impair or eliminate the factors leading to attrition and non-participation, thus making programs more accessible, prevent attrition, and increase participation and may decrease farmers’ expenditures on pesticides, increase income, and benefit the environment.

Perceived Barriers to the Adoption of a Web-Based Resource by County Extension Agents

Amy Harder, University of Florida
James R. Lindner, Texas A&M University

Perceived barriers may negatively affect an individual’s decision to adopt an innovation. This descriptive study determined the perceptions held by Texas Cooperative Extension county extension agents (N = 533) with regard to the potential barriers to the adoption of eXtension, a Web-based educational resource. A random sample of 237 agents was selected to complete an online survey instrument which measured their perceptions of five potential barriers: (a) concerns about time, (b) concerns about incentives, (c) financial concerns, (d) planning issues,
and (e) technology concerns. Agents tended to somewhat agree that concerns about time ($M = 4.12, SD = .87$), concerns about incentives ($M = 3.90, SD = 1.00$), planning issues ($M = 3.84, SD = .93$), financial concerns ($M = 3.77, SD = 1.01$), and technology concerns ($M = 3.66, SD = .97$) were potential barriers to adoption of eXtension. Cooperative Extension should offer technical assistance, financial assistance, and training opportunities to lessen agents’ concerns about eXtension, and positively influence its rate of adoption.

 Determining Changes in Students’ Perceptions Towards Participating in International Activities after Watching On-line Videos

Wilmara Correa Harder, Tarleton State University
Thomas H. Bruening, The Pennsylvania State University

The use of technology and gadgets in today’s society is modifying the way we communicate and gather information. Recently, on-line videos have become very popular among college students. A tremendous effort is being made by colleges of agriculture sciences to internationalize the curricula and educators and administrators struggle to promote study abroad programs among agricultural science students. This study aimed to investigate the effectiveness of on-line videos in changing students’ perceptions towards participating in international activities after watching on-line videos. Three on-line videos were developed in 2006 and these videos were posted online for student viewing. A quasi-experimental research design was used in this study. A total one hundred and fifty-six students from nine sections of the first year seminar course participated in the study. Results concluded that students possess an inaccurate perception regarding participating in study abroad program and international activities. The use of on-line videos in order to change students’ perceptions was not effective in this study. Professors and college administrators should use the results from this study to better understand the depth of the problem regarding gaining interest in international agricultural among this population of students. In the future, other technologies, such as wikis, instant messaging, and cell phones, could be explored as other ways to transfer information regarding international programs and modify student perceptions.

 Perceptions of Taiwanese Academics Concerning Intangible Resources of Agri-tourism Businesses

Chia-Chien Hsu & Larry E. Miller, The Ohio State University

Effective utilization of resources such as land, labor, and capital are the focal point of traditional farm management. Primarily serving as agricultural producers, traditional farm businesses are less likely to specifically address the importance of intangible resources. The management of agri-tourism businesses not only includes all elements of traditional farm management, but also requires farm operators to specifically address the importance of intangible resources. Since agri-tourism businesses are characterized as being both agricultural producer and service provider, the act of acknowledging, acquiring, utilizing, and accumulating intangible resources in a sustainable manner for the purpose of being competitive and profitable in the industry is imperative. The purpose of this study was to identify the roles of intangible resources related to the management of agri-tourism businesses in Taiwan. A three-round, modified Delphi techniqe was employed. The findings revealed that, among the competency-based intangibles articulated by the panelists,
providing quality services, recognizing the needs of customers, and innovating were considered to have top priorities for the sustainability of agri-tourism businesses. Among asset-based intangibles articulated by the panelists, establishing customer trust, establishing positive business reputation, and complying with sanitation regulations were considered to have top priorities for the sustainability of agri-tourism businesses. Strong consensus across the panel on both intangible resource sets indicated that agri-tourism businesses would require vigorous planning and consideration for the sustainability of such businesses.

**Extension Educators’ Perceptions Regarding the Limitations to Learning about Sustainable Agriculture**

K. S. U. Jayaratne, North Carolina State University  
Robert A. Martin, Iowa State University

It is obvious that agriculture as an industry must move toward sustainability for long-term viability. Diffusion of sustainable agricultural practices to farmers through extension education is an important task for achieving long-term viability. The effectiveness of this diffusion process depends on the extension agents’ ability to learn about sustainable agriculture and educate farmers. The purpose of this study was to identify agricultural extension educators’ perceived limitations to learning about sustainable agriculture. This was a descriptive survey research study conducted with the agricultural and natural resources extension agents in the North Central Region of the United States. The study had an 81% response rate. It was found that a lack of available time and opportunity to interact with researchers were the two most important limiting factors for extension agents to learn about sustainable agriculture. Lack of training opportunities, access to research information, clarity about the use of new agricultural technology and networking opportunities were somewhat important limiting factors in learning about sustainable agricultural practices. Lack of available time and networking opportunities were significantly greater constraints in learning about sustainable agriculture for female extension agents compared to male extension Agents. The perceived level of limiting factors did not vary with the extension agents’ levels of education or their years of experience. When educational resources and programs are designed for extension agents to learn about sustainable agriculture it is important to consider these limitations and their significance to gender differences for facilitating the teaching learning process involving sustainable agriculture practices.

