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

Articles intended for publication should focus on international agricultural education and/or international extension education. Articles should relate to current or emerging issues, cite appropriate literature, and draw out implications for international agricultural and extension education. **Manuscripts, 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 *Journal*: Feature Articles; Commentary Articles; Tools of the Profession Articles.

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

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

**Tools of the Profession Articles**
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 *Journal*.

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From the Editor

I extend my sincere greetings to all *Journal of International Agricultural and Extension Education* (JIAEE) subscribers and to all Association for International Agricultural and Extension Education (AIAEE) members. The fall season is upon us. I am hopeful this issue finds you excelling in your profession and content with your contributions to our Association.

This *JIAEE* issue brings many questions about our collective contributions to the greater good of the AIAEE. What have we done to advance our Association? Have we been involved actively in promoting scholarship within the AIAEE? Have we contributed time, talent, and energies into the planning of our next conference? It is easy to hold the view that a geographical distance prohibits participation in the conference planning process. But, that view is incorrect since the vast majority of our next conference is being planned electronically. In other words, if you have a valid e-mail account, then you certainly can participate as a peer reviewer of research papers, poster abstracts, and/or carousel abstracts. The same line of thinking applies to the scholarship process in the *JIAEE*; however the editorial board suggests strongly that I seek out peer reviewers who have published scholarly materials in the recent past.

I encourage you to read the inaugural contribution to our **Seminal Article Series**, an annual scholarly event designed to encourage debate within the Association. The seminal article may provide guidance in developing a future theme-focused *JIAEE* issue. Our inaugural seminal article contributor, Dr. James E. Christiansen, poses several questions to the AIAEE, which should be discussed/debated by the entire Association. In particular, we should discuss our organizational structure; is it fulfilling the original mission and purpose? Does our mission/purpose need an update? How much specificity in our research is needed to identify our Association as a highly specialized group? Do we want to be known as an Association of members with highly specialized interests in agricultural and extension education? The time is now to have open, honest discussions about these issues.

I will be the first to agree that our mission, purpose, objectives, and even our constitution and bylaws, need an update to be more reflective of current times since they are more than 20 years old. However, you should not wait for someone else to start the conversation. You can start it with a posting to the AIAEE Listserv. If you have questions about posting a topic for discussion on the listserv, do not hesitate to contact Dr. James Lindner (j-lindner@tamu.edu) or me (g-wingenbach@tamu.edu) at your convenience.

Thank you to all contributors (pp. 95-96), reviewers (pp. 97-98), and board members (pp. 2-3) who made *JIAEE* Volume 12 live up to its scholarly standards. This issue contains one seminal article, six feature articles, and one tools of the profession article, made possible through your scholarship and the untiring service of our peer reviewers. Enjoy your fall issue and continue doing what you can to promote greater understanding of agricultural and extension education worldwide.

Sincerely,

Gary J. Wingenbach, Editor
*Journal of International Agricultural and Extension Education*
Addressing the Right Issues and Raising the Right Questions in AIAEE

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Abstract
This paper presents the partial development of a theoretical base and related discussion about issues and questions that members of the Association for International Agricultural and Extension Education should address if the Association is to impact agricultural education and agricultural development in its broadest sense, both worldwide and within the nations of its respective members. Eleven postulates are presented that relate to the seven specific objectives currently stated for the Association. The postulates constitute a summary for the incomplete theoretical base that was developed. General problems or issues perceived to exist currently in 2005 are described. Questions to be considered for discussion by members and officers of the Association are identified. Five recommendations for action to provide focus and direction for the Association are presented as well as three concluding questions directed to the reader.

Keywords: Issues, Objectives, Problems, Professional Association, Theoretical Base, Vision

Acknowledgment: This paper was developed and refereed through special invitation from the JIAEE Editorial Board to initiate its inaugural “Seminal Article Series.” This paper is supported in part through State of Texas funds, and funding from the Department of Agricultural Education, Texas A&M University; it was produced, in part, through the Texas Agricultural Experiment Station, College Station, Texas.
What factor, force, item, presence, quantity, or quality exists in programs of international agricultural development and education that is consistent over time irrespective of the organizational structure or institutional setting in which people work? What affects the success or failure of those programs? It is the human element.

But do we anticipate the consequences of our actions when engaged in such programs? Have we been realistic in our endeavors? Do we exercise reasoned, thoughtful judgment resulting from knowledge and careful analysis as we undertake professional activities? We are members of a professional association, the Association for International Agricultural and Extension Education (AIAEE). Have the actions of the Association and its members been realistic, reasoned, thoughtful, and considerate as we undertake activities of the Association on behalf of its members? Have we successfully avoided this all too common organizational pitfall? Or, do we need to make some adjustments in what we do individually and collectively as a professional association? Possibly more importantly, are there issues emerging in international agricultural development that the Association should address through the collective wisdom of its members irrespective of the organizational structure or institutional setting in which the members work? If so, what can agricultural and extension educators do now? Can we remember that if we point our index finger at others and three fingers point back at us that we might involve ourselves more realistically in our profession and Association? Let us gain some insights into these questions.

First, a bit of history is in order. “The Association for International Agricultural and Extension Education (AIAEE) was established in 1984 to provide a professional association to network agricultural and Extension educators who share the common goal of strengthening agricultural and Extension education programs and institutions worldwide” (Association for International Agricultural and Extension Education, n.d., ¶ 1). Its establishment was the result of perceptions of people who had been active on the International Education Committee of the American Association for Teacher Educators in Agriculture (AATEA), now the American Association for Agricultural Education (AAAE), and the International Education Committee of the American Vocational Association (AVA) that neither organization was addressing questions across the whole spectrum of agricultural education nor taking into account the worldwide personnel, status, needs, programs, possible interactions, and opportunities in agricultural education. In short, the time was ripe for establishing an international professional organization that focused on the different knowledge bases and contextual applications constituting agricultural education.

The current specific objectives of AIAEE that evolved over time, have been subscribed to by the membership, and reflect, hopefully, the mission of the Association, are to:

1. Articulate the role of agricultural and Extension education in international agricultural development.
2. Develop state-of-the-art papers on agricultural and Extension education worldwide.
3. Establish a continuing dialogue within the profession in international agricultural and Extension education on a global scale.
4. Establish and maintain a continuing dialogue between AIAEE and donor agencies for international agricultural development.
5. Establish a roster of professionals in agricultural and Extension education who can provide the expertise needed to assist funding agencies in planning and implementing agricultural and Extension education programs and institutions in other nations.
6. Encourage research within the profession that will favorably impact on agricultural and Extension programs in countries around the world.

7. Improve the skills and knowledge of professionals who want to work in international agricultural and Extension education. (Association for International Agricultural and Extension Education, n.d., ¶ 1)

Now that 21 years have passed since the founding of the Association, should we not perform a reality check as to the degree to which these objectives are being met? Should we determine if some of these objectives are still relevant for the foreseeable future? Are there other objectives that need to be established to further the mission of the Association more effectively and more appropriately? What can agricultural and extension educators do now to enhance achieving these and possibly other objectives?

**Theoretical Base and Discussion**

Eleven postulates related to AIAEE objectives have been developed to summarize a partial theoretical base. A theoretical base can set the stage for conducting different forms of scholarship, for considering policy, for establishing direction, and for establishing points of reference. The theoretical base presented here undergirds the premise that issues exist that members of AIAEE must address if the Association, collectively, is to have an impact on agricultural development and agricultural education, both worldwide and within the nations of its respective members. The postulates are:

*Postulate 1.* Because, in other settings, it has been shown that a multiplier, compounding effect results when individuals or organizations collaborate with other individuals or organizations to pursue a common goal, it can be theorized that AIAEE would benefit from actively seeking and establishing collaborative relationships with other international agricultural development-related organizations and associations to develop such activities as joint conferences, joint programmatic initiatives, joint legislative recommendations, jointly sponsored publications, etc.

*Postulate 2.* Because the members of an effective international association focus on actions that reflect emerging trends and issues relevant to that association’s mission and thus articulate their roles in doing so, it can be theorized that AIAEE members, especially as social scientists, can undertake, promote, support, or otherwise engage in activities that relate to at least 12 of the 40 sections of Agenda 21, the United Nations plan of action for sustainable agriculture, rural development, and the environment.

*Postulate 3.* Because social scientists have undertaken such activities in other fields and because those activities have borne fruit in advancing those fields, it can be theorized that as social scientists in international agricultural and extension education we can and should undertake such efforts and that the fruit borne will advance our field also.

*Postulate 4.* It is theorized that while the nature and structure of the Association’s annual conference and articles in the Journal permit a continuing dialogue to occur on a global scale to a limited extent within the profession in international agricultural and Extension education, such efforts can be expanded successfully, as has been the case in other disciplines, e.g. the medical professions.

*Postulate 5.* Information and perceptions that people receive about the Association will be much more focused, specific, and less ambiguous if information concerning the areas of expertise that members can bring to the process of agricultural development were divided into knowledge bases and contextual applications when presented in AIAEE publications, Web sites, brochures, and other materials.
Postulate 6. It can be theorized that outsiders and prospective members may have the impression, especially after perusing several issues of the Journal and The Informer, that there is not a coherent, consistent, continuing focus in the activities of the Association.

Postulate 7. Because differences exist in perceptions and values concerning scholarship, it can be theorized that serious dialogue through live discussions, Journal articles, and conference presentations would bring clarification and better understanding about what the scholarship should be for which the Association strives as it works to assist its members and to increase its influence and effectiveness.

Postulate 8. While related to Postulate 7, it can be theorized that AIAEE Objective 6 can be broadened to encompass multi-dimensional scholarship and not imply a focus based solely on research.

Postulate 9. Because of the lessons learned in the successful collaborative Texas-Mexico agricultural development initiative, and because of lessons learned or not learned in other settings, it may be theorized that such lessons learned may be applied by AIAEE members in other development settings.

Postulate 10. Because many members of AIAEE have not had experience with problems and procedures faced in managing programs or projects and the underlying principles of management and development, but are likely to engage in such efforts in the future, it may be theorized that such topics could be featured in AIAEE conferences, publications, research, and in collaborative efforts with other organizations and associations, as has been demonstrated in other disciplines, e.g., the management field, and thus help to achieve Objective 7.

Postulate 11. Because limited alignment exists between published topics in journals relating to international agricultural and extension education and international agricultural development sponsored by professional associations and the course content at universities that have been examined, at least in the United States (Acker & Grieshop, 2004), it can be theorized that a serious “disconnect” exists that could dilute the effectiveness of graduates of programs in higher education or the membership of professional associations interested in working in international agricultural and extension development education.

Be forewarned. The author of this paper is not reporting specific research. Instead, questions are raised and food for thought is presented relative to the stated objectives of the Association. The theoretical base presented and the comments related to the objectives are the heart of this paper.

First, it is recommended very strongly that the reader, besides reading this paper, read the excellent, appropriate, and timely keynote address, “Leadership through Service: All the Easy Jobs Have Been Taken,” presented by David G. Acker (2005) at the 21st annual meeting of AIAEE on May 25, 2005 and reprinted in the Spring 2005 issue of the Journal of International Agricultural and Extension Education.

Why? Dr. Acker outlined four things very well: 1) the kind of world in which we currently live and work, 2) our grand challenge as an Association, especially as it relates to the eight goals of the 2000 Millennium Summit, 3) the kinds of leaders needed to meet this grand challenge, and 4) ten especially important things that agricultural and extension educators can do right now. As there was no need to reiterate the excellent points made by Dr. Acker, this writer could address points arising from the mission and previously stated specific objectives of AIAEE.

Several international organizations and/or publications exist with similar or related missions pertaining to international agricultural education and development, e.g., Association for International Agricultural and Extension Education,
European Seminar on Extension Education,
The [formerly European] Journal of Agricultural Education and Extension,
Southern and Eastern African Association of Farming Systems Research-Extension
(SEAAFSRE), Journal of Extension Systems, and Association for International
Agricultural and Rural Development. These and other resources with compatible goals
and activities exist. In other settings, it has been shown that a multiplier, compounding
effect results when individuals or organizations collaborate with other individuals or organizations to pursue a common goal. Therefore, a rationale for Postulate 1 can be developed and supported.

AIAEE Objective 1. Articulate the role of agricultural and Extension education in international agricultural development [and] review a vision for the future, 11 years old.

AIAEE has progressed and matured over the years. But has it achieved its potential? Consider the following: Roger Steele, president-elect of AIAEE in 1994, stated that “The wave of the future is participatory development whereby aid-givers and –receivers work together as partners” (Steele, Summer 1994, p. 1) when he announced the theme for the 1995 AIAEE conference in The Informer. He stated further that as professionals involved in social change that there were “many ways [in which] we can form partnerships with others engaged in the same endeavor” (p. 1). He listed four actions:

Increased collaboration between non governmental, governmental, universities, research centers, and private organizations, forming coalitions with professionals from various agricultural and social science disciplines, ensuring greater diversity in the profession, that is, providing opportunities for women, and people from diverse ethnic and geographic areas to become involved in AIAEE, and a better linkage between various components of the international, national, and local agricultural systems.”

About the same time, S. Michael Campbell (1994) completed an analysis of the philosophy of international agricultural and extension education and then compared this philosophy in a qualitative study of the opinions of 17 experienced members of AIAEE. Among his conclusions about the four problems faced by the Association at that time were the following: The problems 1) “...mirror the problems in our society at large, particularly as they relate to the idea of diversity. The diversity of the AIAEE was seen as both its strength and its weakness....This problem appeared most often in terms of members feeling a sense of separateness or otherness. This otherness was often sensed as a kind of discrimination” (p. 2). 2) A general problem in communication was perceived to exist and “developing inclusive methods of communication appears to be a task that AIAEE should take on....Developing non-hierarchical communications was the other important issue for the group” (pp. 2-3). 3) A duality of focus existed. “AIAEE appears to focus on the improvement of the lives of its clientele. There is confusion, however, as to who that clientele is ...[with] confusion over whether the organization should work exclusively with its members and other organizations, as pointed to in the by-laws, or work directly to improve the lives of people” (p. 3). 4) Related to the question of duality of focus was a conclusion about the role of AIAEE “...in developing an international agricultural and extension education curriculum. While it seems that most members felt it important to ground such a curriculum in the traditional AgEd areas of experiential and relevant educations, many also expressed the need for such an education to be much more broadly based. Such an education should include such humanistic subjects as philosophy, psychology, anthropology, mythology, and spirituality, in addition to the traditional areas in AgEd, e.g., program
development, evaluation, etc....It was suggested that we might even need to develop a new discipline, which would be called something like international agricultural development education” (p. 3).

Over 100 members worked in small groups during the 12th annual conference of AIAEE in Arlington, Virginia, USA in March 1996, using the concerns and conclusions identified by Campbell as described above as their point of departure, to project to 2005 a vision of what AIAEE would be or should be in order to provide guidance to the newly elected AIAEE leadership team for 1996-1997. Steele (1996) summarized the 26 key points of the members’ preferred future for AIAEE. While paraphrased and not listed here in their entirety because of space limitations, they related to AIAEE being highly participatory with 50-100 affiliates, being composed of professionals engaged in reflective analysis of critical agricultural issues, being characterized by greater participation of AIAEE members, decentralization and growth of communication between members, having established linkages with other organizations, having a diversity of people and ideas, having members enhancing their role as change agents, having linkages with other organizations, and establishing partnerships to build bridges “...between research and practice in social, biological, and physical sciences” (p. 1). Also, “...At the end of the next decade, members will have felt that AIAEE is inclusive, rather than hierarchical. Information will have been readily exchanged among members because of positive, supportive environment within the AIAEE” (p. 1). Graduate students will have scholarships and mentorship arrangements available. “In 2005, women will be even more visible in leadership roles in AIAEE....Even though AIAEE will have proactively addressed current issues, the focus on agricultural and extension education will have been maintained” (p. 1). A matured Journal meeting the needs of a broader audience with a diversity of content will exist. “The name will have changed from JIAEE to IJAEE to represent an enlarged world view, transitioning from a predominant U.S./Western focus to looking at the world to a more global perspective” (p. 2). AIAEE will be facilitating global linkages and “national associations/societies of agricultural and extension education professionals will have emerged. By 2005, AIAEE will have promoted and enhanced the benefits to be derived from linkages between similar organizations in various countries” (p. 2).

As a person in 2005 reading this vision for 2005, and seeing where we are today, which parts of this vision do you believe have been achieved? Which parts have fallen completely through the cracks? Which parts that have not been achieved are as critical to our responsibilities as social scientists working with different clienteles in varied national and international settings that they should become immediate items for action? Is it time to revisit our vision for AIAEE and prepare a realistic revised vision?

The members of an effective international association focus on actions that reflect emerging trends and issues relevant to that association’s mission and thus need to articulate their roles in doing so. In the case of AIAEE, a “people” organization, it is apparent that AIAEE can undertake, promote, support, or otherwise engage in activities that relate to at least 12 of the 40 sections of Agenda 21, the “comprehensive plan of action to be taken globally, nationally, and locally by organizations of the United Nations System, Governments, and Major Groups in every area in which [there are] human impacts on the environment....Commitments to Agenda 21 were strongly reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa from 26 August to 4 September 2002” (UN Department of Economic and Social Affairs, Division for Sustainable Development,
Those 12 sections of Agenda 21 are 1) international cooperation to accelerate sustainable development in developing countries and related domestic policies, 2) promoting sustainable agriculture and rural development, 3) global action for women towards sustainable and equitable development, 4) children and youth in sustainable development, 5) recognizing and strengthening the role of indigenous people and their communities, 6) strengthening the role of non-governmental organizations, partners for sustainable development, 7) strengthening the role of farmers, 8) transfer of environmentally sound technology, cooperation, and capacity-building, 9) promoting education, public awareness and training, 10) national mechanisms and international cooperation for capacity-building in developing countries, 11) international institutional arrangements, and 12) information for decision-making. These needs and opportunities for Association members to become involved underlie Postulate 2.

AIAEE Objective 2. Develop state-of-the-art papers on agricultural and Extension education worldwide.

