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 environmentally 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 OEEFA, 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

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

* 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>

### Philosopher 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

<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

<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></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.62*</td>
<td>.52*</td>
</tr>
<tr>
<td>2. Support of organic farmers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.57*</td>
<td>.22*</td>
</tr>
<tr>
<td>3. Friendly service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.57*</td>
<td>.27*</td>
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<tr>
<td>4. Food safety benefits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.48*</td>
<td>.06*</td>
</tr>
<tr>
<td>5. Reasonable price</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.25*</td>
<td>.29*</td>
<td>.10</td>
<td></td>
<td>.27*</td>
<td>.17</td>
</tr>
<tr>
<td>6. Environmental benefits</td>
<td></td>
<td></td>
<td></td>
<td>.03</td>
<td>.37</td>
<td>.52*</td>
<td>.42*</td>
<td>.30*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Farmers they know &amp; trust</td>
<td></td>
<td></td>
<td>.19</td>
<td>.10</td>
<td>.16</td>
<td>.55*</td>
<td>.27*</td>
<td>.09</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8. Learn where their food comes from</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>
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<tr>
<td>9. Because organic foods are healthier</td>
<td></td>
<td>.48*</td>
<td>.32*</td>
<td>.35*</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>.53*</td>
<td>.33*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>11. Organic food is fresher</td>
<td></td>
<td>.64*</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*.

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 forgoing 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