**Improving the Livelihoods of Women in the Developing World: Selected Perceptions of Women’s Self-Help Groups in Western Kenya**

Billy A. Jivetti, University of Missouri-Columbia  
M. Craig Edwards, Oklahoma State University

Development specialists agree that poverty in developing countries is a multidimensional phenomenon. The United Nations (2001) reported that the poorest of the world’s poor are women. The Kenyan Government recognizes that poverty is area specific and interventions aimed at creating employment and reducing poverty must be localized. In Kenya, “women’s self-help groups” have become popular avenues through which women in rural areas complement efforts toward alleviating poverty. This study examined women’s groups (Sindikiza Maisha) in Western Kenya regarding members’ perceptions on improving their livelihoods. Semi-structured,
focus group interviews were used to collect data from 11 groups. Most groups were formed to assist HIV-AIDS-related orphans or widows. Groups expressed the need for a local trade school and supported the establishment of a mobile training unit (MTU). Policy-makers who are charged with alleviating poverty should consider the implementation of a MTU and the construction of a trade school in the Shaviringa Location.

Value of International Agricultural Exchange Programs: A Brazilian Follow-Up Study

Stephen P. Jones, Communicating for Agriculture Education Programs, Minnesota
Vinicius Dos Santos, Federal Agricultural University of Vicosa, Brazil

International agricultural education programs play an important role in providing practical agricultural training to young adults from around the world. These programs have a 50 year plus success story of meeting the objectives of the Fulbright – Hays Act of 1961 to “…increase mutual understanding between people of the U.S. and people of other countries by means of educational and cultural exchange… (U.S. Code, 1961). However, there is a current threat to the continuation of these programs due to concerns over saving U.S. jobs and threats to homeland security. It is the purpose of this paper to determine the value of agricultural educational exchange programs by surveying program alumni of the Communicating for Agriculture Exchange Program. The population being surveyed is from the Federal Agricultural University of Vicosa, in Vicos, Brazil. An analysis of the results of the survey shows that program participants gained valuable cross cultural experiences, better understanding of U.S. culture, and personal development. These values do meet the intent of the Fulbright-Hays Act of 1961. The survey results need to be shared with the U.S. State Department to provide research evidence of the exchange programs value.

Making Extension Efforts More Effective: A Case Study of Malian Shea Butter Producers

Assa Kante, Oklahoma State University
Carl G. Igo & Martin J. Frick, Montana State University

The researchers conducted an ethnographic case study in three villages in Mali (West Africa) to ascertain shea butter producers’ perceptions toward technologies that improve the efficiency of shea butter production. The study revealed that the appropriateness of time and labor saving technologies for Malian women who produce shea butter depended on: 1) the relative cost of the technologies; 2) the accessibility of information on new technologies; 3) the arduousness of the work avoided; 4) the economic status of the households and of the women’s associations; and 5) the productivity of the participants in other economic activities. The study reconfirmed the conclusions of previous researchers who noted that external technical assistance from developed countries played a vital catalytic role in upgrading traditional technologies. Nevertheless, top-down technical assistance was not the best dissemination means. Participants preferred visual aids used with producer-led training. New shea butter processing technologies were requested by participants, and an understanding of the local context for their application as well as a strong field presence of trainers during designing and testing were important for dissemination.
Globalizing 4-H Youth Development: The Michigan 4-H China Initiative

Betsy McPherson Knox & Diane Ruonavaara, Michigan State University Extension

This article introduces Michigan 4-H Youth Development’s efforts with China beginning in 1988 with an agreement to bring the Chengdu Music and Dance Troupe to the state and culminating with the first stages of the 4-H China Initiative. The Initiative promises to expand the Michigan 4-H Global and Cultural Education Program and to introduce and test a Michigan 4-H Youth Development model in China. This work explores the increasing need for and benefits of internationalizing 4-H and introduces the formation of a model for Extension to work with China especially as it pertains to rural youth. It lays out the preliminary steps to engagement including lessons learned and outlines next steps and future opportunities for engagement with China for 4-H Youth Development in the United States.