Objective 2 and Objective 6 discussed below are related in terms of potential impact. Radhakrishna, Connors, Elliot, and Verma (2001) reported a survey of members of the Association undertaken by Eaton, Radhakrishna, and Diamond in 1994, 10 years after the organization of the Association. At that time, its members perceived that the two publications of AIAEE, The Informer and the Journal of International Agricultural and Extension Education, “...reflected relevant issues related to international agricultural development” (Radhakrishna, et al., 2001, p. 31).

The articles published in the Journal from 1994 through 2000 were also reviewed by Radhakrishna et al. (2001). Their review included subject matter topics, scope, focus, and program areas. They reported that “1) authors from a variety of public and private organizations representing all geographical regions of the world published articles in JIAEE, 2) articles published in JIAEE tend to be more research-oriented, and 3) subject matter topics such as extension education, agricultural education, sustainability, curriculum and global issues ...were the topics frequently published in JIAEE” (p. 31). A breakdown of their analysis of the subject matter of the 101 feature articles published from 1994-2000 is presented in column one in Table 1 below.

The subject matter categories of the 107 feature and 5 commentary articles that were published in the Journal from the spring issue of 2001 through the summer issue of 2005 were also examined by this writer. Shifts or changes in topics or types of articles appearing in the Journal since 2001 have occurred. Eleven more categories were added to the 19 categories reported earlier for the 1994 – 2000 period.

As can be seen in Table 1, while roughly the same numbers of articles were published in 11 of the 1994-2000 categories, 37 articles appeared in new categories from 2001 through 2005. As one examines the table, one should draw his/her own conclusions about the reasons behind the shifts that are displayed.
Table 1

<table>
<thead>
<tr>
<th>Subject Matter Categories</th>
<th>1994-2000(^1)</th>
<th>2001-2005(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural extension, both programs and personnel</td>
<td>26</td>
<td>28</td>
</tr>
<tr>
<td>Agricultural vocational-technical education, primarily secondary level</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Sustainability</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Curriculum development and content</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Global issues</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Women’s programs and issues</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>International agricultural development</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Evaluation, programs and techniques</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Technology transfer</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Indigenous knowledge</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Youth, including international knowledge</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Small farmers</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Collaboration</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Student performance</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Leadership</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Adult education</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Farming systems</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Other, dairy</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Internationalizing the curriculum</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Organizations, organizational support, university partnerships</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Participatory education, programs</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Applied research and techniques</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Technical subjects, e.g., dairy, AIDS</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Rural education, rural development</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Academic preparation of faculty</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Preparing to work in the international arena</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Using available resources, e.g., library</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Communication for development</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Adjustment of international students</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>101</strong></td>
<td><strong>112</strong></td>
</tr>
</tbody>
</table>


\(^1\) 18 issues of the *JIAEE*. Feature articles reported only.

\(^2\) 14 issues of the *JIAEE*. Includes both feature and five commentary articles.
Please note some of the changes that stick out. In the past five years, only one article was published that pertained to global issues. Eight articles, however, related to internationalizing the curriculum, five pertained to organizations or organizational support and institutional partnerships, and four pertained to participatory education and programs. While Radhakrishna et al. (2001) noted that articles in the Journal tended to be research-oriented, note that since then four articles also dealt with specific research techniques rather than with research projects per se, e.g., “Handling of Nonresponse Error in the Journal of International Agricultural and Extension Education” (Lindner, 2002). Also, note that 15 articles in the past five years (13.4% of the total) related in some way to people becoming knowledgeable about, being prepared to work in, communicating in, or adjusting to cross-cultural settings in the international arena. The record described above pertains to papers or articles that have appeared in the Journal of the Association. However, to this writer’s knowledge, the Association has not sponsored or sought the preparation of inclusive “state-of-the-art papers on topics of agricultural and Extension education worldwide” (Association for International Agricultural and Extension Education, n.d., ¶ 1). Professional associations in other disciplines do seek out and do sponsor benchmark papers, manuals, and books applicable to their field, e.g., the Handbook or Research on Teacher Education, which was a 1990 project of the Association of Teacher Educators. Social scientists have undertaken such activities in other fields and those activities have helped to advance those fields, thus basis for Postulate 3.

AIAEE Objective 3. Establish a continuing dialogue within the profession in international agricultural and Extension education on a global scale.

The nature and structure of the Association’s annual conference and articles in the Journal permit such a dialogue to occur to a limited extent. Such efforts can be expanded as has been demonstrated in other fields, e.g., the medical profession. Consequently, the rationale for Postulate 4 can be supported.

AIAEE Objective 4. Establish and maintain a continuing dialogue between AIAEE and donor agencies for international agricultural development.

Other than involving people from such agencies as Food and Agricultural Organization (FAO), United States Agency for International Development (USAID), and International Fund for Agricultural Development (IFAD), as speakers at annual conferences, such a dialogue has not occurred. To what extent have we collectively, rather than individually, provided input into proposals being prepared for development programs and projects? What is our documented “track record” in this area?

AIAEE Objective 5. Establish a roster of professionals in agricultural and Extension education who can provide the expertise needed to assist funding agencies in planning and implementing agricultural and Extension education programs and institutions in other nations (and focused activities of AIAEE).

This writer has heard potential members of AIAEE express the opinion on occasion that “your Association seems to try to be all things to all people in agricultural development. If that is the case, how does it make a difference?” Or, as one person put it, “It appears that AIAEE must be for generalists and generalists don’t accomplish much.” Or, in an e-mail received was this query: “I gather from your Web site that AIAEE members have experience in many different areas. I am working in Tanzania. How can I find out who can help me figure out a way to get some farmers here to adopt improved millet varieties? They [farmers] don’t like new things.” An informal survey among several long-time members of the
Association who live in different countries and who in turn have worked in other countries revealed that they have encountered similar comments or questions. Why is this occurring?

No distinction or differentiation is made between the bases of knowledge possessed by the members of the Association or the contextual applications of the setting, area, or program on which members focus their efforts while applying the knowledge base(s) in which they have expertise. Might this be one of three contaminating factors at work as the areas are diverse in which members have expertise as described on the Association’s Web site? It states that:

The AIAEE seeks to serve as a worldwide catalyst in bringing the collective expertise of agricultural and Extension educators to bear on the problems of human resource and agricultural development. Areas of expertise that agricultural and Extension educators can bring to the agricultural development process include agricultural education in public schools, rural youth programs, agricultural Extension, teacher education in agriculture, human resource and development programs, research and evaluation studies, institution building for agricultural development, programs for agricultural curriculum development and teaching methods, in-service education, human resource management programs, youth development, needs analysis and program development. (Association, n.d., ¶ 2)

A knowledge base is “...knowledge expressed in articulated understandings, skills, and judgments which are professional in character and which distinguish more productive [members] from less productive ones” (Reynolds, 1989, p. ix). “This body of knowledge is undergirded by theory, research, and a set of professional values and ethics” (Corrigan & Haberman, 1990, p. 195). A contextual application is the setting and related conditions, often thought of as a “field,” in which the educator, change agent, programmer, administrator, planner, student applies the knowledge bases with which he or she is engaged. For descriptions and examples of different knowledge bases and contextual applications, including those listed in Table 2, please view the Web site: http://www.aged.tamu.edu/workgroups/gc90.asp, which was developed by faculties in agricultural education at Texas A&M University and Texas Tech University, U.S.A.

Table 2

<table>
<thead>
<tr>
<th>Knowledge Bases</th>
<th>Contextual Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>Agricultural communications</td>
</tr>
<tr>
<td>Delivery strategies</td>
<td>Distance education and technology-enhanced instruction</td>
</tr>
<tr>
<td>Evaluation and accountability</td>
<td>Extension education</td>
</tr>
<tr>
<td>Leadership</td>
<td>International agricultural development education</td>
</tr>
<tr>
<td>Planned change</td>
<td>Leadership and community education</td>
</tr>
<tr>
<td>Planning and needs assessment</td>
<td>Teacher education</td>
</tr>
</tbody>
</table>
The advantages of providing specificity and focus by identifying the knowledge bases and contextual applications in the areas in which members have expertise and work so as to describe them and to interpret their work and capabilities more accurately underlies Postulate 5.

A second contaminating factor also may exist that causes people to perceive that a lack of focus exists within the Association based on the wide variety of topics of articles appearing in the Journal as described earlier. For example, outsiders and prospective members may have the impression, after perusing several issues of the Journal, that there is not a coherent, consistent focus in the Association. It must be recognized, however, that this writer has not undertaken a survey of perceptions of members and non members to determine if this truly is the case. As this factor is known to be at work in other fields, Postulate 6 was developed to address this issue.

A third contaminating factor may also cause people to perceive that there is a lack of focus within the Association. What is it? There has not been generally available to the membership since 2001 an updated, published, annual program of work or program of activities. Such a program provides insights as to activities and direction currently being undertaken.

What should be done to improve the perception that the Association has focus and direction? The writer offers five recommendations. First, develop a listing of knowledge bases held and contextual applications engaged in by members. Such a listing will help differentiate the areas in which expertise is held by members. Second, when developing a listing of Association membership, solicit from members their primary and secondary knowledge bases and their primary and secondary contextual applications to be listed along with other personal or professional information in the membership directory. Third, prepare a consolidated listing of members by primary and secondary areas of knowledge base and contextual area and make this information available as an Association information bulletin and/or post it on the Association’s Web site. Fourth, establish themes well in advance for each issue of the Journal such as is done now when establishing themes for each annual conference of the Association. Fifth, place the program of activities developed annually by the Leadership Team on the Association’s Web site, in the Association newsletter, The Informer, and possibly in the Journal.

AIAEE Objective 6. Encourage research within the profession that will favorably impact on agricultural and Extension programs in countries around the world.

Many members of the Association are engaged in research and other forms of scholarship because of their academic endeavors and positions in institutions of higher education. Many such efforts have been noteworthy. Have we, however, emphasized research per se and have not emphasized enough scholarship in all of its forms? Have we engaged in scholarly activities that truly have made a difference in our profession? Have members of our Association undertaken truly new scholarship or have we simply ridden on the coattails of what others have done in other fields? What new ideas in teaching and learning have we developed, tested, and applied? What new “learnings” have we accomplished? What have been our unique contributions to at least 12 common learning theories, to adult education, to planning models, to extension education, to applications of technology, to organizational change, to change theory, etc.?

Let us use change theory as an example. Many, many people in our profession work with change. We try to influence change, to get people to adopt changes, to keep them from going off the deep end by adopting inappropriate changes, to make organizational changes, to develop strategies of change that are appropriate within the culture with which we work, to
anticipate the consequences of change, etc. Many of us are familiar with and have used and applied different models, theories, and writings about change, e.g., Everett Rogers’ innovation-decision model, Kurt Lewin’s three-stage model, Lippit, Watson, and Westley’s seven-stage model, Jerry Porras’s stream analysis for organizational change, Brock and Salermo’s six-stage change model, Geoffrey Moore’s crossing-the-chasm technology-adoption model, and Bennis, Benne, and Chin’s writings on theory of change. However, what and how many unique contributions have we made in agricultural and extension education to advance change theory and its application? It may be that some of Düvel’s work in South Africa (Düvel & Abate, 2005), in which his findings illustrated the importance of intervening variables on influencing decision making and adoption behavior, are examples of a few exceptions to this condition.

Miller and Sandman (2000) in their excellent, thought-provoking article, “A Coming of Age: Revisiting AIAEE Scholarship,” presented and defined scholarship with its multidimensional facets and presented six categories of questions pertaining to scholarship for members of AIAEE to consider, whether they be academicians or practitioners. They pointed out that “Discovery, integration, application, and teaching of knowledge are central to the mission of higher education....A dialogue concerning the dimensions of scholarship and the implications for the profession is needed” (p. 39). They concluded that “the challenge to AIAEE is to further [sic] develop and support academicians and practitioners as reflective or scholarly practitioners....The current multidimensional definition of scholarship can energize and discipline AIAEE. Our scholarship has, too often, tended to be accounts, stories, if you will, of projects and activities. Account after account of study abroad programs and study tours, for example, do not advance the knowledge base of the discipline unless someone analyzes these experiences and makes meaning from them for the discipline” (p. 40). They further concluded that “if we are to become a ‘discipline,’ then we, as a profession, need more than common interests evolving from practice” (p. 37). Differences in perceptions and values exist with respect to scholarship, but scholarship is multi-dimensional. As differences can be resolved and consensus in understanding can be developed, it thus is possible to formulate Postulates 7 and 8.

AIAEE Objective 7. Improve the skills and knowledge of professionals who want to work in international agricultural and extension education.

AIAEE is a “people” organization. As such, many of its members have been, are currently, or will be involved in programmatic development efforts in different countries, many of them collaborative efforts. Because we are in the “people” business, are we truly cultivating the professional inspired and inspiring leader-managers that Bruce Lansdale (2000) described, leader-managers who are successful? It has been documented that “underlying all successful development programs is the thread of seeking out, paying attention to, involving, working with, collaborating with, and obtaining feedback from the intended beneficiaries of development programs, projects, and activities” (Christiansen, 2000, p. 227). But, before this “product” or “outcome” principle of development is applied, can be achieved, or can be evaluated (Stufflebeam, 1973), other “process” or “ways and means” principles that have emerged from lessons learned in development must be followed by people engaged in collaborative development efforts.

Piña (2001) stated six of those lessons well in reporting on 22 successful collaborative Texas-Mexico agricultural development projects that took place from 1993 through 2001. Those projects involved 63 faculty members from the College of
Agriculture and Life Sciences of Texas A&M University and 43 counterparts from the Technical Consortium from Northeast Mexico. The lessons were that (1) dialogue must take place between the personnel from each country in identifying the issues to be addressed; (2) representation is needed from all groups benefiting ultimately from joint efforts at all stages of the process; (3) cost sharing is essential for every activity undertaken, (4) all projects need a marketing component, whenever possible; (5) students must be involved at every opportunity; and (6) joint evaluation of outcomes to determine impact on policy is essential.

Although lessons for success were demonstrated in the successful collaborative Texas-Mexico agricultural development initiative, appropriate lessons have not been learned in other settings (e.g., Paddock & Paddock, 1973; Paul, 1982; Rondinelli, 1977). Many members of AIAEE have not been in a position to observe such lessons and the application of relevant underlying principles of development, but are likely to engage in such efforts in the future. Other disciplines, e.g., the management field, have demonstrated success in preparing people to manage programs and projects. By examining Postulates 9 and 10, one result would be to help achieve Objective 7.

A limited alignment exists between published topics in journals relating to international agricultural and extension education and international agricultural development sponsored by professional associations and the course content at universities, at least in the United States (Acker & Grieshop, 2004). Consequently, a serious “disconnect” could exist that dilutes the effectiveness of graduates of programs in higher education or members of professional associations wanting to work in international agriculture. Reducing this disconnection as addressed in Postulate 11 would also help to accomplish Objective 7.

Other Issues and Questions

Space limitations preclude discussion of other issues related to the specific objectives discussed above that need to be raised and considered by the profession and the Association. Each of them can fit into an expanded theoretical base. Among them are the following:

1. Are we developing effective international partnerships between and among universities engaged in development activities in agricultural education? (Etling, 2005)

2. Time and time again, we find people who advise in, prepare for, or manage agricultural development activities who do not handle well the 24 factors common in managing development programs (Christiansen, 2000). Could we highlight successful program and management practices as a theme in Journal articles and conference topics to help people prepare better to manage development efforts successfully? Doing so would assist in achieving Objectives 1, 2, 3, and 7.

3. Have we explored, selected, and used effective methods to encourage and then to prepare young professionals to work in the international arena in agricultural development knowing that people who entered the work force in the year 2000 can expect to work on two continents during their careers?

4. An integrated and holistic approach (Squire, 2003) to sustainable agricultural development is effective. However, this approach has not been used in many development efforts. Is this an example of an emphasis upon which the Association and its members could focus when working with development organizations, undertaking scholarship, establishing themes for conferences and the Journal, and when preparing people to work in the international arena?

5. Why are a considerable number of people who once were active in the Association not active currently, even...
though they still work in international agricultural development?

**Conclusion**

As the reader of this article, and as you mentally point your finger at the writer, can you answer the questions implied in the three fingers pointed back at yourself? First, what are you next going to do, in and for, this profession? Second, what will you emphasize in developing both a focus and a long-term commitment in your own professional career in international agricultural development? Third, knowing that there are many ways in which you can make a contribution, what is realistic for you to do for yourself, your colleagues, the clientele with whom you work, and the Association for International Agricultural and Extension Education, and will you let people know what you can and are willing to do?

**References**


Major Issues and Solutions to Applied Climate Education in Australia

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Abstract
In the past decade, Australian agriculture has evolved considerably. During this period, climate variability has been of considerable concern, compounded recently by the threat of climate change. Applied climate education has attempted to keep up-to-date with these developments. Understanding the issues and solutions to applied climate education is a challenge confronting agriculture in Australia. This paper reports on the major issues and solutions to applied climate education in Australia as identified in the literature.

Keywords: Applied Climate Education, Sustainability, Issues and Solutions

Acknowledgment: This research was developed from an applied climate education project (ClimEd), which was funded partly by FarmBis, a program of the Australian Government Department of Agriculture, Fisheries and Forestry.
Introduction

Agriculture in Australia has evolved considerably in recent decade (Douglas, 1997; Kilpatrick, 2000), and this needs to be reflected in applied climate education. Commodity prices and yields oscillate in response to world prices and local and regional climate fluctuations and consequent supply and demand scenarios (Hammer, Nicholls, & Mitchell, 2000; Munro & Lembit, 1997). Major issues affecting Australia have been the variability of climate, frequency and duration of drought, plus subsequent diminished water supplies, salinity, and de-regulation and instability in established industries such as dairying and sugar cane. Climate education although not specifically responding to all these issues has also evolved with emphasis moving from one day workshops (George, Buckley, & Carberry, 1998) to accredited training courses (George, 2004a, 2004b). More resources have developed in print form (Bayley & Brouwer, 2000; Brouwer & George, 1995; Partridge, 2001; Truscott & Egan, 2002), software (or discussion support software) and Web sites to suit the needs of a diverse client group (Sivakumar, Gommes, & Baier, 2000; Clewett, Cliffe, Drosdowsky, George, O’Sullivan, Paull, et al., 2000; Clewett, 2003; Nelson, Holzworth, Hammer, & Hayman, 2002). Adults have stated they want from any applied climate education 6 things to occur simultaneously to be of value to them (Clarkson, 2000). These include: awareness of climate variability; understanding climate and causes of variability; historical records for their location; analytical tools to describe the variability; forecasting tools to give advance warning of likely seasonal conditions; application of forecasts to key decisions. In designing applied climate education, it is no small task to bring together relevant resources and expertise for a range of enterprises relevant to a broad geographic area with relevant climatic data (Clewett, 2003).