Innovation and Innovation Trajectories in Agricultural Extension Services

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Scuola Superiore Sant’Anna, Laboratory of Economics and Management (LEM), Italy

This paper addresses the question of innovations in agricultural extension services. If lots of researches have proposed qualitative or quantitative models to assess the effectiveness of extension services on innovations at farm level, there are much fewer ones about innovations in services themselves. Nevertheless, there are many changes in the technical organization of extension services: impact of new technologies of information and communication, new models of consultancy, etc. Recent developments in the field of the theory of services economics propose new tools for the description of the dynamics of innovation in agricultural extension. Based on empirical analyses of innovations in different sectors of services, a taxonomy of innovations was produced. They discriminate five kinds of innovations: innovations in the competences of advisers, innovations in the material operations linked to services, informational innovations, innovations in the treatment of knowledge, and relational innovations. The different sectors of services are characterised by different combinations of dominant innovations according to different periods of time (determining some configuration of innovations). The succession of these configurations of innovations describes some technological trajectories of innovations for services. Our aim is to test the potential of such analytical tools for the characterisation of the dynamics of innovation within agricultural extension. In this perspective, we carried an historical analysis of extension services in France, the Netherlands and Germany. The investigations show that some similarities can be found between the technological dynamics of extension services in these three European countries.
Impact of Extension Privatization on Formal or Informal Collective Procedures for the Accumulation of Knowledge: Lessons from a Comparison between South and North

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Ismaïl M. Moumouni, Rural Sociology Department, Germany

This paper addresses the consequences of the privatization of extension services on the collective procedures for the accumulation of technical knowledge in the agricultural sector. It is based on a comparison between North and South, thanks to the contributions from two disciplines: an economic institutional analysis of the agricultural knowledge system in the Netherlands, and a sociological study based on field investigations in Benin. They were focused on the contribution of extension services to the settlement and/or the dismantlement of collective actions amongst farmers or stakeholders for the production of knowledge. From a methodological point of view, we compared the outcomes of two historical analyses, based on empirical and secondary qualitative and quantitative data. Our study shows 1) that extension services played historically an important role in the settlement of collective procedures for the accumulation of knowledge; 2) that these procedures and their effectiveness highly depended on social context of rural areas and were negatively affected by the privatization of extension services. The comparison between Benin and the Netherlands highlights the fact that this deconstruction can affect the formal procedures for the accumulation of knowledge (investments in experiments, construction of data bases, etc.), as well as the informal ones (exchanges between farmers, etc.). In designing privatization reforms, it is worth planning mechanisms that could ensure such procedures, in North and South countries. In this process, it is important to take the social context specific to each country into consideration.

Developing the Role of Extension in Farm Safety and Health in Ireland

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James Phelan, University College Dublin, Ireland

The Agriculture sector in Ireland and internationally has a poor health and safety record. In Ireland, a National Initiative is in progress to develop a legal Code of Practice including a Risk Assessment document and to evaluate strategies that assist farmers to effectively complete and implement the legal requirements. This paper describes the Initiative and presents the opinions of extension agents on the utility of a pilot training course initiative for farmers on completing the Code of Practice Risk Assessment Document. It also presents agents opinions on the training they received to facilitate farmer training and estimates the level and nature of follow-up advice on safety and health provided to farmers who attended a training course. The pilot training initiative attracted high numbers of farmer participants and 89% of agents believed that farmers considered attendance at a course was worthwhile. Just 62% of agents were satisfied with the training they received with the main comment being that it was too short. A comparison found that 90% of agents who facilitated a pilot training course reported the inclusion of some aspect of health and safety in their work programme compared to 71% for non participating agents. Forty eight percent of agents expressed the view that farmers give practical farm safety and health management a low priority. The findings suggest that extension agents predominantly had a positive view of the farmer training course provided and to providing advice on safety and health but follow-up strategies are required to assist farmers to implement the required changes.
The Discontinuance of Environmental Technologies in the Humid Tropics of Costa Rica: Results from a Qualitative Survey

Melanie Miller & Matthew J. Mariola, The Ohio State University

Previous studies in the Parismina watershed, Costa Rica, have revealed a high rate of discontinuance by one-time adopters of a suite of conservation farm technologies currently promoted by EARTH University. In the case of such technologies, the environmental benefits only accrue as long as the technology is in use. Most diffusion-adoption research is concerned with the process of initial adoption or rejection of particular innovations, with very few studies concentrating on the post-adoption stage which includes the continuance or discontinuance of the innovation. The objective of this study is to investigate why some farmers discontinue previously adopted environmental technologies while others continue to use them. Our results identify two general categories of factors influencing discontinuance: 1) factors related to specific characteristics of each technology and the additional labor required to maintain them; 2) factors springing from the wider socioeconomic context such as a change in farming practices or the devolution of responsibility for maintenance to a sole individual. We conclude by offering specific suggestions to extension agencies hoping to reduce levels of innovation discontinuance.

Lessons Learned in Teaching a Graduate-level, International Extension Education Course at a Distance

Pamala Morris, Mark Russell, & Kelli Selby, Purdue University

A graduate-level “Principles of International Education and Engagement” course was designed to help extension staff and graduate students internationalize their extension program. This course has been taught for two year using a web-based curriculum and e-mail correspondence and the assignments align with extension workers’ job and community challenges. The syllabus is based upon the on-line curriculum “Strengthening Extension’s Capacity for International Engagement” developed in 2003/04 through a USDA/CSREES National Initiative to Internationalize Extension grant. The eight modules form a curriculum to develop the competence and confidence of Extension educators relevant to the changing global realities of their community. Most learners prefer face-to-face class methods so there is a need for lots of self-discipline and motivation on the part of the learner. Significant lessons learned include 1) the gap between students’ perception and reality of virtual interaction, 2) website usability, 3) visit with successful online instructors, 4) faculty must log on frequently and keep students informed, 5) keep assignments relevant to community or workplace issues, 6) be organized and to stay flexible, and 7) learning preferences are important. The selection of modules should be customized to match the program responsibilities of the educator. IP video and Vista 4 Blackboard technology may be more effective for some organizations. This course and method are effective in providing intercultural and international extension knowledge and skill development and could be incorporated into graduate degree programs in Extension education.
Impacts of Agricultural Training on Young Farmers in Uganda

Johnny Mugisha, Makerere University, Uganda
Michelle Owens, Michigan State University

The District Agricultural Training and Information Centres (DATICs) component has been providing agricultural production training, information and skills to farmers and out-of-school youths; promoting linkages between farmers, agricultural advisory services and agricultural research. To supplement the financial donor support, the DATICs have been involved in commercial production to transform into autonomous training and information centres. This was a cross-section study that involved interviews, group and key informant discussions and observations utilizing structured questionnaires. Qualitative data were analyzed by frequencies and percentages while quantitative data were subjected to a descriptive statistical analysis. A “before and after” analysis was used to compare what the graduates were doing before and after the training. From the study findings, the following recommendations could be used to address the gaps and challenges in achieving DATICs objectives: The DATICs should identify more and viable income generating avenues; There is need to design Farmer School programs and courses/modules to cater for a diversity of clients including opening up to other clients who may not be members of youth clubs but able to pay the fees.; A day-scholars option could be explored and more females should be encouraged to attend the training; The offered courses/modules could be formalized to be recognized by the Ministry of Education and Sports; and national offices need to work closely with DATICs to identify and plan viable projects/program for sustainability of the DATICs.

Using Soft Systems Methodology to Plan Advanced Academic Programs in Post-Harvest Technology in Thailand

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Sirichai Kanlayanarat, King Mongkut’s University of Technology, Thailand
Barry McGlasson, University of Western Sydney, Australia

Academic programs operate in organizational environments that are not constant and are influenced by a multitude unstructured factors characteristic of human activity. Soft Systems Methodology (SSM) (Checkland, 1981) is of potentially great significance to address complex issues in these environments, and is designed as a means of moving from finding out about a given situation to taking action to improve the problem situation. This paper reports how the Soft Systems approach was used in designing and implementing advanced degree programs in Post-Harvest Technology at King Mongkut’s University of Technology-Thonburi (KMUTT), Bangkok, Thailand. The authors describe and discuss the results obtained during each of the seven stages of the SSM process: 1. Inquire into the situation; 2. Describe the situation; 3. Define the human activity system; 4. Conceptual modeling; 5. Compare the conceptual model with the real world; 6. Debate desirable and feasible changes; and 7. Implementation. As a result of the process, a revised Master’s degree and a Ph.D. program in Post-Harvest Technology are now being implemented.
Strong Villages, Strong Country: Leadership Development of Future Farmers of Georgia Adolescents Participating in a Week-long Leadership Training Institute

Maria Navarro & John C. Ricketts, University of Georgia

Strong Villages, Strong Country is the motto for the Future Farmers of Georgia (FFG) youth organization. In an effort to assist with agricultural and youth development in the country of Georgia, FFG was established as an organization that uses the context of agriculture to build leaders that will help move the country to a new era of prosperity. One of the activities associated with this venture involves a week-long leadership training opportunity for student leaders from each school with a FFG Club. The purpose of the study was to evaluate the leadership and life skills development of FFG members as a result of their participation in this training opportunity. Specifically, the objective of the study was to determine FFG students’ gain in overall and itemized Youth Leadership and Life Skills Development (YLLSD) (Dormody, Seevers, & Clason, 1993) as a result of the program. Twenty-eight students participated in the institute and completed the YLLSD instrument. The overall YLLSD score was M = 76.18, SD = 4.45, which was indicative of high development (skill gain), with only one item, trust, showing less than a “moderate gain.” When comparing overall scores between males and females, males scored higher (N = 16, M = 79.17, SD = 4.07) than females (N = 12, M = 73.94, SD = 3.41). With the help of this study and others to come, FFG and collaborators will continue to improve the design of future leadership development training institutes for youth in the Republic of Georgia.