Of perhaps more importance however is not just the resources available but how training is delivered. Adult learning principles (Kilpatrick, 1997) and experiential learning have recently been more emphasised (Carberry et al., 2002; McCown, 2002). Problem-solving scenario exercises have also been utilised to accommodate the predominant ‘pragmatic’ learning styles relevant to producers (Davey, 1987; Honey & Mumford, 1986). Further work is happening in utilising ‘World Wide Web’ resources for schools (George, 2001) and also for adults. This work is continuing to be developed in consultation with the major client group of producers, so applications may be maximised. Participatory action research has informed practice to develop the best resources and in delivering appropriate training (Langenbach & Aagaard, 1990; George et al., 2003; George, Keogh, Buckley, & Mavi, 2003). Applied climate education via an accredited Unit of Competency (George, 2004b; George, Clewett, Birch, Wright, & Allen, 2005b), is one more tool that may assist in improving knowledge and skills to better manage the variable climate. It has the capacity to appeal to a diverse range of industries because of its emphasis on ‘process’ (of survey, analyse and plan), balanced with ‘content’ derived from the industry it is intended.

Issues and Solutions for Stakeholders

Researchers, agriculturalists and educators have been involved in applied climate education programs of varying success (Seeley, 1994; Vanclay & Lawrence, 1994; Clewett, 2003). An overview of some of the issues and ways that have been suggested to overcome these concerns is described in this section, along with how this improved educational design may redress some of these issues. If applied climate education has a role to play in helping reduce the uncertainty of farming in a variable climate, it is important to consider the major issues and solutions other
researchers have already discovered in this arena. This will be discussed with respect to the major client groups of producers (farmers), trainers, extension staff and some issues common to all groups.

Producers

Producers are confronted by a multitude of obstacles in relation to applying climate information in their management. These have been broadly grouped into climate information reliability, and, training preference and motivation.

Climate information reliability. The major issues confronting producers when applying seasonal climate forecast information in their management according to Vanclay and Lawrence (1994), are the obstacles of the information not being reliable enough, too regional or broad, no assistance with interpretation, no scope for changing management practices, not seen as a useful risk management tool, not promoted in media, late availability of seasonal information, stakeholders had little idea of how to incorporate into management planning, poor understanding of link between seasonal forecasts and yield [and prices], lack of management options available regardless of season. Possible solutions include:

- Establish local champions
- Distribute seasonal climate forecasts for management rather than as a general seasonal climate forecast
- Use extension networks
- Run training for advisors, facilitators, producers
- Develop case studies
- Evaluate usefulness of seasonal climate forecasts
- Forecast with longer lead times
- Improve forecast accuracy
- Consider producers points of view
- Enhance opportunities to learning by use of narratives (Cathro, 1995; van der Does & Arce, 1998).

Applied climate education needs to include an examination of climate historical records along with examinations of forecast skill and timing issues (Clewett, 2003; George, Clewett, Birch, Wright & Allen, 2005b). Historical climate and yield relationships need to be scrutinised because it will be a pointer for sustainability and highlight the affect of improved management of climate on the soil - plant - animal - water systems being utilised in the future. Involvement of producers with experience in an industry although not directly documented in the design but in-building time for reflection and discussion of others experiences is essential. Balancing climate forecasts with better understanding of historical climate variability is also a useful tool (Sherrick, Sonka, Lamb, & Mazzocco, 2000; Clewett, 2003).

Training preference and motivation.

Many producers have constraints to adoption of technology because of a number of factors including: new technology is complex, unclear observable outcomes, financial cost, beliefs and opinions about technology, farmer motivation, relevance of new technology, attitude to risk and change (Guerin & Guerin, 1994; Visser, Cawley, & Röling, 1998; Jarvis, 1995). There may also be reluctance to participate in training/education, especially older producers with low levels of formal education (Murray-Prior, Hart, & Dymond, 2000; Austen, Sale, Clark, & Graetz, 2002). It is also possible there is a lack of suitable local training activities and lack of confidence in relevance of training and a preference of informal over formal learning (Murray-Prior et al., 2000).

Guerin and Guerin (1994) maintain extension and education has to play an increasingly important role. Education and training assists in altering values and attitudes to new practices (Kilpatrick, 2000). There is a possibility many of these obstacles may be overcome by using participatory approaches, soft systems methodology, incorporating ways to address
differently decision making styles and social context of potential users (Lynch, Gregor, & Midmore, 2000) or a range of techniques (Millar & Curtis, 1997; Black, 2000) and sound methodology (Carr, 1997). Producers prefer information from known sources over training (Kilpatrick & Rosenblatt, 1998) because of independence, need of familiarity with highly contextual learning mode, lack of confidence in training settings, and there may be a genuine fear of exposure to new knowledge and skills (Seeley, 1994).

Weather and climate information and forecasts need to be specific to agriculture (Seeley, 1994) and locations. It is useful to demonstrate the value and benefits of increased understanding of climate variability and seasonal climate forecasts (Cobon, Unganai, & Clewett, 2003a, 2003b). Visser et al. (1998) adheres to an avoidance of the ‘transfer of technology’ method, preferring an approach as co-learning and instead aim for empowering the community (Macadam, 2000).

The design aspect of applied climate education should not be a factor contributing to reluctance of participants to attend training activities. However if local champions are convinced of the merits of a course, then by word of mouth, others motivations may be increased (Kilpatrick, 1997). The emphasis must then be on training key people in a community to help endorse the merits of applied climate education and training. Design which assesses the current knowledge and skills levels of participants, and then builds on these concrete experiences, is desirable (Kolb & Fry, 1975).

**Trainer/Facilitators**

An obvious issue with trainers and facilitators is ineffective training (Kilpatrick, 1997). Suggested ways to overcome this problem include:

- Interactive training with opportunity for discussion and interaction with participants and experts (Nelson et al., 2002)
- Relevant topics applicable to target group situations
- Credible facilitators, instructors and materials
- Groups of people who regard each other as similar and are comfortable
- Reduction or removal of barriers such as child care and travel
- Session times and venues to suit target groups work and personal lives
- Short sessions
- Value for money
- Programs taken in manageable chunks, and,
- Marketing through associations and organisations (Kilpatrick, 1997).

Applied climate education design should enable easy use of resources by trainers and facilitators (Kilpatrick, 1997). Participants Manuals with complementary training manuals are essential (George 2004a, 2004b). Training of credible trainers skilled in climate and agriculture needs to be addressed so sound design can be delivered to participants, which in turn requires sound marketing of an applied climate education program.

**Extension Staff**

Cai and Smit (1994), allude to the capacity/ability/capability of extension staff enabling integrating climate and weather information into agricultural production and natural resource management. This could be addressed by:

- Identifying personality and group types to provide targeted education
and training (Roberts, 2000; Shrapnel & Davie, 2001),

- Agriculture extension officers need a change of role from ‘teachers’ to ‘facilitators’ and be effective with appropriate tools for this (Engel & van den Bor, 1995; Hagmann, Chuma, & Murwira, 1996)

- Increasing the number of diploma graduates (and consequent resources), to meet the expected increased demand of clients, would require agricultural education to be more broad-based to meet the occupational demand, and target increased participation from the private sector (Rama Rao, Muralidhar, & Kalla, 1997).

- Deliver training at farmer field schools (van de Fliert, Pontius, & Röling, 1995), and,

- Promote sustainable agricultural practices (including climate / weather) in extension strategies (Düvel & Botha, 1999).

The above points are acknowledged and are beyond the scope of this paper but are included for the sake of completeness of covering the topic adequately.

**Instructional Materials and Processes to Improve Knowledge and Skills**

In designing an applied climate educational Unit of Competency for Australian agriculture, there is a need to balance content and process so as to appeal to a diverse range of industries and climatic zones. Feedback should be continually requested and analyzed so that exercises can be developed and applied in the farming business. Explanation of forecasts and research being developed to increase accuracy of forecasts is discussed (George et al., 2005a, 2005b). Preparations to be better organized for the ‘next’ dry time is always of paramount importance (George et al., 2005a, 2005b). Training of trainers in other agricultural educational industries (such as explicit livestock or cropping ‘streams’) is a strategy to assist in raising the profile of climate applications.

Learning is promoted where there are links between the subject matter and the problem often confronted by the stakeholder group (Davey, 1987; Kilpatrick, 2000). For example, looking at historical climate variability for producers own locations help to provide reflection and construct learning from their own experiences.

A major issue relevant to ‘all groups’ was global climate change – where is it specifically getting wetter or drier and, changes to frequency and duration of extreme events (Rasool & Fellous, 1997), plus consequent carbon management (Uri & Bloodworth, 2000). A possible solution is the need to incorporate latest climate change research results and ways to apply this research into agriculture and resource management and incorporating food security. Education with demonstration about value of increased soil carbon levels would also be desirable. Any educational design should allow for discussion about latest results of climate change, and discussion of impacts and options to include into a strategic planning process in time-frames that participants establish.

In terms of policy, Warren (1998) discussed the point that rural extension is an ad hoc reaction to a succession of crises rather than as a planned strategy. This leads to ideas about complementary education (Koulaouzides, 1997) for secondary, post-secondary and adult education. A possible solution is for climate, weather and agriculture needs to be incorporated into a strategic plan for agricultural education (van den Bor, Bryden, & Fuller, 1995; Warren, 1998). The above point is also acknowledged but is also beyond the scope of this paper but is included for the sake of completeness of covering this topic adequately.

**All Groups**

A major issue relevant to ‘all groups’ was global climate change – where is it specifically getting wetter or drier and, changes to frequency and duration of extreme events (Rasool & Fellous, 1997), plus consequent carbon management (Uri & Bloodworth, 2000). A possible solution is the need to incorporate latest climate change research results and ways to apply this research into agriculture and resource management and incorporating food security. Education with demonstration about value of increased soil carbon levels would also be desirable. Any educational design should allow for discussion about latest results of climate change, and
Being given immediate opportunity to implement what has been learned was also seen as valuable. For example, with beef producers, exercises could be utilised which had the current climate scenario and an opportunity to examine impacts and options and decisions for that region were seen as helpful (George et al., 1998). Providing opportunities to present and discuss ideas as a group help to discuss successes and mistakes from all participants is helpful and empowering (Macadam, 2000).

Exercises, which simulated a ‘real’ problem, are also seen as beneficial. Avoidance of learning which focused on theoretical examples or where producers could not see the benefits of the learning activity is encouraged. Discussion of a probabilistic forecast and what it means to different individuals was seen as clarifying the ambiguity often surrounding such forecasts (George et al., 1998).

Formal accreditation enables the creation of a standard and lifelong-learning pathway to be established, and embraced if desired by participants.

Adult Education Theory for Applied Climate Education and Training

An important part of adult learning theory is experiential learning (Kolb & Fry, 1975; Jarvis, 1995), which includes learners in planning their training (Merriam & Caffarella, 1991; Kilpatrick, 1997). Experiential learning emphasises a process of exploring, analysing, deciding and acting, then repeating the process with new issues. Action research combines theory and research to establish and implement a change of behaviour. Researchers study the efforts applied in early changes, assess what is not working and then refine or change the initial strategies (Langenbach & Aagaard, 1990). These theoretical models have had some success with education and training in applying climate information (Carberry et al., 2002; Keogh, Bell, Park, & Cobon, 2004).

Recommendations for Extension

In the past, information, education and training about climatic risk has mainly occurred through several avenues such as the media, several short courses and one-day workshops, books, software, Web sites (Cobon & Clewett, 1999; Paull & Peacock, 1999; Partridge, 2001; Clewett et al., 2000). This work needs to be maintained and further developed, and to be more widely embraced by extension staff with a focus in developing climatic risk management strategies with their clients. Specific applied climate education training for extension staff to apply in their work would be valuable in applied climate units that are strategically focused, in-depth and directed at management (George et al., 2004a, 2004b, 2005b). Initiation of a formal in-depth climate risk management training course (e.g. 40 hours theory, 40 hours practical) for farm managers, resource managers and agribusiness would be desirable.
Conclusion

There is no easy solution to the problems of climate variability and agricultural sustainability. However, educators can provide a process of designing and incorporating climate information into on-farm strategic planning and this helps the farm manager to be better equipped to assess, plan, monitor and respond to the current and expected future of farming in a variable climate. Applied climate educational design which incorporates strategic planning, is a valuable skill that can be applied across cultures, and is highly beneficial because of immediate relevance and lifelong learning implications. Climate education and training have a role to play in delivering the message from climate historical records and from a climate forecast, and its applications enhanced in agriculture and resource management. In addition, a guiding principle is that better preparation for managing climate variability should at least also help to improve the management of climate change.

References


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Knowledge and Skills Needed by Teachers in Chinese Agricultural Schools Regarding Curriculum and Instruction Reforms

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Abstract
Agricultural schools in China have undergone numerous transitions as the system is shifting from non-effective academic institutions to vocational-oriented education brought by China’s economic reforms during the past two decades. Changes of traditional curricular and instructional methods have been recognized as an important strategy to strengthen vocational offerings of the existing agricultural educational system. The purpose of this study was to examine teachers’ current and desired knowledge and skills related to curriculum and instruction. The population for the study was teachers of 12 agricultural schools in China. A systematic randomization resulted in a sample of 398 participants from the population. A survey questionnaire was constructed and used to collect data from randomly selected teachers. The results showed that teachers indicated a significantly lower level of current knowledge and skill and they desired to have a higher level of knowledge and skills regarding curriculum and instruction. Teachers also indicated that they were particularly in lack of expertise in educational technology and curriculum and innovative teaching. Based on the results from this study, a need for teacher training and professional development is evident at these 12 schools. It is strongly recommended that teachers should be given opportunities and support to attend teacher training and professional development programs, which will increase their current knowledge base and enable them to successfully implement curriculum innovations.

Keywords: Chinese Agricultural Schools, Curriculum and Instruction Reforms, Knowledge and Skills of Teachers, Teachers Professional Development Programs
Introduction/Background

A major transition in agricultural schools in China is underway as the system is shifting from non-effective academic institutions to vocational-oriented education brought by China’s economic reforms. Changes in traditional curricular and instructional methods have been recognized as an important strategy to strengthen vocational offerings of the existing agricultural educational system (Ministry of Education, 1998).

In the past, agricultural schools were academic institutions classified as secondary specialized schools. These schools taught a curriculum that was general in nature and the theory taught was quasi vocational. As a result of China’s economic reform movement, a mismatch of teaching strategies and curricula to meet the needs of the new economic realities has become evident in Chinese agricultural education (Chen, 2000). In response, agricultural schools have been tried to focus on practical training and job-related skills for students in vocational agriculture since 1990s. In addition, the reform efforts have been strengthened by the information obtained from educational systems outside China. Modular teaching approach, competency-based education, and student-centered instruction have been tried in some schools with the support from the Ministry of Agriculture in China and the Food and Agriculture Organization of United Nations (Weng, 1998).

Teachers have been identified as key players in this educational transformation. Traditionally, agricultural teachers were not required to be certified in teaching, and therefore most of them lacked systematic education in pedagogical knowledge and instructional methodology. This problem has aggravated the changes agricultural schools would like to implement. If systematic professional development of teachers is not addressed it will be challenging to move the reform movement forward (Chen, 2000). To sustain the reform efforts, building the skills of teachers to implement the new curriculum is a high priority with educational leaders at local, provincial, and national levels. What kind of attitudes, knowledge, and skills do teachers need to deal with the changes within local schools? What areas need to be addressed for teacher training and professional development? These questions have become central to the debate among all individuals involved.

Theoretical Framework

Curriculum has been considered an essential element for all schooling. Thus, when attempts are made to initiate reforms of the educational system, changes in curriculum have to be a starting point. As Kelly (1982) indicated, changes in the structure of the school system should be followed by attempts to make corresponding modifications to the curriculum. Without curriculum change, modifications to the structure of the system make little sense. Therefore, the reform of curriculum is essential to the formation of a new vocational educational system, as the curriculum is viewed as a basic element for overall educational changes (Weng, 1998).

Among different models of curriculum development, the Objectives Model has been considered a common approach. Having been developed and reformed in one form or another over many years, the major steps involved in the Objectives Model approach, summarized by Taylor (2000), are as follows:

- Conduct a situation analysis, diagnosing educational and training needs,
- Formulate aims for each level required; and allocate time,
- Formulate objectives for each level required (subject, unit, lesson etc.),
- Select the content of the teaching/training (i.e. what is to be taught),
- Devise teaching/training methods and learning experiences,
• Organize learning experiences; and allocate time for these,
• Develop assessment instruments.
Taylor (2000) also indicated that we all live in a changing society, in which new knowledge is constantly being discovered and old knowledge proved wrong. Policies, educational purposes and structures are also constantly changed. Curriculum planning therefore needs to be a continuous, open, and participative process.

Erickson (2001, p.3) noted, “the rapid changes occurring in the workplace are affecting the curriculum of vocational school programs by emphasizing problem solving, teamwork, and the use of technology in conjunction with “real-world” simulations and experiences.” Thus, educators should be willing to explore the connections between school and workplace and make learning more practical and meaningful.

In an effort to justify areas for future research in vocational education, Copa and Bentley (1992) indicated that technological change, global interdependence, and changing economic and social conditions and values resulted in the need for the continuous changes in the content of vocational education. How can these changes best be monitored and translated into an effective curriculum for vocational education? Attention needs to be given to strategies for content identification as well as curriculum change.

In another paper, Copa (1992) indicated that the reforms of vocational education appeared to be connected with curriculum development, evaluation and assessment, teaching methods, and teacher training. He stressed that career and technical education (CTE) teachers should be able to utilize various learning situations and different teaching methods effectively to accommodate different learning styles. Teachers also need to employ the most effective approaches to incorporate academic subject into their CTE programs.

In addition, CTE teachers need to work with academic teachers to facilitate a better understanding of the bond between theoretical information and its application.

**Purpose and Objectives**

The purpose of this study was to examine teachers’ current and desired knowledge and skills related to curriculum development and instructional methods in Chinese agricultural schools. The objectives were to:

• Describe the demographics of teacher respondents;
• Describe teachers’ current and desired knowledge and skills regarding curriculum and instruction; and
• Identify major knowledge and skills gaps related to curriculum and instruction.

**Methods and Procedures**

**Population and Sample**

The population for this study was teachers from 12 agricultural schools in China. These schools were selected since they were part of the reform efforts supported by the Ministry of Agriculture and the Agriculture and Food Organization of United Nations during 1994 to 2000. The total number of teachers in 12 schools was 1,299. A systematic random sampling technique was used to select teachers from each school. Every third teacher from the official teaching roster was selected, which yielded a sample size of 398 participants (Cochran, 1977).

**Instrument Development and Testing**

A survey questionnaire was employed to collect data from the selected teachers. The questionnaire was constructed based on an extensive literature review as well as researchers’ experience with the system. Forty items were developed to document teachers’ current knowledge/skills and desired knowledge/skills related to curriculum and instruction. Teachers’ self-reported current and desired
knowledge/skills were rated using the scale: 0 = none, 1 = low, 2 = average, 3 = high.

The questionnaire was translated into Chinese and validated by the agricultural educators both in China and the United States. The reliability was established through a pilot study in China. Several minor revisions were made to the questionnaire immediately after the pilot test. The reliability of the Cronbach’s coefficient alpha for teachers’ current knowledge/skills and desired knowledge/skills related to curriculum and instruction were 0.92 and 0.81 respectively.

Survey Administration

Surveys were mailed to 12 participant schools through a contact person in each school. A follow-up phone call to each contact person was made a week after the survey was distributed. The call was completed to further direct the process of participant selection and to provide survey administration. There were 398 questionnaires sent with 350 returned. The response rate was 88%.

Data Analysis

Data were input and analyzed using the Statistical Package for Social Science (SPSS). Both descriptive and inferential statistics were used to summarize data.

Findings/Results

Demographic Information on Respondents

The total number of teacher respondents was 350. The average age of teachers was 38 years old, with 14 years of work experience and 13 years of teaching experience. The majority of the respondents (61%) were male. Eighty-three percent of teachers responding were bachelor degree holders and only 17% had other educational preparation backgrounds.

Forty-four percent of the teachers were lecturers, 33% were senior lecturers and 22% were assistant lecturers. A substantial proportion of the respondents (70%) taught agricultural subjects, 29% taught academic subjects, and 1% taught both vocational and academic subjects.

Current Knowledge/Skills and Desired Knowledge/Skills of Respondents

Forty items were included in the instrument to gather teachers’ current knowledge/skills and desired knowledge/skills related to curriculum and instruction reforms. To perform inferential statistics, these 40 items were grouped into six categories according to the nature of each subscale measured.

Current Knowledge/Skills of Respondents

Results in table 1 showed that mean values of teachers’ current knowledge/skills ranged from 1.30 to 2.41 (“low” to “average”). The respondents tended to perceive a “low” level of knowledge/skills in five items: field trip ($M = 1.48$), role play ($M = 1.49$), computer-assisted instruction ($M = 1.38$), using computers in teaching ($M = 1.30$), and using multimedia aids ($M = 1.30$). They reported an “average” level of knowledge/skills in organizing student projects ($M = 1.50$), group projects ($M = 1.59$), curriculum development models ($M = 1.60$), modular teaching approach ($M = 1.65$), cooperative learning ($M = 1.69$), debate ($M = 1.71$), oral presentations ($M = 1.75$), measurable objectives writing ($M = 1.71$), and individualizing teaching ($M = 1.73$).

The respondents tended to report better current knowledge/skills in developing written tests ($M = 2.36$), writing teaching plans ($M = 2.30$), managing a classroom ($M = 2.41$), lecture ($M = 2.46$), motivating students to learn ($M = 2.24$), demonstration ($M = 2.24$), and preparing teaching materials ($M = 2.23$), although these items still fell into the scale of “average” level.
### Table 1

*Means and Standard Deviations of Current and Desired Knowledge/Skills*

<table>
<thead>
<tr>
<th>Knowledge/Skills</th>
<th>Current</th>
<th>Desired</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M (SD)</td>
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<td><strong>Planning and Management</strong></td>
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<tr>
<td>Writing a syllabus</td>
<td>338</td>
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<tr>
<td>Writing teaching plans</td>
<td>337</td>
<td>2.30 (.51)</td>
</tr>
<tr>
<td>Preparing teaching materials</td>
<td>332</td>
<td>2.23 (.69)</td>
</tr>
<tr>
<td>Conducting student internship programs</td>
<td>296</td>
<td>2.12 (.78)</td>
</tr>
<tr>
<td>Managing a classroom</td>
<td>334</td>
<td>2.41 (.58)</td>
</tr>
<tr>
<td>Managing a laboratory</td>
<td>327</td>
<td>2.04 (.85)</td>
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<tr>
<td><strong>Curriculum and Innovative teaching</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motivating students to learn</td>
<td>335</td>
<td>2.24 (.60)</td>
</tr>
<tr>
<td>Adopting modular teaching approach</td>
<td>339</td>
<td>1.65 (.81)</td>
</tr>
<tr>
<td>Conducting experiential learning activities</td>
<td>339</td>
<td>1.86 (.78)</td>
</tr>
<tr>
<td>Organizing cooperative learning</td>
<td>335</td>
<td>1.69 (.78)</td>
</tr>
<tr>
<td>Knowledge of curriculum development</td>
<td>336</td>
<td>1.60 (.77)</td>
</tr>
<tr>
<td>Developing student leadership skills</td>
<td>339</td>
<td>1.89 (.70)</td>
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<td>Developing students’ problem-solving skills</td>
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<td>2.16 (.66)</td>
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<td><strong>Competency-Based Education</strong></td>
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<tr>
<td>Writing measurable objectives</td>
<td>336</td>
<td>1.71 (.86)</td>
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<tr>
<td>Basing teaching upon tasks analysis</td>
<td>335</td>
<td>1.84 (.78)</td>
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<td>Conducting performance-based activities</td>
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<td>1.93 (.72)</td>
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<td>Conducting work-based contextual learning</td>
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<td>1.80 (.80)</td>
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<tr>
<td>Individualizing teaching</td>
<td>335</td>
<td>1.73 (.88)</td>
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<td>Offering timely feedback</td>
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<td>2.16 (.72)</td>
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<td>Using criterion-reference assessment</td>
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<td>1.93 (.76)</td>
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<td><strong>Teaching Methods and Activities</strong></td>
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<td>Lecture</td>
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<td>Discussion</td>
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<td>Demonstration</td>
<td>331</td>
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<tr>
<td>Case study</td>
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<td>Group projects</td>
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<td>324</td>
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<tr>
<td>Role play</td>
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<tr>
<td>Problem-solving</td>
<td>330</td>
<td>2.08 (.71)</td>
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<tr>
<td>Debate</td>
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<td>1.71 (.81)</td>
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<tr>
<td>Oral presentations</td>
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<td>1.75 (.92)</td>
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Table 1 (continued)

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<tr>
<th>Item</th>
<th>Current</th>
<th>Desired</th>
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<tr>
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<td>$M$</td>
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<td>Evaluation and Assessment</td>
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<td>Practical test</td>
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<td>Oral test</td>
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<td>Student projects</td>
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<td>Skill test</td>
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<td>Attitude test</td>
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<td>Computer-assisted instruction</td>
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<tr>
<td>Using computers in teaching</td>
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<td>1.30</td>
</tr>
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<td>Using multimedia aids</td>
<td>335</td>
<td>1.30</td>
</tr>
</tbody>
</table>

Note. Scale: 0 = none, 1 = low, 2 = average, 3 = high; low ≤ 1.5; < 1.5 average < 2.5; high ≥ 2.5.

Desired Knowledge/Skills of Respondents

Overall, the respondents tended to report a “high” level of desired knowledge/skills related to curriculum and instruction reforms in all 40 items. The mean values were within the range of 2.52 to 2.85 and showed little fluctuation among 40 items.

Many of the respondents desired to have a higher level of knowledge/skills in common practices regarding teaching and learning. These items were: writing teaching plans ($M = 2.83$), preparing teaching materials ($M = 2.83$), lecture ($M = 2.82$), demonstration ($M = 2.81$), practical testing ($M = 2.82$), motivating students to learn ($M = 2.85$), managing a classroom ($M = 2.85$), offering timely feedback ($M = 2.81$), and developing students’ problem-solving skills ($M = 2.84$).

Differences in Current versus Desired Knowledge/Skills of Respondents

A paired t-test was performed to examine the differences between current knowledge/skills and desired knowledge/skills of respondents regarding curriculum and instruction in six categories.

Table 2 presents means, standard deviations, paired t-test results, and Cohen’s d effect size between teachers’ current and desired knowledge/skills regarding curriculum and instruction.

Paired t-test results revealed that current knowledge/skills of respondents were significantly different from desired knowledge/skills ($p<0.001$). The respondents rated their desired knowledge/skills were significantly higher than the current knowledge/skills in all six categories.

The general guidelines for analyzing effect size developed by Cohen (1988) were used to determine the practical significance between current and desired knowledge/skills for each category. The effect size (Cohen’s d) was determined according to the following Cohen’s guidelines:

- Less than .20: Very small or little effect
- .20-.49: Small effect size
- .50-.79: Medium or moderate effect size
- .80 or more: Large effect size
The results revealed that all six categories had “large” effect size between current knowledge/skills level and desired knowledge/skills level (see Table 2). The category of evaluation and assessment had the lowest effect size value \((C.d. = 1.41)\) while curriculum and innovative teaching was showed the highest effect size value \((C.d. = 2.00)\) among six categories.

Table 2  

Means, Standard Deviations, Paired t-Test Results and Cohen’s d Effect Size regarding Current and Desired Knowledge/Skills

<table>
<thead>
<tr>
<th>Category</th>
<th>Knowledge/Skills</th>
<th>Current</th>
<th>Desired</th>
<th>t</th>
<th>p</th>
<th>Cohen’s d Effect size</th>
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<td>n</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Planning and management</td>
<td></td>
<td>279</td>
<td>2.18</td>
<td>0.44</td>
<td>2.80</td>
<td>0.31</td>
</tr>
<tr>
<td>Curriculum and innovative teaching</td>
<td></td>
<td>312</td>
<td>1.91</td>
<td>0.49</td>
<td>2.74</td>
<td>0.34</td>
</tr>
<tr>
<td>Competency-based education</td>
<td></td>
<td>328</td>
<td>1.88</td>
<td>0.59</td>
<td>2.69</td>
<td>0.41</td>
</tr>
<tr>
<td>Teaching methods and activities</td>
<td></td>
<td>304</td>
<td>1.85</td>
<td>0.53</td>
<td>2.65</td>
<td>0.44</td>
</tr>
<tr>
<td>Evaluation and assessment</td>
<td></td>
<td>311</td>
<td>2.04</td>
<td>0.49</td>
<td>2.68</td>
<td>0.42</td>
</tr>
<tr>
<td>Educational technology</td>
<td></td>
<td>326</td>
<td>1.32</td>
<td>0.91</td>
<td>2.55</td>
<td>0.69</td>
</tr>
</tbody>
</table>

Note. Scale: 0 = none, 1 = low, 2 = average, 3 = high; low \(\leq 1.5\); < 1.5 average < 2.5; high \(\geq 2.5\). The significance level for mean difference is at 0.05.

Conclusions

Teachers tended to report a lower current knowledge/skills and a higher desired knowledge/skills in all 40 items related to curriculum and instruction. Educational technology was the lowest rated current skill area among six categories. Teachers seemed particularly interested in improving their knowledge and skills in the most common practices in teaching and learning. These areas were: lesson plan development, teaching material preparation, skills of lecturing and demonstrating, motivating student to learn, student assessment, and developing students’ problem-solving skills. As teachers have more autonomy, they may see the importance of these practices in improving students learning.

Overall, teachers were very interested in upgrading their knowledge and skills related to curriculum and instruction, as their self-reported scores showed a significant difference between their current knowledge/skills level and desired knowledge/skills level. The results also revealed that teachers felt particularly inadequate in areas of educational technology and curriculum and innovative teaching. However, most teachers desired more training in educational technology, as they perceived that they had very limited expertise and skills in this area. Teachers might also see a great potential of using technology to improve the quality of teaching. In the past, teachers had a very limited use of technology in classrooms. Few teachers used overhead projectors and very few teachers have tried computer-aided instruction.
Implications and Recommendations

Based on the results from this study, a need for teacher training and professional development is evident among the schools that were surveyed. Thus, policies and resources should be mobilized to tackle these issues.

It is strongly recommended that teachers be given the opportunities and support to attend training and professional development programs, which will likely increase their current knowledge base and enable them to successfully implement curriculum innovations.

Increasingly technology is used to overcome limitations and obstacles in teaching. With the rapid advancement and wide use of technology in education, it has the potential to help agricultural schools close the educational gap that exists between urban and rural schools. Therefore, educational technology should be put into teachers’ training agenda.

Coherent and systematic policies and guidance should be formulated in teacher education and professional development activities. Resources, administrative and technical supports need to be provided to assist teachers in implementing reform initiatives. Young and beginning teachers may need more support and training than their older colleagues, especially in areas of teaching methods and curriculum planning and management. In addition, both pre- and in-service training needs to focus on the areas that teachers feel inadequate or where they never received formal training such as pedagogy, curriculum development, instructional methods, educational technology, and competency-based education. What is more, teacher education should be incorporated into higher education in agriculture to promote a systematic formulation of policies and action plans in teacher pre- and in-service training.

Agricultural teachers need to have access to update their knowledge and skills annually through courses, seminars, and workshops that could provide pedagogical updates.

This study should send a strong signal to state and regional educational authorities in China regarding the need for professional development of teachers. The interest level of teachers wanting to improve their knowledge and skills is noteworthy. With all of the changes that are taking place in China, it is necessary for vocational agriculture to keep pace with changes in the industrial sector of society. China has one of the largest agricultural workforces in the world. With more than 60 percent of the people in China with direct agricultural production ties it is critical that the next generation of agriculturalist have improved education. Implementing the recommended changes noted in this study could be the first step toward fundamental and systematic changes in the system of vocational agricultural education in China.

References


Search for Better Institutional Arrangements for Agricultural Extension Services in a Decentralized Context: The Republic of Benin

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Abstract
The process of decentralisation and privatization of agricultural extension services in Benin must take into account important issues such as the news actors, including agricultural producer organisations, private sector and NGOs, the reduction in the power of high level extension administration, active participation or stakeholders in the financing of extension service, financial and technical assistance from the State, particularly for resource-limited communes, institutional changes that are adapted to both decentralisation context and local management capacity. In the new decentralised system, agricultural extension needs to be flexible and avoid hierarchical structures Most of the staff should be in the communes and should be oriented towards enhancing the capacity of farmers and the elected local governments to participate in the process of solving their problems and reach their development objectives, including financing of agricultural extension services. To achieve all this, adequate decision-making power and resources for extension activities should be transferred to commune level. The experience from Benin indicates the difficulties African countries in general, and Benin in particular, will face when trying to better tune extension activities to local needs.

Keywords: Agricultural Extension, Decentralization, Farmers’ Organizations, Financing, Participation, Privatization.


**Introduction**

Agriculture is the foundation of the economy in Benin. It provides about 70% of export incomes and 40% of the Gross Domestic Product. Agricultural development activities in the country, including extension and research activities are funded by public funds and donor agencies. For decades, all agricultural development activities in Benin, including extension services, were exclusively carried out by the government through its Ministry of Agriculture. However, since 1989 when Benin accepted the Structural Adjustment Programme (SAP) and engaged in a democratization process, extension institutions have been going through a restructuring process. This restructuring process has two main components: (1) the transfer of commercial activities to farmers through their organizations, and (2) the focussing of extension activities only on information provision and training of farmers. Due to the process of democracy and the liberalization of the economy, extension activities are no more the exclusivity of the government. NGOs, private and professional organizations are now all engaged in extension provision.

Recently, decentralization has become a reality in Benin since local governments have been democratically elected. Such a radical political change calls for a rethinking of extension organization in Benin. The necessity of transforming agricultural extension services to meet the requirements of the new political, economic and social contexts in Benin is the central argument of this paper. It explores the chance of survival of public extension services in the decentralized context.

**Evolution of Agricultural Extension Organizations in Benin**

A comparative analytical framework was used to outline the evolution of agricultural extension organizations in Benin. The framework, as depicted in Table 1, includes seven criteria: (1) the objectives of the extension services, (2) the functions carried out, (3) the extension approaches used, (4) the extension delivering methods, (5) the organizational structures of extension activities, (6) the origin of the extension demands, and (7) the quality of the Village Extension Workers. Finally, four different periods are taken into account in the analytical framework, including the post-colonial period (before 1972), the revolution period (1972 to 1989), the early structural adjustment period (1989 to 1996), and the liberalization period (1997 to date).