Armenian Faculty Members’ Perceptions of Faculty Workshops on Student Evaluation Methods

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Brian Parr, Washington County School System
Glen Shinn, Texas A&M University

Armenia’s educational structure prior to 1991 followed closely the Soviet model of government controlled curriculum and teaching methodologies. Since 1991, Armenia has been striving to reform their post-secondary education system. One such reform includes the current educational evolution occurring at the Armenian State Agrarian University (ASAU). As part of this evolutionary process of change, the (ASAU) with assistance from the United States Department of Agriculture (USDA) Foreign Agricultural Service (FAS) through the Caucasus Agricultural Development Initiative (CADI) have begun implementation of the Bologna process. As a part of this process, ASAU faculty members were provided instruction in selected effective methods of student evaluation. The multi-fold purpose of this study was to describe selected characteristics of faculty members in ASAU and to describe their perceptions concerning the “importance of” and their “ability to” perform the evaluation practices and activities presented during professional development seminars. Quantitative methods were used to collect data from 22 agricultural faculty (i.e., a purposive sample) for this descriptive study. The highest rated training topic need identified was rubric development curriculum. Faculty also indicated a need for training in summative evaluation techniques (2nd highest) and creating and designing test questions (3rd highest need). To determine if participants were self efficacious with regards to concepts in each workshop a mean score was calculated for the question “Rate your ability to
implement the concepts covered in today’s workshop.” Armenian faculty members rated themselves as between “Average Ability” and “Much Ability” with regards to the five overarching workshop topics.

**European Union Enlargement and the Central European Agricultural Sector: Have Benefits Met Expectations?**

**Patrick J. Plonski**, University of Minnesota

Were the expectations in the agricultural sectors of Poland, Hungary, and in European Union ministries met following European Union enlargement in 2004? Perceptions and expectations of stakeholders in the agricultural sectors of these three political entities were studied through qualitative case study methodologies comprised of a series of 65 individual and group interviews conducted in 2000 and 2002 prior to European Union enlargement. Following the ascension of Poland and Hungary to the European Union, follow-up interviews and economic data analysis were conducted in 2007. Data was collected in Brussels, Belgium; Rome, Italy; Washington, D.C.; and rural and urban areas throughout Poland and Hungary. Objectives were to determine expectations prior to enlargement; ascertain whether expectations were met; and determine how agricultural sectors may be enhanced through information diffusion. Prior to enlargement, Central European respondents had largely negative expectations and expressed considerable fears. Following enlargement, respondents expressed largely positive feelings. This study indicates that although there were disappointments in some areas, fears prior to enlargement were largely misguided and failed to materialize. Implications are that in future large-scale shifts in agricultural economic structures, better information could be provided to agricultural stakeholders thereby enabling improved decision-making capacity.

**Public Attitudes Towards Naturalistic and Designed Landscapes in the City of Tehran, Iran**

**Gholamreza Pezeshki Rad**, Tarbiat Modares University
**Nasser Zamani**, University of Tehran
**Rama B. Radhakrishna**, The Pennsylvania State University

In the environmental literature there is an increasing body of research on urban nature suggesting that nature has beneficial effects on human beings. However, limited research has been conducted about people’s attitudes regarding different forms of nature, especially in and around cities and urban areas. This study examined attitudes of Tehran citizens’ toward areas of naturalistic landscapes in the city of Tehran, Iran, in contrast to the designed ones. A comparative strategy was employed using a questionnaire. The population for the study included 1100 park visitors who were selected from Jamshideya, a typical naturalistic park, and Niavaran, a typical designed park. A panel of experts established face and content validity of the questionnaire. A pilot test was conducted to estimate reliability which ranged from a low of 0.83 to 0.92, indicating acceptable reliability. As perceived by respondents, most attractive features of Jamshideya Park were “trees’ arrangements”, “paved natural paths”, “grounds’ covers”, “trees’ diversity”, and “shrubs’ diversity,” while most attractive features of Niavaran Park were “lights”, grounds’ covers”, “trees’ decoration” “trees’ arrangements”, and “water
fountains”. Since both naturalistic and designed parks have some favored features for urban public, therefore it is suggested that both styles should be allowed in the city where appropriate.

**Designing Agricultural Education Systems that Promote and Prepare Entrepreneurs**

**William M. Rivera**, University of Maryland  
**Kristin E. Davis**, International Food Policy Research Institute

This paper discusses three aspects of post-secondary agricultural education and training (PSAET). The first includes definitions and the differences between the inherent characteristics of being an entrepreneur versus the particular skills that people can acquire in entrepreneurial training. The paper also discusses individual versus organizational or institutional skills, and the fact that PSAET institutions can be entrepreneurial in various ways, including the search for additional funds for development and fee-based access to intellectual activities and access to new programs. The second part of the paper reviews three PSAET leadership and professional challenges. PSAET institutions are confronting a number of challenges over and above the “obvious array,” in government policy and funding, governance, capacity building, curriculum development, institutional linkages, and physical infrastructure, equipment and technology. The final aspect is an alternative way of envisioning post-secondary agricultural education and training, one that aims to promote connections with components of workforce development and the promotion of academic and entrepreneurial skills among students and other post-secondary education program participants.