Although attempts have been made, as shown in Table 1, to make public extension services more professional, to liberalize extension provision, to give more responsibilities to farmers and to improve the methods of problems identification, the culture of the public extension services has not changed significantly since they still work with the same extension personnel without additional training (Tossou, 1995 & 1996; SPORE Magazine, 2005). Extension agents at lower levels do not have the necessary power to quickly respond to farmers’ needs. The lack of additional training does not enable them to use participatory approaches in problem identification, programme planning, implementation and evaluation.

However, the involvement of the farmers in extension planning has been improved since 1997 when participatory approach was introduced in the extension process to improve the problem identification process. This approach is called *Approche Participative Niveau Village* (*APNV*). It consists of proactively involving the beneficiaries at the local level from problem identification, planning, implementation and evaluation of impact. It enables communities to define their demand for local development support (Chabeuf, Toledano & Bouarfa, 2002).

NGOs and private cotton companies (e.g., inputs suppliers and cotton ginning companies) are now also engaged in funding extension services. They finance the
recruitment of extension agents who are managed by the public extension services. However, in reality it is a public-private partnership in the delivery of extension services.

Table 1

*Main Characteristics of Various Forms of Agricultural Extension Organization from the Post-Colonial Period to Date*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Objectives</td>
<td>Feed the needs of French industries</td>
<td>Ensure export incomes and food sufficiency</td>
<td>Transfer of commercial activities to farmer’s organizations</td>
<td>Improve extension impacts and effectiveness</td>
</tr>
<tr>
<td>Functions of (public) extension services</td>
<td>Research, inputs supply, Extension, marketing of cotton</td>
<td>Supply of inputs &amp; credit, Extension, marketing of cotton, regulation of agricultural production</td>
<td>Extension, regulation, training</td>
<td>Extension and regulation</td>
</tr>
<tr>
<td>Approaches</td>
<td>Commodity approach</td>
<td>Integrated Rural Development Approach</td>
<td>Training and Visits (T&amp;V) System</td>
<td>Village-level participatory extension approach</td>
</tr>
<tr>
<td>Methods</td>
<td>Groups through demonstration plots</td>
<td>Individuals and groups methods</td>
<td>Contact groups approach on a fixed calendar</td>
<td>Demonstration units, contact groups</td>
</tr>
<tr>
<td>Organizational structures</td>
<td>Hierarchical</td>
<td>Hierarchical</td>
<td>Hierarchical with norms to meet</td>
<td>Hierarchical with norms to meet privatization and professionalization</td>
</tr>
<tr>
<td>Origins of the demand</td>
<td>Market-oriented</td>
<td>National goals-oriented</td>
<td>Technology-oriented</td>
<td>Problem-oriented</td>
</tr>
<tr>
<td>Quality of VEWs</td>
<td>Level 1</td>
<td>Level 1</td>
<td>Level 1 mainly &amp; Level 2</td>
<td>Levels 1 &amp; 2</td>
</tr>
</tbody>
</table>

*Note.* Four levels can be distinguished among extension workers as follows: Level 1: Primary school + nine months of professional training in agriculture related fields; Level 2: Primary school + four years of professional training in agriculture related fields; Level 3: Level 2 (or four years of general education in secondary school) + four years of professional training in agricultural related fields; and Level 4: five years of university training (agronomists).
The extension delivery system seems to be moving from one extreme to another. It is moving from a monopoly by public sector to the domination by NGOs, professional and private institutions. This changing context calls for a new partnership between the key actors in the extension delivery systems, including farmers’ organizations, public agencies, private institutions and NGOs. The question is: are these various actors prepared for a sustainable intervention in the field of agricultural extension? This question is based on the fact that the quantity of extension personnel has decreased since the introduction of the SAP. Table 2 shows the agricultural extension staff situation in Benin between 1999 and 2005 based on projected total staff need of 903, 231 and 77 for Village Extension Workers, Subject Matter Specialists, and Farmers Organization Specialists, respectively during this period. Besides, agricultural extension services are handicapped financially, and do not have adequate human resource capacities.

Table 2

<table>
<thead>
<tr>
<th>Category of Extension Staff</th>
<th>1999</th>
<th>2001</th>
<th>2003</th>
<th>2005</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Village Extension Workers</td>
<td>488</td>
<td>241</td>
<td>146</td>
<td>164</td>
<td>903</td>
</tr>
<tr>
<td>Subject Matter Specialists</td>
<td>165</td>
<td>158</td>
<td>184</td>
<td>166</td>
<td>231</td>
</tr>
<tr>
<td>Farmers’ Organization Specialists</td>
<td>96</td>
<td>68</td>
<td>70</td>
<td>81</td>
<td>77</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>749</td>
<td>467</td>
<td>400</td>
<td>411</td>
<td>1,211</td>
</tr>
</tbody>
</table>

*Note.* The figures were calculated based on various reports by the Ministry of Rural Development, Republic of Benin.

Decentralization: Implications for Organization of Agricultural Development in Benin

Decentralization is the process through which, the State delegates part of its administrative activities to elected local government (World Bank, 1997). Decentralization aims at a better tuning of public services to the preferences and demands of local people. In Benin, according to Tossou (1997), three outcomes are expected from the decentralization process: (1) a large citizens participation in public affairs; (2) a behavioural change from the side of the population which must learn to mobilize their own resources instead of counting solely on the state; and (3) the mobilization of the grassroots around appropriate development objectives which guarantees local participation (i.e., the organisation of local development). To facilitate behavioural changes in the new context, motivation, competence and room to manoeuvre are critical factors that should be taken into consideration (Tossou, 1995).

In such a context of decentralization, characterized by an increase in the decision-making power and capacity at grassroots level, a strongly hierarchical extension services geared towards export crops is no longer relevant. It requires (1) devolution of power from the side of the upper bureaucracy—officials working at the national and regional administrative structures—to the level of the communes (the equivalent of districts) where the administration is no more ruled by officials appointed by the national government but by local elected officials, (2) relevant participation mechanisms to ensure better response to grassroots needs, (3) increased capacities to mobilize public and donor funds to finance local development, and (4) a flexible and progressive transfer of technical and financial responsibilities to decentralized entities. In fact,
decentralisation needs a change in behaviour and attitude.

Devolution of Power from the Upper Bureaucracy to the Local Level

Decentralisation calls for democratisation and promotion of development at local levels by elected persons. However, most of the specialised administrations in Benin have not yet reviewed their intervention strategies in line with the requirements of the decentralisation process. Decision-making processes are still highly influenced by public administrator and politicians at national or regional levels. This is consistent with experiences in other developing countries. For example, Van Dusseldorp (1995) has noted that in Sri Lanka and Nepal, decentralisation did not lead to such power transfer. Influence of technicians and politicians at the national level had remained strong in the decision-making processes. Upper administration was not motivated at all to transfer the relevant power and resources to local administrations.

Participation Mechanisms to Ensure Better Response to Grassroots Needs

Participation is a concept with different meanings for different people depending on the development approaches, perspectives and ideologies which support the participation process. However, according to Pretty and Vodouhe (1997), two kinds of participation can be broadly distinguished: (1) interactive participation and (2) partial participation. Interactive participation is a process through which individual actors or groups are directly or indirectly involved in all the steps/phases of interventions that affect their lives, from projects identification to actions evaluation. Participation is called partial when the concerned actors are not really involved in one or more steps of the intervention or extension process. Whatever its nature, participation may be spontaneous or induced, that is, the participative initiative may be internal or external to the concerned groups.

For an effective decentralisation process to occur, participation should be the nerve centre. Participation is crucial to the achievement of the development objectives of local entities with the limited available financial and human resources. This requires an effective participation of the local entities in the formulation of extension’s objectives and plans. The APNV Extension approach in Benin is a valuable tool. But, an evaluation of its implementation indicates the necessity to improve the technical, organisational and communication capacities of the personnel in charge of its application. Relevant platforms are needed to guarantee active participation of the local people and an identification of actions that go beyond the construction of infrastructures.

Capacity of Local People to Mobilize Internal and External Resources to Finance Local Development

The promotion of local development in the decentralised entities needs the mobilisation of local resources and state subsidies to compensate for the transfer of some of the domains of interventions (such as social and economic infrastructures, education and primary health care) formerly carried out by the national government to the local elected officials at the level of the communes. Currently, the capacity of mobilising local resources by decentralised entities is low. Administrators in the various government ministries at the national level are not willing to transfer resources related to the transferred competences to local level. Therefore, elected officials at the local level should find ways and means of accessing additional resources from donors. However, they lack the expertise in dealing with donor agencies.

Improving the capacity of local governments to mobilize the necessary resources on one hand, and the competence of local people in controlling the action of
the local governments on the other, will be a critical factor in ensuring the effectiveness of the decentralisation process. But, how can African countries in general and Benin in particular make such a jump? This calls for the necessity to introduce change, not only in the public administration, but also in the attitude and behaviour of local people. Attitudinal and behavioural changes need time and energy, but past experiences have shown that changes are taking place so rapidly in developing countries in such a way that they are leading to failures (Van Dusseldorp, 1995).

**Transforming Agricultural Extension Relevancy to Benin**

On the basis of the requirements for an effective assistance to the decentralisation process and the various experiences in extension organisation in Benin, some characteristics of the required extension services are proposed and argued. The key concepts arising from the discussions above are the need for (1) relevant assistance to local governments, (2) training to increase assistance capacity, (3) increasing participation, and (4) raising required resources to finance extension activities in a situation in which that state’s contribution is decreasing.

*Relevant Assistance to Local Governments*

Extension activities must be tuned to the concrete needs of the decentralized entities for reaching their development goals. This assistance to local community has to go beyond simple technical assistance. Social and economic aspects have to be taken into account by extension services to meet the current needs of local people and government.

Coping with the new context of decentralisation requires a rethinking of extension approach. Technical, social and economic information are crucial to enhance the capacity of local governments to assume their new roles. It is necessary to shift from a more centralized and directive, top-down extension organisation to a more decentralized and interactive one. The level of such decentralization should coincide with the level of decentralization at the level of the communes. The communes have legal political autonomy. Public extension institutions at commune level are the secteurs agricoles. As such, actions and strategies must be designed in each of the secteurs agricoles in accordance with the needs of the local population. The secteurs agricoles should be responsible for the rural development in their areas.

Two-fold contractual extension should be developed by local extension institutions: contract with the communes on given objectives and assistance on the one hand and contract with the extension headquarters at regional level on the other. With the communes, activities have to be negotiated and, in the long-term, additional resources provided by them through their development plans. Extension headquarters should, in the medium-term, provide the secteurs agricoles with the required running costs, and extension agents would be judged largely on the basis of their results. But, in the long-term, the secteurs agricoles must generate additional resources to improve the working conditions of extension workers. These resources may be derived from refunds that farmers associations and agricultural products exporting companies or bodies would pay to these secteurs agricoles as subsidies for their contribution to agricultural development. Such subsidies are actually being paid in Benin, but they are used mainly to recruit extension agents.

The importance of these subsidies depends on the efforts of public extension bodies to raise agricultural production level. These additional resources of the secteurs agricoles could also be derived from the ones that the communes have mobilized in the frame of the implementation of the planned activities related to agricultural production. To make such resources sustainable, extension agents should not only contribute to increased agricultural
production, but also raise the living conditions of farmers - that is, to help the communes achieve their development objectives in the rural sector.

To achieve the relevance of the assistance to local governments, it is important to provide more power and resources to the secteurs agricoles (i.e. autonomy in making their own decisions and allocating resources). Such power provision may enable extension personnel at local levels to take relevant decisions and actions. It may also make them more responsible and increase their concern and commitments for agricultural development. The feasibility and sustainability of such decentralization of power and resources call for a political will on the side of the authorities of the Ministries of Agriculture and Finance since the actual resources which have to be transferred to local governments following the competences’ transfer have not yet occurred.

Training to Increase Assistance and Technology Generation Capacity at Local Levels

Decentralization of extension activities as a way of tuning extension offers to the needs of farmers at local level through the APNV approach needs new skills, including technical, human relations, critical thinking and problem-solving skills necessary to work effectively with farmers as individual and groups in the rapidly changing and complex agricultural environment (Knipscheer, Zinnah & Mutimba, 2002; Zinnah, Steele & Mattocks, 1998). These skills, which are necessary for better generation and dissemination of technologies at local levels, are related to aspects such as diagnosis and prioritization of problems, planning, implementation, monitoring and evaluation of the relevant actions.

The required competences must be at the level of the secteurs agricoles instead of the regional level. In fact, in the prevailing situation, an average of more than 50% of the extension personnel in a given region is working at the headquarters either as extension officials, technical support staff, or as administrative staff. Such human resource allocation patterns have led to complex administrative and bureaucratic structure to the detriment of efficiency. Therefore, there is a need for reversal. Most of the extension personnel have to be present at local level. But, as has been demonstrated earlier in this article, the present situation in the field of extension is characterized by inadequate number of qualified extension workers. Thus, there is a need for competent extension workers since technical competence is necessary for credibility and consideration from the side of the local people in a truly decentralized extension context.

Increasing Participation to Extension Planning at Local Levels

Participation is critical in tuning extension activities to local needs. According to Schmidt (1998), the following factors are important for enhancing genuine participation: (1) climate of trust, (2) codetermination concerning financial resources, (3) sufficient technical competence, (4) accountability of extension agents to their clients, and (5) application of the subsidiary principle through which people give mandate to their own elected colleagues to take care of certain aspects of their common benefits and interests. However, trust cannot be built if the extension agents are unable to respond in due time to farmers’ needs. Extension agents should have the necessary power, autonomy and flexibility in planning their work. Trust can be increased and reinforced only if the extension agents are accountable to farmers or at least to the local elected governments. This means that, in the long term, extension services have to be transferred to the local government level. Thus, the extension personnel should be paid by the budget of the communes. Resources needed by the communes to meet such obligations should
be provided by the state and local revenues. Such transfer of power and competence should be done progressively. In the short-term, local governments can plan such extension activities in their development plans and look for the financial resources needed for their implementation.

There are still strong farmers’ associations in Benin, although their importance and power have decreased with the decline in the price of cotton—the country’s major commercial crop—on the international market in the last five years. However, there is a lack of transparency and renewal of committee members in most of the farmers’ associations. There is a kind of monopoly of the associations by their group leaders. Therefore, building a countervailing power structure within farmers’ associations is very vital today for transparent and efficient management of these associations. Such an objective may only be achieved if the training goes beyond the leaders and also addresses the building of the capacity of the members of the farmers’ associations.

**Raising Required Resources to Finance Extension Activities**

Resources needed to finance extension activities in the decentralized context may come from many sources, including farmers’ organisations, the private marketing companies and ginning industries, the communes and the state. Experiences with cotton production in Benin, has shown that farmers’ organisations and the private marketing and ginning industries are able to finance agricultural extension services. This needs political will, a better management of the resources of these farmers’ organisations, and the development of the so-called *filières* (the organization of the chain of activities from production, processing and marketing including the various necessary support systems) in order to diversify the financial assistance of the private institutions to extension services. Promising marketing chains do exist. Cashew, soybeans and cassava, for example, are gaining new interests in Benin and can be valued along with the well-known maize production which has not been well-organised till now.

The communes legally have the competence to mobilize internal and external resources. Internal resources may come from local taxes. Elected local government officials should find ways to increase the level of mobilisation of such resources. Certainly, the communes may not count solely on this internal resource in the short-run. They have the possibility to negotiate additional resources from various partners to finance local development programmes. For that, they need to elaborate their development plans in order to convince donors on the fact that the extension activities, like the other, have been designed by the beneficiaries themselves, both directly or indirectly through a subsidiary process.

**Conclusion and Implications**

The creation of new patterns of government by transferring various administrative functions to the communes through the decentralisation process calls for a new step in the decentralisation of agricultural development. Extension services should be part of the decentralization and devolution agenda, engaging the full involvement of local government units and grassroots organizations (Rivera & Alex, 2004). Decision-making power and financial resources should move from the national and regional levels to the local levels. Also, technical competences and qualified extension workers are more needed at the level of communes than the national and regional levels.

The communes as well as the farmers’ associations have to learn to mobilize internal and external resources to finance agricultural extension services (i.e., to take over the salary and running costs of extension institutions and make their personnel accountable to them). All of these require a political will, particularly at the
national level, to really support the process. The experiences in Benin suggest that the decentralisation process has created the conditions to better tune extension services to the local needs. However, there is still the need for more flexible institutional arrangements and the political will to take advantage of the opportunities created by this new context.

The reluctance of national officials to fully devolve political and financial powers to the local level is a strong sign of the difficulties African countries in general, and Benin in particular, will face in the process of tuning the extension activities to the decentralized context. The goal of organizing an effective decentralized agricultural extension system in Benin is yet to be achieved. This dream requires clear vision, dedication and skillful management (Rivera, 2003). This goal also requires committed and approachable leadership capable of transforming vision into action, of devolving power and authority over financial and human resources from the central government to local levels, and enabling the beneficiaries to access the right kinds of information at the right time in a user-friendly manner for proper decision making (Zinnah, 2003). The authors share the view of Annor-Frempong (2003) that the greatest challenges to extension service delivery in Africa are unlikely to be addressed fully by decentralization unless there is greater participation of users in the financing and control of the extension service providers.

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Lessons Learned and Present Prospects: A Critical Review of Agricultural Education in Thailand

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Abstract

Thailand is a leading food exporter in Southeast Asia. Over a century of development, agricultural education has been instrumental to agricultural development of the country. With the on-going movements in educational reform and renewed direction of agricultural development, there is a need to holistically examine the system of agricultural education in Thailand.

This nationwide study reviewed the past and examined the present prospects of agricultural education at three levels: basic education, vocational education, and higher education. The research methods include an extensive documentary analysis, an empirical analysis with surveys and case studies, and reflections from opinion leaders.

Inspired by the US land-grant model, the contemporary era of agricultural education in Thailand began in 1943 with an establishment of the first university specialized in agriculture. Stimulated by the green revolution of the 1960s and 1970s, agricultural education during that period expanded rapidly to meet the nation’s demand for manpower and technology. Aside from the success on this primary role, critics have pinpointed the side effects of agricultural education on small-scale farmers.

Strength of the Thai system of agricultural education lies in its comprehensive and diversified structure, a result of resource accumulation over the booming period. At present, the existing system is being questioned on its relevance. Higher education in agriculture, being the spearhead of the system, has been a subject of criticism on “functional imbalance.”

To be relevant, agricultural education must be more responsive to the changing contexts of national development, keeping equilibrium of competitiveness and sustainability of Thai agriculture. It is imperative that a national forum on agricultural education must be formed, serving as a task force to revitalize the total system of agricultural education. Recommendations are given for strengthening of agricultural education at all levels. Enhancing the linkage between formal and non-formal education is also recommended.

Keywords: Agricultural Education, Agricultural Development, Educational Policy, Thailand

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Introduction

Over the past four decades, agricultural growth in Asia has been dramatic as a result of the Green Revolution rushing into the region during the 1960s and 1970s. The Asian developing countries in particular have experienced a rapid expansion in agricultural exports since the mid-1970s (Itagaki, 1999). However, in this present period of post-green revolution, progress on biological technology, increasing pressure on environmental problems, and high competition in international trade, altogether have a major impact on agricultural system of Asian developing countries.

Given the challenging milieu of tomorrow, agriculture and agricultural education in Asia needs to be redefined and revolutionized. In regional forums, re-engineering of the agricultural education system has been echoed, and new models of agricultural education are sought for better functioning in a wider parameter of multi-functional agriculture (Mancebo et al., 2002). In so-doing, there is an urgent need for the region to “diagnose the root problems of the system, examine its strengths and weaknesses and project a future scenario to develop/or improve a responsive agriculture education system.” (Mancebo, 1999).

The food-production cluster is significant to the Thai economy. Agricultural production and related industries contribute to over 50 per cent of the nation’s economy (Falvey, 2000). Since the nation’s first commencement on social and economic development plan (1958-1964), agricultural development has continued to rank in the top priority of national policy. Although economic growth has been increasingly significant in the industrial sector over the recent decade, agriculture remains an important part of the national economy and the Thai culture.

Along the road to “modernization,” the major economic crisis of 1997 evidently stirred up an intense awareness of critical problems that have accumulated from the four decades of mainstream path to development. Lending his thought to alleviate the crisis, King Bhumibhol issued his prominent philosophy of “sufficient economy,” calling for the nation to seek alternative approaches to development, with the goal of self-reliance, a balance of social and economic sustainability and contentedness. The King’s philosophy has been well received by policy makers, academic professionals, and concerned development agents, prompting an agenda on a balanced direction of national development.

Following the King’s noble advice, there was a felt need for rethinking of the country’s direction in agriculture. As a consequence, the latest national plan for agricultural development (2002-2006) has thus shifted emphasis from development that relies solely on the mainstream agriculture to a more balanced “dualistic approach” of Thai agriculture. Under this renewed direction, there is competitive “export-oriented” agriculture on one side, and “sufficient agriculture” for small-scale farmers on the other (Ministry of Agriculture, 2002).

Reviewing the past developments of Thai agriculture, Lindsey Falvey, a regional expert on agricultural development, noted that the future of Thai agriculture depends on its quality of education, general as well as agricultural education (Falvey, 2000). Agricultural education must therefore be re-oriented to serve the future direction of Thai agriculture.

Beginning in the year 1999, Thailand has embarked on a holistic educational reform. To achieve the goal of this reform, policy research is needed in all areas of education to elicit information required for strategic planning. Perceiving the significant role of agricultural education in fostering agricultural development, the Thailand Research Fund (TRF) initiated a nationwide study entitled “A Critical Review: Status and Prospects of Agricultural Education in
Thailand.” Aiming for policy implications, the study examined holistically the system of agricultural education in Thailand.

**Purpose and Objectives**

The purpose of this research was to review the status and prospects of agricultural education in Thailand. The end-result was policy recommendations for agricultural education that is responsive to the changing contexts of national development. The objectives were:

1. Review historical developments of agricultural education in Thailand, and to determine factors associated with the past developments as well as the lessons learned.
2. Examine the current status and prospects of agricultural education in Thailand.

**Methods**

Agricultural education in this study refers to formal education in agriculture delivered at three levels; namely, basic education, vocational education, and higher (tertiary) education. The study was conducted during the years 2003-2004. The research process consisted of three consecutive steps. Extensive documentary analyses set the stage for subsequent in-depth empirical analysis. Reflective accounts, secured from opinion leaders, further enriched the findings (Figure 1).

![Figure 1. The research process.](image-url)
Each step of the research process is described as follows:

**Documentary Analysis**
Documents on past developments of agricultural education were extensively reviewed, dating back to the 1950s period when the country opened up for a “modernized” approach to national development. Documents on the current prospects of agricultural education were further reviewed. The documents consisted of policy and plans issued by the government, historical accounts, research reports, philosophical and concept writings, secondary sources of statistical data, and international documents available on the Internet. Content analysis was performed on the documents.

**Empirical Analysis**
Findings on status and prospects of agricultural education were obtained through the following methods:

- **Initial survey.** An institutional survey was conducted to obtain an overview of current status from organizations/institutions in charge of providing education in agriculture. Information was collected first from the available Internet sources, followed by mail and telephone correspondence. Brief descriptive data on existing educational programs were obtained from college deans of agriculture in 10 public universities, directors of 3 vocational colleges of agriculture, and the head of information services in the Ministry of Education. In addition to primary data, secondary data were extensively obtained at this stage. Providing wide-angle information, the survey was helpful in the further refinement of research questions and selection of key informants as well as case studies.

- **Interviews of key informants.** In-depth interviews were conducted from 43 leaders in agricultural education, agricultural development and agricultural business. Identification of key informants was achieved from the initial survey together with snowball sampling. Direct contact of the researchers with the respondents allows meaningful dialogues, assuring richness and validity of data.

- **Case studies.** Twenty-three case studies of schools and educational institutions were secured from in-depth field study by the researchers. Using a multi-case/multi-site approach, the 23 cases were purposively selected, yielding diversified samples of 10 schools, 3 vocational colleges in agriculture, and 10 universities. To maximize sample diversification, the following criteria were used: 1) school educational level, affiliation, size, and type; and 2) affiliation, development level, and structure of colleges and universities.

Both researchers were directly involved in the actual field study of all 23 cases. A multi-methods approach was employed for data collection in each case study, as follows:

1. **In-depth interviews of instructors, administrators, parents and community members, local wisdom farmers, and engaged educational researchers.**
2. **On-site observations of agricultural activities in the sample schools, vocational colleges, and universities.** Documents on curricula and agriculture programs were also collected.
3. **Attitude surveys of students at each level, supplemented with individual/group interviews of selected students.**

Methods of triangulation provided a validity check for results from each case study. A total of 3,781 participants took part in the case studies, providing information in one way or another. Data from case studies were analyzed with content analysis and descriptive statistics.
Reflections from Opinion Leaders

A forum of 39 opinion leaders was conducted in order to secure reflections on preliminary research findings of this study, and for the participants to share their thoughts on policy implications. The opinion leaders were purposively selected from all parties concerned: agricultural educators, local wisdom teachers, agricultural business, and government as well as non-government leaders in agricultural development. Some of the opinion leaders were selected during the interviews with key informants. The others were identified from consultations with key personnel in each sector.

Findings and Discussion

Historical Profile of Agricultural Education in Thailand

Basic Education in Agriculture. Over a century ago, dating back to the year 1898, formal agricultural education was first established in primary schools under the provision of compulsory education. Basic education in agriculture began with school gardening in elementary schools for the purpose of orienting students with fundamental agricultural knowledge and practices as a way of life. Notably, specialized schools were set up for training of agriculture teachers to carry out the teaching of agriculture in elementary schools. However, the teacher-training project was ceased after a decade due to an abrupt change in educational policy as well as budget limitations.

Later developments of basic education in agriculture were mostly influenced by the U.S concept of agricultural education. Among the most prominent is the “comprehensive school” model, which was implemented in secondary schools in 1967. Once again, the project was short-life due to a subsequent change in educational policy.

Vocational education in agriculture. Extending from the early vocational education delivered in primary and secondary schools, vocational education in agriculture was later delivered in specialized vocational colleges of agriculture. The 1970s was considered the “high time” of vocational education in agriculture with a rapid proliferation of agricultural colleges in response to high demand for vocational manpower in the government sector. The three corner stones of vocational agriculture “classroom teaching-learning, an organization for students (FFA), and supervised agricultural experience” have been adopted as a core model for Thai vocational agriculture with the mixed outcomes of success and failure.

Higher education in agriculture. Inspired by the US land-grant model, contemporary era of agricultural education in Thailand began in 1943 with an establishment of the first university specialized in agriculture. Stimulated by the green revolution of the 1960s and 1970s, agricultural education during that period expanded rapidly to meet the nation’s demand for manpower and technology.

The past two decades saw a proliferation of public universities offering programs in agricultural sciences and related disciplines. The programs vary distinctively according to the background of universities, grouped into 3 categories: the existing comprehensive universities, newly up-lifted universities with vocational foundation, and newly up-lifted universities with teacher training foundation. Presently, nearly all of the total 74 universities offer programs in agriculture or related sciences.

Over the past 100 years, agricultural education has evolved with noted policy fluctuations. Significant factors contributing to past developments are: 1) vision of the fore-founders and supportive political wills; 2) the green revolution movement in the region during 1960s and 1970s; and 3) international supports, heavily influenced by the United States of America. Table 1 summarizes the development path of agricultural education in Thailand.
Table 1

**Major Developmental Periods of Thai Agricultural Education**

<table>
<thead>
<tr>
<th>Years and Periods</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1898: Formative</td>
<td>Following the compulsory education mandated in 1898, formal education in agriculture was first established in primary schools. Agriculture teacher training was initiated.</td>
</tr>
<tr>
<td>1960: Green Revolution</td>
<td>Agricultural education, especially at higher level, was boosted by the demand for manpower and technology to meet the green revolution. The U.S. model of agricultural education was adopted.</td>
</tr>
<tr>
<td>1978: Proliferation</td>
<td>Unfocused expansion of vocational and higher education in agriculture in expectation of manpower demand by the government sector.</td>
</tr>
<tr>
<td>2002: Re-structuring</td>
<td>Agricultural education under pressure to change influenced by the country’s holistic reform in education and renewed direction in agricultural development.</td>
</tr>
</tbody>
</table>

**Impact of Agricultural Education**

*Primary Impact: Development of Human Resources and Technology.* Impact of the green revolution on Asian agriculture located in Monsoon areas has been well documented (Itagaki, 1999). In the case of Thailand, the green revolution rushing into the country during the 1960s and 1970s changed the face of Thai agriculture from subsistent farming to commercial/export-oriented agriculture. Agricultural education has been instrumental to the country’s agricultural development by “producing people to produce technology,” contributing significantly to the success of Thailand as a leading food exporter of Asia.

*Secondary Impact: Social Aspects of Mainstream Development.* With exception of Japan and South Korea, agricultural colleges and universities in Asia were originally inspired by the U.S. land-grant model with the trilogy of mission—teaching, research, and outreach/extension. In a review of agricultural colleges and universities in Asia, Bernado (1985) pointed out that attempting to adopt the land-grant mission resulted in varying degrees of success. A considerable success was noted in the case of India. In most other cases, the coordination of research and extension was hindered by the country’s organization structure carrying the mission in agricultural development. Another UNESCO regional survey revealed that much of the information generated from research by universities and colleges did not reach the intended users, primary the farmers (Saguiguit, 1987).

A similar scenario was observed in the case of Thailand. As respondents in this study, senior professors from leading colleges of agriculture recalled the strong orientation of the land-grant mission in the establishment of the first agricultural university. One prominent professor noted:

> In Thailand, research and extension in agriculture is the responsibility of Ministry of Agriculture. Unlike in the U.S. system, there is no effective linkage between colleges of agriculture and the ministry to cooperatively carry out the functions. So, as time goes by, we [college professors] tend to lose our sense of research-extension mission.

Outreach is a university function expected most by small-scale farmers. When colleges of agriculture cannot fully meet...
such expectations, the issue of educational relevance is often raised. Local wisdom farmers and NGO workers likewise echoed the question of “agricultural education for whom?” Cited below are some of the reflections secured in this research:

“From the first National Education Plan [1960], the university people have produced personnel and technology to serve primarily the demand of agribusiness rather than the needs of small-scale farmers.”

“The gap between the rich big farmers/agribusiness and the small-scale farmers are more and more widened.”

“Shifting to commercial agriculture, small-scale farmers have lost the love of land together with the sense of self-dependency.”

The cited comments center on the issues of equity and access to agricultural development, an often cited secondary consequence of the past green revolution (Jit-sanguan et al, 2001). GDP alone is not accepted as a valid indicator of development. Using SDI (Sustainable Development Indicator) in his analysis, Uan-Sakul (2000) concluded that the decade of development prior to the 1997 economic crisis in Thailand did not contribute substantially to the uplifting of farmers’ quality of life and sustainability of environment. On the contrary, over the 35 years of the past 7 national development plans, a gap in income distribution between agricultural and non-agricultural sectors jumped from a ratio of 1:6 to 1:13. This wide gap is an indicator of adverse impact of agricultural development on the agricultural population, particularly the small-scale farmers.

A principal consequence of development programs on small-scale farmers has received much attention in the recent years. But is agricultural education to blame? “There are various factors involved in the sustainability and well-beings of farmers. Why should agricultural education be the culprit after all?”, asked some respondents from colleges of agriculture. To the same question, local wisdom farmers had this to say:

“Who have benefited most from our agricultural education? Surely, not the majority farmers. Agricultural education has not been responsive to our real needs...”

“What is taught in schools and colleges is not relevant to the reality of Thai agriculture and Thai farmers.”

The dilemma of educational relevance may be viewed differently from another angle. Key informants in the agribusiness sector admitted that agricultural education has contributed greatly to the growth of agribusiness in Thailand since the 1970s. However, at present teaching and research in colleges of agriculture do not link well with what exist in reality. In their opinion, graduates today are not adequately prepared for the world of work in Thai agriculture, let alone to be part of competitive agribusiness on an international scale.

In sum, the impact of agricultural education thus far has been evident on development of human resources and technology. The social impact—responding to the needs of the agricultural population, is much in question.

Status and Prospects

The existing system of Thai agricultural education is described at three levels. Basic education in agriculture. At basic level, agricultural education is included in the general education curriculum for grade 1 to 12 students. As part of the existing educational reform, a new curriculum for basic education was implemented in 2001 with more emphasis given to academic subjects in the expense of
time allotted for vocational subjects such as agriculture.

On a positive side, within the realm of the on-going educational reform, exemplary cases of school agricultural programs could be identified from documentary sources and field data in this study. Eight illustrative cases were grouped as follows: 1) active learning through agriculture-based integrated curriculum; 2) agricultural activities for the socially/economically disadvantaged learners in rural areas; and 3) sustainable agricultural projects nurtured by external supports.

Success factors identified from these cases were: 1) school readiness, with committed agriculture teachers and supportive administrator, 2) community support from the school board, parents, community leaders, and local wisdom farmers, and 3) external inputs in funding and other supports provided by various parties involved.

Contrary to the positive cases, irrelevant and non-stimulating agricultural education characterized the more typical scenarios found in this study. Constraints in such cases were attributed mainly to school-limiting factors and lack of support for agricultural learning resources. New problems also emerged, associated with weak links in the recent curricular reform with more emphasis in general “academic” education, resembling the “return-to-the basics” phenomenon.

Table 2

<table>
<thead>
<tr>
<th>Strengths/Opportunities</th>
<th>Weaknesses/Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>The current movements in learning reform encourage a favorable environment for relevant agricultural education.</td>
<td>Limitations hindered by the curriculum reform</td>
</tr>
<tr>
<td>Design of community-based curriculum in agriculture</td>
<td>An orientation toward “return-to-the basics.” Agricultural education in the new curriculum is reduced.</td>
</tr>
<tr>
<td>Involvement of community members, especially local wisdom in agriculture</td>
<td>Weak mechanism at school level to assist teachers in management of school-based curriculum that is relevant to the community needs</td>
</tr>
<tr>
<td>Local network for learning, actively stimulated by government and non-government organizations</td>
<td>School-limiting factors:</td>
</tr>
<tr>
<td></td>
<td>o Lack of well-trained agriculture teachers and adequate learning resources</td>
</tr>
<tr>
<td></td>
<td>o low attention/support from school administrators</td>
</tr>
</tbody>
</table>

Vocational education in agriculture.

In Thailand, vocational education in agriculture is delivered primarily in 45 vocational colleges specialized in agriculture. Expansion of these colleges was the result of the proliferation during the 1970s and 1980s. Following the saturation of manpower in the government sector, the high time of vocational education in agriculture has passed. Vocational colleges of agriculture today are facing critical problems of declining enrollment and subsequent budget shortfalls. However, with their potential of reaching local clientele, vocational colleges of agriculture have played a key role in providing educational opportunity for the lower population of youth, mostly from the agricultural sector.

Falling enrollment has lead to a poor profile of entering students, and
subsequently a low funded budget. As an alternative for existence, these colleges have broadened their service area, extending to the more promising vocational programs such as business administration and computer education. In this regard, vocational colleges of agriculture are gradually moving away from its agricultural specialization, turning toward comprehensive vocational/technical education without adequate resources. This trend will have an adverse impact on future development of most colleges of vocational agriculture and the nation’s vocational manpower in agriculture.

Table 3

**Strengths and Weaknesses of Vocational Education in Agriculture**

<table>
<thead>
<tr>
<th>Strengths/Opportunities</th>
<th>Weaknesses/Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sound philosophical basis in vocational agriculture</td>
<td>• Limited learning resources, a consequence of the unfocused proliferation.</td>
</tr>
<tr>
<td>• Good educational infrastructure, accumulated from past developments to sustain vocational programs in agriculture</td>
<td>• Poor profile of entering students (quantity/quality)</td>
</tr>
<tr>
<td>• Strong tradition in community outreach</td>
<td>• Critical budget shortfall, limited resources and experiences to cope with new areas of education in agriculture</td>
</tr>
<tr>
<td></td>
<td>• Unfocused direction, a result of expanding service areas to non-agriculture programs</td>
</tr>
</tbody>
</table>

**Higher education in agriculture.** Of the 74 public universities in Thailand, 24 established universities offer academic-oriented programs in agricultural sciences. Most of the other uplifted universities offer practical-based programs. Analysis of higher education in agriculture reveals the following issues.