**Lessons Learned From Conducting Workshops with University Agricultural Faculty and Secondary School Agricultural Teachers in Egypt**

**T. Grady Roberts**, Texas A&M University  
**Andrew C. Thoron & R. Kirby Barrick**, University of Florida  
**Mohamed M. Samy**, Egypt Coordinator, University of Illinois at Urbana–Champaign

In July of 2007, a three–member team from the U.S. conducted a series of workshops in the Arab Republic of Egypt as part of the Capacity Building component of the AERI Linkage Project, conducted by MUCIA and the University of Illinois, and funded by USAID. The purpose of the workshops was to provide secondary agricultural teachers with the skills to implement internship experiences with their students. For the workshops, a train–the–trainer approach was taken. The purpose of this paper was to document the experiences of that team of faculty. This inquiry can provide guidance for future activities that include: (1) delivering workshops in a foreign country and/or (2) working with people from Egypt. It was concluded that the international activities conducted during this project were rewarding for all team members. We strongly encourage all faculty to consider engaging in international development activities and programs. Based on the observations and experiences, two primary recommendations are offered: (1) know the potential audience, learn the culture, and understand the local situation and (2) plan well, and be prepared to alter plans as the activity or program progresses.
A Measure of the Dependency and Scale of the Use Made by Beef Cow-Calf (Beef Suckler) Farmers on Custom-Hire in Ireland

Dermot J Ruane, University College Dublin, Ireland
Richard Fallon, H. Leahy, & Edward O’Riordan, Teagasc, Irish Agricultural and Food Developmental Authority

Research work on agricultural contractors (farm custom-hire) appears not to have kept pace with other research areas within the field of farm management. Time sheet data were collected from 115 spring calving beef suckler (cow-calf) farms (75% full time, 25% part-time) over a 12 month period. Five systems involving beef sucklers were present namely: beef sucklers only, beef sucklers and sheep, beef sucklers with sheep and arable and beef sucklers and dairy. Major contractor-based activities (with hours expended for the study) were conservation (5948), organic manure-handling (1,752), land maintenance (1151), building maintenance (1018), with hedge-cutting (450), husbandry (423), fencing (367) and fertiliser spreading (105) as less-demanded services from contractors. The most frequent visits made by contractors to farms were for organic manure handling and husbandry of between 2.3 and 6 visits per annum. Forage conservation involved the longest contractor engagement periods of duration between 19.9 and 34.5 hours per visit. Contractor visits of the shortest time occurred on farms with arable enterprises. Profit monitor analysis of suckler beef farms showed that variable costs per ha were €870 or 18% of these variable cost were expended on contractors.

Participatory Research in Latin America: Three Case Studies

Diane Ruonavaara, Michigan State University

A new paradigm of research is emerging under the rubric of participatory research. Participatory research can be seen as a response to the social, ethical and practical implications of conventional research and its seeming inability or unwillingness to deal with complex, messy, real world problems. PR is based on a set of assumptions about the nature of society and about social science research that differ significantly from more conventional research paradigms. These assumptions may be expressed in two basic and interconnected themes: the relationship between knowledge and change and the relationships among various actors engaged in the research process. This article presents three approaches to PR from both a theoretical and practical perspective and three case studies of PR done in Guatemala, Mexico, and Ecuador. The author presents lessons learned and personal insights based on experiences doing PR in these three countries.

A “Mixed Model” for Assessing Intercultural and Attitudinal Outcomes of International Service-Learning Experiences

Mark Russell & Pamala Morris, Purdue University

The purpose of this paper is to share the results of a combined qualitative and quantitative method of assessing intercultural and attitudinal outcomes of international service-learning experiences. If institutions are going to support international study abroad and extension activities on the basis of professional development and increased intercultural competencies, then methods of assessing these
impacts must be found. A USDA-CSREES project, “Strategies to Extend the Integration and Assessment of International Education in Colleges of Agriculture” enabled Purdue University to compare methods of assessment of change in leadership, intercultural skills and attitudes. The Intercultural Development Inventory® was used before the international experience to provide a self-assessment and to determine base-line sensitivity for self-selected participants. The IDI® was used three weeks after the conclusion of the experience to detect quantitative changes. Students were also asked to “preflect” what they thought was going to happen during the service-learning course and then regularly respond to guiding prompts in their assigned journaling. When similar guiding prompts are used sequentially throughout the experience, it is possible to detect very deep and personal reactions, growth or change in individual student responses. Students who self-selected this service-learning course appear to be more ethnorelative in their worldview relative to how they experience cultural difference than other students in the College of Agriculture. We will share examples of individual student responses to sequential reflective journaling prompts that show rich evidence of a student’s growth or change during and immediately after an immersion experience.

4-H Youth Travel to Puerto Rico for an Environmental Study Trip

Dixie Sandborn, Michigan State University
Elizabeth Driscoll, North Carolina State University

Twenty 4-H’ers from Michigan and North Carolina spent 9 days immersed in an environmental study of Puerto Rico within the context of service-learning. Through hands-on participation, youth worked with local organizations that were successfully contributing to solving environmental issues in their areas of the island. The youth spent time observing and performing activities that furthered their conceptual understanding of the interconnectedness of Puerto Rico’s diverse environments. Through their experiences and reflection, youth were able to recognize their own role in being able to make a difference in their communities at home.