**Program diversity versus quality standard.** Programs in agricultural sciences were characterized by diversity among universities with different foundations and different stages of development as previously mentioned. The strength of such diversity is the potential of higher education to meet the demands of a wide-range clientele and in technology development/adaptations at various levels of use. However, concern was raised among the university respondents on the issue of the quality standard—competition is more evident on quantity, less on quality.

**Significant constraints.** The major constraints facing higher education in agriculture were identified. First, despite the proliferation of degree programs offered by universities, declining interest in the conventional agricultural sciences has been evident in the recent decade. This subsequently leads to a decrease in number and quality of students entering agricultural programs. The problem is more critical in less prominent universities where dropout rate has increased each year. Secondly, there is an observable decline in the quantity and quality of professional resources, a task force needed to carry further the educational mission. As a case in point, the coming decade will see a loss of critical mass, up to 30-50% of senior professors in major universities, due to retirement. Only partial substitution is anticipated. Thirdly, universities are under increasing pressure to become more self-reliant, following the government policy on public university autonomy. Anticipation of financial tightness has lead to a widespread commercialization of agricultural programs, a move toward the “market-driven model.” Extra income is also a major incentive for many faculty members to move into this direction. Key informants in this study
expressed their concern that this trend would have a significant impact on the equity and opportunity of prospective students, especially for the lower population.

Loosened sense of mission. In principle, most universities with colleges/programs in agriculture shared a common guiding philosophy based on the US land-grant mission. In practice, however, the sense of mission has evidently deteriorated. The trend has much in common with the market-driven dilemma facing the US land-grant institutions (Hutchinson & Elliot, 2004).

Table 4 summarizes strengths and weaknesses of the existing system of higher education in agriculture. From dialogues with the research participants and opinion leaders, it was evident that agricultural professionals perceived the aforementioned pertinent problems. Several solutions were explored through academic forums in recent years. However, strategic movements were lacking in adapting to the rapidly changing circumstances. Colleges of agriculture in leading universities, the corpus of the system, have not taken adequate initiatives in reform movements.

Table 4

<table>
<thead>
<tr>
<th>Strengths/Opportunities</th>
<th>Weaknesses/Constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sound philosophical foundation; guiding the mission on teaching, research and outreach, inspired by the US land-grant model</td>
<td>• Diversity in program quality caused primarily by unfocused proliferation of universities/degree programs in agriculture</td>
</tr>
<tr>
<td>• Quality of existing resources in the well-established universities, serving as the nucleus for development of the more recent universities</td>
<td>• Anticipation of budget shortfalls leading to:</td>
</tr>
<tr>
<td>• Diversity of programs in agricultural sciences serving the varying needs of manpower and technology development</td>
<td>o Widespread commercialization in agricultural education</td>
</tr>
<tr>
<td></td>
<td>o Decrease in the equity of access to higher education of the disadvantaged population, especially farmer youths.</td>
</tr>
<tr>
<td></td>
<td>o Functional imbalance, particularly on the sense of mission.</td>
</tr>
</tbody>
</table>

Conclusions

At the reflection forum of this study, the opinion leaders arrived at this conclusion: the new paradigm of Thai agricultural development has set the stage for alternative models of agricultural education. On the contrary, the system of agricultural education itself is still attached to the conventional rigid model of education.

Agricultural education worldwide shares the common “gloomy picture” of such problems as steady erosion of attention from policy-makers; declining enrollments; deteriorating infrastructure, unemployment of graduates, a changing profile of students/trainees (Maguire, 1999). This holistic study revealed that the system of agricultural education in Thailand is experiencing a similar problematic scenario, and that provocative movement is lacking.

Looking Ahead: Policy Implications

Education for the Future of Thai Agriculture

The strength of the Thai economy lies in the potential of its food production cluster. For a country with a distinctively dualistic society and economy, three dimensions of agricultural development must be considered holistically. These are agriculture for sustainable Thai society, agriculture for a sustainable economy, and
agriculture for a sustainable environment. In line with the recently established national plan for agricultural development, a dualistic approach of agricultural development is therefore reiterated:

- **Agriculture for competitiveness.** To be more competitive, export-oriented agriculture must be strengthened with the balance of economic and environmental sustainability.
- **Agriculture for sustainability of the Thai dualistic society.** Based on the lessons learned, agricultural development must sustain an equilibrium of “globalization-localization,” and “economic returns” of large-scale farmers, versus self-sufficiency” of small-holder farmers.

To be more responsive to this bilateral direction, agricultural education needs to be bi-functional, sustaining a well balance of academic and social relevance.

**Recommendations**

A concerted effort from the agricultural education community is needed in moving agricultural education forward. Two levels of recommendations are proposed herewith. At macro level: An “agricultural education forum” should be established. This task force of the professionals in agricultural education should assume the following responsibility:

1. **Formulation of a national plan for agricultural education.** Pertinent research and activities are needed to provide support for this prospective master plan. Some proposals are:
   
   A. **Formulation of an operational plan of dualistic agricultural development.** Active involvement is needed from agricultural educators, policy makers, private sectors, farmers, and government/non-government development personnel.
   
   B. **Analysis of manpower demands in agriculture leading to a master plan of manpower supply in the agricultural sector.**
   
   C. **Unit-cost analysis of educational programs focusing on vocational and higher level of education in agriculture.** The analysis will provide baseline data for budgeting.

2. **Formulation of a strategic plan for agricultural education.** A set of policy measures and key performance indicators should be defined.

3. **Determination of key channels and mechanisms for mobilizing the plan into action.**

At micro/institutional level:

**Basic education.** Agricultural education must be adapted to the new curricular structure. Through university-school networking, model curricular/model schools can be initiated for integration of agricultural content in other subject areas reflecting the variety of programs relevant to community contexts and needs of students. More support should be rendered for school programs that help to empower the disadvantaged population in rural areas. Emphasis should be placed more on the process of active learning such as good working habits rather than the outputs in farm products and income.

**Vocational education.** Expanding the service areas to non-agriculture programs must be carefully considered while maintaining the strength of the existing agriculture-based vocational colleges. To better function under increasingly limited resources, regional clustering of vocational colleges of agriculture is strongly recommended. The notion of a local-based center of excellence should be mobilized based on the strength of each existing college. More emphasis should be placed on an effective networking channel of serving.
the local clientele. Through academic initiatives such as small-scale and local-based R&D projects, community-based learning can be enhanced while meeting the real needs of the community.

Higher education. Well-established colleges of agriculture in major universities should take the lead in reforming the degree programs in agricultural sciences to be more responsive to the needs of the society. Keeping the “balance” is the key concept, some of which are suggested below:

Balance of mission (teaching, research and outreach). A strong sense of mission must be enhanced in the system of professional promotion and rewarding for faculty members. Viable linkage with Ministry of Agriculture must be strengthened in research and extension, particularly when dealing with small-scale farmers.

Balance of disciplinary orientation. For agricultural sciences to be most relevant to the needs of the country, balance in the content must be considered in such aspects as “specialized/integrated knowledge,” “import-based technology/local-based technology,” “mainstream agriculture/alternative agriculture,” and “conventional agriculture/hybrid agriculture.” To reinforce the balance, restructuring of academic units and innovative design of curriculum are needed. Funding for research projects must also take into consideration the balance of disciplinary orientation.

Balance of program diversity and quality. A quality forum should be set up to establish and foresee guiding principles and minimum standards to be imposed on degree curricula. The standards, however, should allow flexibility for program diversity among universities with different backgrounds.

Balance of “academic/social-driven” and “market-driven” models of education. The proposed quality forum should assume an active role keeping the balance on this aspect. Restructuring of resource management is needed for rendering quality programs. Furthermore, the profession must communicate explicitly to policy makers that higher education in agriculture runs the risk of losing the balance if unit-cost budgeting is strictly imposed without appropriate measures.

Balance of competition-cooperation. Horizontal as well as vertical networking of educational institutions should be strongly encouraged with a viable implementing channel. Area-based networking of institutions should be strengthened.

In addition to strengthening of formal education, enhancing linkage between formal and non-formal education is strongly recommended. Meaningful experiential learning for college students and faculty can be achieved through problem-based academic activities that link theory to practical reality of Thai agriculture. The activities can be blended into a compulsory component of degree program. In addition, a sense of social service can be enforced through small-scale interdisciplinary activities reaching target farmers and the local food industrial cluster. Networking between vocational colleges of agriculture and community colleges must be enhanced.

A detailed framework of policy strategies, with corresponding measures, was proposed in the full report of this research. To encourage further action, the full report was submitted to the National Council of College Deans in Agriculture.

References


Implications of an Extension Package Approach for Farmers’ Indigenous Knowledge:
The Maize Extension Package in South-western Ethiopia

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Abstract
This article is based on a study of the effects of a “maize extension package” on farmers’ indigenous knowledge (IK) in the Jima area of South-western Ethiopia. Both qualitative and quantitative approaches were employed to collect information from farmers, extension workers, and researchers. Initially, semi-structured interviews and discussions were used extensively to collect information. The structured questionnaires were administered to 80 randomly selected farmers and to 40 purposively selected extension personnel.

The study found that there is a rich wealth of indigenous technical knowledge and practices relating to maize production, though these appeared to be rapidly disappearing and are seriously endangered. Findings revealed that the promotion of modern practices in a package format played a major part in this regard with noticeable effect on local maize varieties and informal seed systems, traditional pest and disease control practices, control over produce and maize utilization. On the other hand, farmers, extension personnel and researchers were somewhat aware of the importance of farmers’ IK and the fact that it is at great risk, though the later two tended to favour modern technologies over IK. Age, gender, farming experience, and resource endowment were found to influence the possession and use of IK practices.

Based on the findings it was recommended that vigorous efforts should be made to identify, strengthen and integrate IK into formal research and development efforts to make them more relevant, effective and sustainable. To this effect, enhancing awareness, knowledge and skills at different levels; designing flexible programmes, strategies and methods combining IK and modern practices, should be given greater attention.

Keywords: Maize, Extension Package, Extension Approach, Indigenous Knowledge, Ethiopia
Introduction
Over the past decades, conventional development approaches have a track record of repeated failure as they excessively focused on technological solutions and “package type” top-down approaches without regard for indigenous knowledge (IK) systems and farmers’ practices. In particular, the drive to achieve agricultural development without taking into account IK systems and sustainable practices has proved socially, economically, and environmentally unsuccessful (Dommen, 1988). Hence, recently, there is an increasing recognition of the richness and value of rural people’s knowledge and the need to give due consideration to it, whilst planning and implementing development programmes. The role of indigenous knowledge has been emphasized in different international action plans and conventions. For instance, Nakashima and de Guchteneire (1999) stated “at the 1992 Earth Summit, clear reference to indigenous and local knowledge was inscribed in the Rio Declaration and Agenda 21” (¶ 3).

The role of IK lies in the fact that it optimally utilizes available resources, is readily available and less expensive, explores and exploits existing diversities, is environmentally appropriate, and provides livelihoods while appreciating the need to sustain the productive resource base (Brouwer, 1998; Warren, 1989). More importantly, the problems of development are too large and too complex for government and outsiders alone. If development is to take place and if it is to be sustainable, it must rest on the enterprise and initiatives of millions of people to generate change based on their own values and experiences (Tick, 1993). Thus, rural peoples’ knowledge can provide effective alternatives to modern scientific know-how. Moreover, a blend of scientifically generated technical knowledge with indigenous practices is flexible in that it can adjust to agro-climatic changes as well as the variable socio-economic conditions of farmers (Momen, 2000). Both are complementary in their strengths and weaknesses (Chambers, 1983) and combined they may achieve what neither would alone. In particular, the fact that farmers’ IK and practices are based on generations of experiences, are constantly tested, evaluated and adapted through a continuous process of experimentation and innovation makes them the best fit under circumstances referred to by Chambers as “complex, diverse and risk prone” (Chambers, Pacey, & Trupp, 1989), which is a typical feature of Ethiopia.

Despite this growing recognition, there is still a high dependence on external technological solutions in development programmes and projects that seek to improve agriculture and food production. This paper examines the interface between technology packages and IK in a rural area of Ethiopia.

Technological Packages for Agricultural Development
Like many developing countries, Ethiopia historically has concentrated efforts and resources on the transfer of packages of modern agricultural technologies, with implications for the poor, for indigenous knowledge and for sustainability. According to Sendeu and Mtwarra, (1994) hundreds of millions of subsistence farmers in developing countries have not been able to participate in the miracle of the ‘Green Revolution’ as they cannot afford to pay for irrigation, seed, agro-chemicals, fertilizers and farm implements. In general, rural people are paying a high price with the arrival of high input-output technologies in the form of natural degradation, social disturbances, increasing inequalities and unstable production systems (Naseem, 2000). Nevertheless, since 1994-95 Ethiopia has been implementing a new extension intervention that employs a ‘technology package approach’ in an attempt to attain food self-sufficiency through the aggressive promotion of packages of improved technologies to farmers.
Technologies developed by research are formulated into ‘packages’ at national level by the Ministry of Agriculture (MoA) and find their ways to farmers through local extension workers. Of all food crops, maize has received the highest attention due to its widespread cultivation and significance as a food crop (Tetse, Bedassa, & Shiferaw, 2001). Evidence from the local MoA in Jima indicates that the maize extension package ranks first both in terms of number of participating farmers and area coverage. The major components of the maize extension package are providing fertilizer, improved seeds (hybrids), pesticides, better cultural practices, credit for inputs, extension advisory services, and conducting demonstrations. The approach tries to channel a predetermined and fixed, complete set of technological requirements to all farmers, through a blanket recommendation across different socio-economic conditions. It does not allow room to incorporate farmers’ own technical knowledge based on experience and local situations.

Owing to the nature and limitations of the current extension package, some critics (e.g., Belay, 2000; Beyene & Abera, 2000) have questioned its effectiveness and sustainability. Shortcomings that have been highlighted include dependence on high cost external inputs; excessive reliance on a narrow genetic base; inadequate availability of inputs in the required quantity and quality for various socio-economic categories of farmers; and the consequences of continuous use of chemicals. Above all, it is argued that the excessive focus on the introduction of external technologies has contributed much to the neglect and erosion of local genetic resources and farmers’ IK systems. This last point was the focus of a study in the Jima area in 2002 (Negussie, 2002).

Objectives of the Study
The overall objective of the study was to investigate the diversity and prospects of farmers’ indigenous knowledge and practices with respect to maize production, and to examine the effects the maize extension package had on farmers’ IK systems. Obviously IK systems have many dimensions, including local technologies and local adaptations of technology, in fact, anything that has its origins within a particular area (Sen, Angell, & Miles, 2000). It includes such aspects as information, practices and technologies, beliefs, tools, materials, experimentation, biological resources, human resources, education and communication (IIIRR, 1996). However, the specific objectives of this study were to:

1. Identify the major indigenous knowledge and practices pertaining to maize production, their strengths, limitations and prospects;
2. Identify some of the major factors influencing knowledge and use of indigenous technologies and practices by farmers;
3. Examine the attitudes of farmers, extension personnel and researchers toward the role and importance of farmers IK; and
4. Examine the effects of the maize extension package (or components of the package) on farmers’ IK systems.

Methodology
The study was conducted in Kersa district, one of the major maize producing districts of Jima zone, South-western Ethiopia. Both qualitative and quantitative approaches were employed in this study.

One representative cereal producing district and three peasant associations (PAs) were purposively selected for the study based on the importance of maize in the farming system, their representativeness, and the intensity of the extension service received. Initially, purposive and accidental sampling techniques were used to select individuals and group informants for the
informal interviews and discussions. In this way, eight female farmers and 35 male farmers were selected. As a second phase, sampling frames were obtained from respective PA offices and farmers were stratified as participants, if they were participating in the programme in 2002 and as non-participants, those who participated in the extension package programme at some stage but who discontinued due to various reasons.

Eighty farmers (54 participants and 26 non-participants) were selected using a simple random sampling technique based on the proportion of the two categories in the sampling frame. In addition, 40 extension personnel—20 field level, 15 district and 5 zonal level extension staff—were selected. The selection technique used for the extension staff was purposive as they were few in number and thus the majority was interviewed. Four relevant researchers were also purposively selected and interviewed.

The data were collected using a variety of tools, methods and techniques. These, among others, included: key informant and group interviews, focus group discussions, transect walk, direct observation, and structured questionnaire. During the first phase, checklists and semi-structured interviews were extensively used. As a second phase, structured questionnaires were developed based on the information obtained in order to crosscheck and validate, and quantify some of the information.

The questionnaires were pre-tested on eight farmers and five extension personnel and administered by five junior researchers selected from Jima Research Centre, who could speak the local language. Semi-structured interviews were used for researchers. Existing documents were also used as secondary sources of data to supplement the primary data. Efforts were made to triangulate and crosscheck in order to ensure reliability of the information collected. Descriptive statistics such as measures of central tendency and dispersion; chi-square, t-test, and correlation coefficients were used in analysing the quantitative data.