Establishing Technical Internship Programs for Agricultural Technical School Students in Egypt

Andrew C. Thoron & R. Kirby Barrick, University of Florida
T. Grady Roberts, Texas A&M University
Mohamed M. Samy, MUCIA–AERI Linkage Project, Cairo, Egypt

The Agricultural Technical Schools (ATS) of Egypt were designed to prepare skilled workers for the agricultural economy of the country. A project funded by USAID through MUCIA was designed to prepare ATS instructors for incorporating supervised agricultural internships into their curricula. Workshops were presented, with assistance from university faculty in Egypt, on topics including the need for internships, examples that were relevant to ATS programs, planning and conducting suitable internships, and establishing internship programs and technical internship centers in each school. Workshop participants rated the workshops and materials very highly. The ATS instructors also indicated that their competency in nine areas related to internship programs had increased as a result of the workshop. The instructors indicated that future workshops and materials would be helpful to them in the areas of working with employers
and working with the students’ families in planning and conducting supervised agricultural internships.

Distinctive Characteristics of FRTEP Extension Programs on Five Indian Reservations in Arizona and New Mexico

Sabrina Tuttle, Gerald Moore, Matthew Livingston, Linda Masters, Jeannie Benally, Melvina Adolf, & Joseph Hiller, University of Arizona Cooperative Extension
Jonathan Long, U.S. Forest Service

Extension services to Native American reservations have been sporadic or nonexistent since the United States federal government established the reservations in the late 19th century. The Bureau of Indian Affairs provided extension services to some reservations, beginning with the “boss farmers” of the past, and then modern extension agents, who gave technical assistance to the tribes until the 1980s; county extension offices have also offered limited services. In 1991, with petitions from several intertribal organizations, the U.S. Department of Agriculture CSREES (Cooperative State Research and Education Extension Service) formed the Extension Indian Reservation Program, now called the Federally Recognized Tribal Extension Program (FRTEP). Native American tribes have unique cultural, geographic, and historical differences from other extension clientele, and each tribe is distinctive. This paper will explore how the culture, history, and geography have affected extension delivery methods and programming on five Indian Reservations in the FRTEP program: the Navajo Nation, the San Carlos Apache Tribe, the Colorado Indian River Tribes, the Hopi Tribe, and the Hualapai Tribe, including an explanation of effective delivery methods on the five reservations and the elements that make Indian Country extension projects and programs successful.

Testing the Market Potential for a New Value-Added Cowpea Product to Improve the Well-Being of Women Entrepreneurs in West Africa

Germaine Ibro, Ramatou Seydou, & Kaka Saley, Institut National de Recherche Agronomique du Niger
Kira Everhart-Valentin, Joan Fulton, James Lowenberg-DeBoer, & Miram Otto, Purdue University

Women street vendors are an integral part of the economy of Niger. They prepare and sell inexpensive food for passersby and use the money they make to support their families. A common product these women have traditionally made is kossaï, a nutritious, high-protein product that has been a customary food for generations. An important challenge for women street vendors is preparing the kossaï batter from whole cowpeas, as it is highly labor intensive and physically demanding. In this study, researchers conducted a direct market test in which 100 women in the city of Niamey, Niger, were given two kilograms of cowpea flour (of the coarse texture that makes good quality kossaï) to use in their daily kossaï production. The women were then surveyed to determine the quality of the kossaï produced from the flour and client responses. The women found the flour to be highly advantageous, saving them time, energy and inputs, and 79 percent reported that they would use the flour for their kossaï production if it were made available. The adoption of this new technology would have numerous effects, including
enhanced economic development of Nigerien communities, positive health and nutritional impacts, and the creation of a new sector in the value chain.

**Promoting Agriculture and Food Sustainability through Apprenticeship Programs in the Caribbean: A Case Study in Trinidad and Tobago**

Nicole Webster & Ahmed Banya, Pennsylvania State University
Wayne Ganpat, Ministry of Agriculture, Trinidad and Tobago, West Indies

The urgent need for developing nations to ensure food security has driven efforts to increase youth participation in agriculture within recent times. The Youth Apprenticeship Programme in Agriculture (YAPA) in Trinidad and Tobago is a government-sponsored programme for youth 17-25 years. It was launched in 2003 and its primary purpose is to provide an opportunity for young people to become involved in farming. It is expected that this experience will show them that farming can be pursued successfully as a career and in a business –like manner. This should have the desired outcome of increased numbers of young persons entering the agriculture sector, a necessity for sustainable agricultural development. The program is linked to overall policy goals of food security, poverty alleviation, employment and rural development. This paper assesses the YAPA and outlines key points related to challenges and success faced by the program. A mixed method approach was used to gather information. Focus group sessions were conducted with all programme coordinators and a sample of trainees. This was followed by a formal survey using a self administered questionnaire with all current trainees (n=57), a survey among past trainees (n=37) and an examination of archival data. Results were mixed and showed that the majority of trainees in the programme had positive attitudes towards agriculture. They entered the program because of their strong belief in the future of farming and to generate additional. Those trainees who had negative attitudes disrupted the programme and upset the coordinators. Results also showed that there are several shortcomings with the overall structure of the YAPA program. The government needed to be more supportive of the program and follow through with promised resources and post YAPA funding.

**An Investigation of the Farm Development Pathways and Entrepreneurial Activities Employed by Irish Farm Operators Following the Acquisition of Disability**

Shane Whelan, John McNamara, & Anne Kinsella, Teagasc
Irish Agricultural and Food Developmental Authority
Dermot J. Ruane, University College Dublin
Angela McNamara, National Rehabilitation Hospital

Internationally, farm families employ development strategies to maintain or enhance living standards following disability, often requiring assistance from agricultural extension services. The aim of this article is to identify the development pathways employed by Irish farm families following farm operator disability in addition to identifying their service/support requirements. A developed questionnaire was circulated to a self-reporting sample of farm operators reporting disability in addition to a comprehensive literature review undertaken. Results indicate that almost one in five Irish farm families report disability, primarily among farm operators and typically physical in nature. Disability is a major issue among farm households, with reliance on the traditional model of farming, despite its economic problems. Legislsative and financial
constraints often prevent intensification of production. Spouse participation in off-farm employment was the predominant income diversification strategy. One in five farm families experienced an erosion of their income base with the disengagement of off-farm employment among farm operators following disability, placing additional pressure the farm business to provide an adequate standard of living. Financial assistance in addition to advice/information were primary service/support requirements among farm operators, with the current provision of services/supports perceived largely insufficient. The results generated in this research raise awareness of issues among farm households reporting disability, and suggest that Agricultural Educators give consideration to designing holistic cooperative programmes that minimise the impact of disability among farm households.

Farmer-Interactive Learning for Improved Management Through FARMS (Farm Asset Resource Management Study) Groups: An International Perspective

John Wibberley, Royal Agricultural College, UK

The purpose of the paper is to describe the characteristics of FARMS (Farm Asset Resource Management Study) Groups and the practical factors which enable them to start and be sustained with a view to encouraging their wider adoption as a means of sustainable extension. Its objectives are to: Clarify the characteristics of FARMS Groups; Present a descriptive outline of their operation and outputs in diverse context; Discuss practical factors contributing to successful seeding and sustenance of such group; Advocate the benefits of FARMS Groups in addressing the current issues facing agriculture and their potential role in farm management and extension strategy; and Encourage promotion of FARMS Groups to enable farmers to face the challenge of improved farm-household resource management in the context of global environmental management imperatives, the global trading context and global entrepreneurship. It is the central argument of this paper that farmer-interactive learning together promotes mutuality and the scope for trust to grow among farmers. Upon this mutuality and trust, subsequent spontaneous and sustainable collaboration can be built through the decision of farmers together. Improved resource management on farms is stimulated in the process. Trust and mutuality are necessary not only for the subsequent development of various types of Farmer-Controlled Business (FCB) but also for promotion of rural community relationships.
Association for International Agricultural and Extension Education
24th Annual Conference
E.A.R.T.H. University, Costa Rica
March 9-15, 2008

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Outstanding Paper Presentation

The Discontinuance of Environmental Technologies in the Humid Tropics of Costa Rica: Results from a Qualitative Survey
Melanie Miller and Matthew J. Mariola
The Ohio State University

2nd Place Outstanding Paper Presentation

Extension in Sub-Saharan Africa: Overview and Assessment of Past and Current Models and Future Prospects
Kristin Davis, International Food Policy Research Institute

3rd Place Outstanding Paper Presentation

Farmer-Interactive Learning for Improved Management through FARMS (Farm Asset Resource Management Study) Groups: an International Perspective
John Wibberley, Royal Agricultural College

Outstanding Graduate Student Paper

Improving the Livelihoods of Women in the Developing World: Selected Perceptions of Women's Self-Help Groups in Western Kenya
Billy A. Jivetti and M. Craig Edwards
Oklahoma State University
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Outstanding Poster Presentation

Youth and Community Development in the Republic of Kyrgyzstan
Timothy K. Kock & Craig Edwards
Oklahoma State University

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Cost Efficient International Experiences for Graduate Students
David E. Lawver, Katie E. Leigh, Alyx M. Oshel, Kyle Pate, & Carols Villalobos
Texas Tech University

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Diverse Market Segments and Customer Satisfaction: Are We Serving All Clientele Well?
Glenn D. Israel, Sebastian Galindo-Gonzalez, Marna Weston, & Kathryn Israel
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Journal Article of the Year for 2007

The Editor requested board members to review and nominate articles published in Volume 14 (2007) for the sixth annual Article of the Year Award. The nomination period occurred in February 2008. Criteria for article selection and nomination were the article’s capacity for “enhancing the research and knowledge base of agricultural and extension education worldwide…”

Dr. Gary Wingenbach, Past-Editor, conducted a survey of board members, asking them to review and rank the overall excellence of each article. Following are the results of this evaluation. Congratulations to all the authors on their scholarly achievements.

Outstanding Journal Article of the Year for 2007


Runner-Up Journal Articles of the Year for 2007


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Summer 2008
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