**Findings**

**Local Maize Varieties and Seed Systems**

In terms of indigenous knowledge and practices, the use of local maize varieties and informal seed systems were the most important. The study revealed that respondent farmers in the study area cultivated different varieties of maize. The local varieties found in the area include: *Kenya, Oromee, Affillo and Araba*. All varieties have their own attributes and qualities and are needed by farmers for different purposes. Some of the features and attributes of these varieties are given in Table 1.
Table 1

**Local Varieties: Some Characteristics and Qualities**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Characteristics</th>
<th>Qualities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya</td>
<td>White kernel; Shorter plant height than other local varieties; Matures in four months.</td>
<td>Has got multiple use/advantage; Good taste; high flour to grain ratio; Relatively fast maturing; Responds to fertiliser; Relatively tolerant to weevil.</td>
</tr>
<tr>
<td>Oromee</td>
<td>Red or mixtures of red and yellow/white kernels; Small cob and grains, hence low yielder; Matures in three months; Hard grains – difficulty of grinding.</td>
<td>Fast maturing - supply food during hungry months; Good taste – highly preferred for consumption; Tolerant to storage pests.</td>
</tr>
<tr>
<td>Araba</td>
<td>White kernel; large cob and grain size; Softer grains/kernel; Susceptible to disease and storage pest; Leafy - high vegetative growth; Not tasty for consumption.</td>
<td>Gives relatively better yield – high kernel to cob ratio; Easy to grind with local flourmill or stone.</td>
</tr>
<tr>
<td>Affillo</td>
<td>Red or mixtures of red and yellow seeds; Longer maturity period – five months; Hard grains – known as mill breaker; Poor taste and palatability.</td>
<td>Highly resistant to storage pests.</td>
</tr>
</tbody>
</table>

The study found that the effect of the ‘maize package’ in the area was to radically reduce the number of varieties that farmers grow. As can be seen in Table 2, before the introduction of the ‘maize package’, 14% of the respondents used to cultivate only one maize variety, whereas at present 46% cultivate only one variety. Similarly, 58% of the respondents cultivated two or fewer varieties before the introduction of the maize package, while at the time of the study, 97% reported that they relied on two or less varieties. This indicates that rapid loss of maize genetic diversity has been taking place in the area.

Table 2

**Number of Varieties Grown by Farmers before the Maize Package and in 2002**

<table>
<thead>
<tr>
<th>Varieties Grown</th>
<th>Before the Maize Package</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14</td>
<td>46</td>
</tr>
<tr>
<td>2</td>
<td>44</td>
<td>51</td>
</tr>
<tr>
<td>3</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

In terms of types of variety grown, 27% of respondents grew only hybrid seed, while 29% grew both *Kenya* and hybrid seeds during the study season (Table 3). About 10% and 2% grew only *Kenya* or *Affillo*, respectively. None of the respondents were found to grow only *Oromee* or *Araba*. On average, about 6% grew *Oromee*, *Affillo* or *Araba* along with...
other varieties. Thus *Oromee*, *Afillo* and *Araba* seem to be highly endangered as their seeds have become scarce. In addition to the hybrid, farmers were more inclined to grow *Kenya* because of its relatively high yielding ability and response to fertilizer.

Table 3

**Maize Varieties Grown by Respondents during the Study Year (N=80)**

<table>
<thead>
<tr>
<th>Variety Types</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid</td>
<td>27</td>
</tr>
<tr>
<td>Kenya</td>
<td>10</td>
</tr>
<tr>
<td>Afillo</td>
<td>2</td>
</tr>
<tr>
<td>Oromee</td>
<td>0</td>
</tr>
<tr>
<td>Araba</td>
<td>0</td>
</tr>
<tr>
<td>Hybrid + local varieties (mainly Kenya)</td>
<td>29</td>
</tr>
<tr>
<td>Kenya + other local varieties</td>
<td>15</td>
</tr>
<tr>
<td>Oromee + other varieties</td>
<td>5</td>
</tr>
<tr>
<td>Afillo + other varieties</td>
<td>7</td>
</tr>
<tr>
<td>Araba + other varieties</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
</tr>
</tbody>
</table>

It was expected that those farmers who had abandoned the ‘maize package’ would be more inclined to use local varieties, and indeed the majority (70%) cultivated only local varieties (but mainly *Kenya*). Less than 4% mentioned growing *Afillo*, *Araba* or *Oromee* either alone or along with other varieties. However, about 22% cultivated second generation hybrid seeds in spite of the stringent warnings given by researchers and extension agents, implying a critical need for seeds that can be re-used for next planting. The remaining 8% shifted to other crops or contracted out their land to those who could afford modern inputs.

None of the respondents who abandoned the package grew more than two varieties in 2002, though close to a third reported that they used to maintain three or more varieties before the introduction of the package. Respondents pointed out that because of the huge advantages some elite farmers enjoyed during the initial years of the programme, most farmers abandoned the low yielding local varieties and shifted to hybrid maize. It was also noted that extension workers were advising them not to plant local seeds close to their package fields because of the cross-pollinating nature of the crop. This again led to the loss of the local varieties. Some wise farmers stated that they maintained their local seeds in distant highland areas where the maize package had not yet expanded. But those who dropped out of the package programme often found that they had nothing to fall back on.

When participation in the package programme and area of land allocated to local seed was examined, a significant association (*t*-value = -2.556; *p* = 0.013) was found between the two variables. Those who had left the ‘package’ allocated, on average, more than half a hectare to local seed compared with only a third of a hectare for package participants. This was not surprising as package participants are expected to devote most of their resources to package maize. In general, the study found that the maintenance of local varieties was mostly by skeptical farmers, who tended to fear risk, as well as by wise and older farmers. It was also interesting to note that resource-rich farmers maintain local varieties as their resources allowed them to cultivate both local and hybrid seeds. For instance, a significant association (*r* = 0.364; *p* = 0.003) was found between farm size and area allocated to local maize. Those with large farm size tended to allocate larger plots to local maize. However, farm size was not significantly associated with number of varieties grown.

In the study area, there used to be a wide range of practices and sources for local seeds though the primary source was the farmers’ own stock. In addition to household storage, the principal local seed acquisition mechanisms were gifts, market/purchase and exchange with other seeds. Traditionally it was common for seed to be given as a gift between relatives, friends or neighbours.
there were strong social obligations in this regard. However, informants explained that, in recent years, seed gifts had become less common because the maize extension package promotes expensive hybrid seeds, whose sole source is the highly centralized formal seed sector. For instance, with hybrid maize it was not possible for farmers to locally select, preserve or exchange seeds for several reasons.

Firstly, it was not possible to obtain hybrid seeds through locally available networks. Secondly, because of its hybrid nature, farmers could not preserve it for next season’s planting and they had to purchase it every year. Thirdly, given its high price and close supervision by extension agents, it was not possible to freely share package seed with others. Fourthly, owing to its high susceptibility to storage pests, it was not possible to protect it with local practices. Fifthly, the knowledge and expectation that package seed will be available from the MoA, has made some farmers reluctant to select and maintain their own seed. In general, since the introduction of the maize package, seed purchase has become the dominant seed securing mechanism, and in view of this reality, informants stressed that the package has caused dependence on external sources (such as the formal seed sector).

Impact on Planting Time and Methods

In the study area, land preparation is mainly done with local ox drawn ploughs and takes place between December and March. Time of land preparation and frequency of ploughing are determined by several factors including type of previous crop, rainfall, availability of labour and oxen, variety to be planted, type of soil, weed situation, and the purpose of the crop. Normally, planting of local maize takes place between March and April, though recently farmers have been influenced to change their planting time because of the extension package recommendation, change in weather conditions and the late delivery of fertilizer and seed. Farmers are expected to stick to research recommendations, which are to plant package maize in late April and May. This later planting had consequences for disease infestation, yield reduction and food supply. Farmers in the area practise both broadcasting and row planting for local maize.

Traditionally in Kersa, intercropping was common, yet the introduction of the ‘maize package’ did not incorporate this important practice. Local maize was intercropped with fast maturing crops such as haricot bean and local cabbage, but pulse crops have been almost abandoned due to diseases/pests and change in weather conditions, thus limiting farmers’ options.

Crop Management Practices

In the area, soil fertility has been declining over recent years due to monocropping, continuous cultivation and the use of inorganic fertilizers. Indigenous practices relating to organic fertilizers and different fertility maintenance techniques have become less common as farmers dependence on commercial fertilizers has increased. For instance, the vast majority (90%) of the respondents never used compost. A common traditional soil fertility improvement practice in the area was known as ‘balloo geederu’. It involves constructing temporary enclosures on different parts of the field and keeping cattle there for at least a week and then rotating until the whole field had received the same treatment. This practice is now abandoned mainly because of the decline in the livestock population. Nowadays, the use of animal manure is limited to plots around the homestead due to shortage of manure and labour, and because of its absence in package recommendations. It was noted that resource rich farmers were the ones most likely to use manure on local varieties used for green cobs.

Traditional crop rotation in the area involved planting maize for two or three years, followed by tef for one year and sorghum for another year, then leaving...
fallow for at least two years. Crop rotation has been increasingly abandoned because of the expansion of maize growing. Moreover, farmers have abandoned *tef* because of disease problems, leaving no compatible crop for rotation with maize. This underscores the critical need to identify and promote alternative crops for rotation. It was found that crop rotation was significantly associated with farm size rather than with involvement in the package. Larger holdings allow cultivation of various crops which can be rotated with maize. It was also noted that farm land scarcity and the introduction of fertilizer and improved seeds have led to a reduction in fallowing because of farmers escalating desire to cultivate large areas by using commercial fertilisers. Again, there was a significant association ($\chi^2 = 3.933; p = 0.047$) between farm size and fallowing practices as farmers with larger holdings were more likely to practice fallowing.

Interestingly, one area that has shown the successful ‘integration’ of local knowledge/practice with the modern maize package practice has been in weed management. The traditional maize weeding operation, known as *babbaqaa*, uses oxen for inter-row cultivation and takes place three times for local maize. According to farmers, the main purposes of *babbaqaa* include weed control, loosening the soil, maintaining the desired plant population, initiating brace roots, slowing down plant vegetative growth as well as covering the roots with soil to protect against lodging. After the last *babbaqaa*, farmers heap soil around the plants with a hoe. Finally, “*quncoo*” (slashing of weeds and weak/dead plants) is carried out at the flowering stage before silking. Though *babbaqaa* was not initially part of the package recommendations, farmers continued to practise it with package maize. Researchers have become convinced of the importance of the practice and now stress the need to recommend it with the package. Researchers stated that the practice also helps to prevent soil erosion and to retain soil moisture. Therefore, this could be one of the local innovations that prove the rationality of farmers thinking and the validity of their practices.

*Maize Pests and Disease Control*

The study found that farmers have a wealth of traditional practices for the control of maize pests and diseases. These focus mainly on protection against storage pests which cause serious losses and are the major threat to food security. They include the use of various botanical pesticides such as plant extracts or pastes as well as mechanical processes. However, these practices have come under threat as commercial pesticides have gained wider popularity. Farmers also reported that ‘package’ maize is highly susceptible to pests and that traditional methods are ineffective for it. This as well as the provision of commercial insecticides along with the maize package threatens the use of traditional pest control practices. During individual and group interviews it was pointed out that, younger farmers were more inclined to favour commercial pesticides, while older farmers were said to have rich experience and knowledge in traditional control practices. Poor farmers who cannot afford commercial pesticides also stick to these traditional practices. Women were also said to be knowledgeable in this area because of their dominant role in the grain storage process. It can be concluded from the observations and discussions made with farmers that traditional pest control practices were seriously endangered.

*Maize Harvesting, Storage, and Utilization*

Maize is the most important food and cash source for Kersa farmers and it is consumed both at the green and dry stages. The early maturing local varieties can be harvested for green cobs in July, while the main harvest of dry cobs is from October to December depending on the variety and time of planting. Most of the local varieties were early maturing as compared to the hybrid...
There are two common harvesting methods, one involves cutting the stalks before dehusking and the other involves removing cobs from the erect maize stalk. In the area, maize is commonly stored in a local store known as gonbisaa, which is made of interwoven sticks, raised a few centimetres above the ground. In the area, a variety of traditional dishes are prepared from green and dry maize including: Qixxaa, daabboo, biddeena, kijoo, harkiso, marqaa, danfisaa, and waaddii. Local varieties are used for most of the traditional foods prepared from green maize. Maize varieties differ greatly in their suitability for particular dishes and it was noted that a single variety could not fulfill all the requirements, thereby necessitating the maintenance of different varieties.

During discussions it was pointed out that women are not allowed to feed the family with package maize at the green cob stage. Women informants underlined the high value they assign to green maize as a relief during the hunger months; whereas men stressed that package maize should not be consumed until they had sold the quantity required for input loan repayment and other financial needs. Men also cautioned that, if they were to allow maize to be consumed green, it would be all consumed before reaching the dry stage. This would have serious consequences for household food security in the area. Moreover, some of the informants felt that the package programme has transferred more control over production and income to men as they are increasingly involved in marketing the output in the name of loan repayment as they are the registered head of household.

**Differences between Farmers, Extension Personnel and Researchers**

The attitudes of key actors—farmers, extension personnel and researchers—play a critical role in influencing the attention given to IK and efforts to make use of it. In this regard, it was observed that farmers accord different degrees of value and importance to various types of IK practices. Virtually, all farmer respondents (96%) felt that their local practices and varieties were displaced after the introduction of the package. The majority (94%) also indicated that they were worried about this displacement, which implies that they had positive attitudes, towards local varieties. In general, it was observed that farmers appreciate most of their traditional practices such as traditional pest control methods; local seed systems and some soil fertility management practices. Some of the advantages of local varieties that were stated included heavier grains, lower demands in terms of management and inputs, early maturity and resistance to storage pests.

Moreover, farmers were also aware of the limitations of their practices, especially, some of the traditional agronomic practices such as land preparation, planting and fertilizer application.

The majority (64%), of the extension personnel interviewed believed that farmers’ knowledge and practices have something to contribute to the effectiveness of research and extension. However, being influenced by the higher yielding ability of the hybrids, the vast majority of extension personnel (82%) believed that the maize extension package is more important to farmers than their indigenous practices and varieties. They were, however, concerned that farmers’ practices and local varieties were being displaced or eroded by the introduction of the package. Thus though being influenced by the perceived advantages of the package, the majority of the extension personnel, to some extent, recognized the value of farmers’ technologies and practices and that these were ignored in the package approach.

On the other hand, researchers had mixed views regarding the value and importance of farmers’ IK and practices. Most of them were of the opinion that modern agricultural technologies are far better and that farmers need to adopt them if they are to cope with the changing
environment. They tended to believe that local practices are backward and not productive, and thus have to be replaced. But surprisingly one of the researchers stressed that some of the farmers’ practices such as inter-row cultivation, seed selection and preservation practices are effective. He was also aware of some of the attributes of local varieties such as resistance to storage pests and better adaptation to local conditions and suggested that they should not be abandoned; but should be improved by research. He even felt that hybrid seeds alone could not address the diverse needs of farmers and thus there is a need for expanding alternative choices for farmers.

**Conclusion and Implications**

The study revealed that Kersa farmers have a wide range of IK relating to maize production and utilization, though much of this is being eroded. It became evident that no one has a monopoly on IK as it is not found in the form of a fully-fledged package. The most significant IK areas include local varieties and informal seed systems, pest control and storage practices, and to some extent, weed control, soil fertility management, and maize utilization. In general, the expansion of the maize package technologies such as hybrid seeds and other practices, coupled with low productivity of the local varieties, had contributed to the neglect and disappearance of farmers’ indigenous technologies and practices. Although farmers want to grow different varieties to fulfill their heterogeneous needs, they have become increasingly obliged to rely on a few varieties.

Of the local varieties, *Oromee, Araba, and Affillo* were at great risk, while *Kenya* seems to have a relatively promising future. With the introduction of the hybrid maize, the local seed systems and networks have also been weakened because of increasing reliance on external sources. The demand for local seeds and other open pollinated varieties has been escalating in the area. This calls for efforts to collect, preserve (mainly on farm in-situ) and improve these local varieties before they are completely lost. Above all, there is a critical need to devote substantial resources and efforts for research and extension of open-pollinated varieties. Moreover, as local seed channels are more accessible to the community, efforts should be made to integrate the formal and informal seed systems in order to enhance their effectiveness.

Traditional pest and disease control practices were also found to be endangered. The introduction of the maize package and commercial pesticides seriously threatens these practices. Thus, there is an urgent need to record, document and conduct studies to determine their efficacy and to further strengthen and disseminate best practices to users. The status and use of alternative soil fertility management practices were not encouraging and farmers have become overwhelmingly dependent on commercial fertilizers. Lack of compatible crops for intercropping and crop rotation, absence of other fertility management practices in the maize package, falling livestock population, expansion of maize area and commercial fertilizers were the major bottlenecks to these practices. In particular, the declining fallowing practice and rocketing price of commercial fertilizers necessitate the search for and promotion of other fertility management practices. The influence of the maize package was also evident on maize utilization and control. In general, efforts have to be made to make the extension package flexible in order to incorporate local knowledge and practices.

On the other hand, both farmers and extension personnel were somewhat aware of the importance of farmers’ IK and the fact that it has been undergoing rapid displacement, implying that there is some concern about its disappearance. However, the extension personnel and researchers were inclined to view modern technologies as the primary remedy for farming
problems. Thus, efforts should be made to raise awareness, understanding, and appreciation of the value and potential of IK in research and development by organizing various fora and by incorporating aspects of IK into the curricula of agricultural learning institutions. Parallel to these actions, efforts need to be made to enhance the development of skills in the use of methods and techniques for identifying, recording, preserving and utilizing IK in research and extension programmes; which of course requires a supportive policy environment.

References


Exploring the Quality of Life of Farm Families in Ireland: Implications for Extension

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Abstract

Quality of Life is commonplace term, which is rarely adequately defined. The complexity of the concept and its interpretation pose challenges for measurement. The improvement of the quality of life of farm families is an aim of the Teagasc Planning Post Fischler Programme. The primary aim of the research in this paper was to establish a baseline measure of the quality of life of farm families. A secondary research aim was to compare the quality of life of farm families with others. The research survey was carried out with 344 families (farm, non-farm rural and urban). Quality of life was defined as the perception and feeling about one’s current life experience (including family, social, economic/work, personal development/success). Farm families work longer hours and have greater income uncertainty but, overall there was no significant difference between their quality of life and that of rural and urban dwellers. The findings regarding a number of key factors relating to quality of life are documented. In order to derive a comparative measure of quality of life a ‘life quality index’ was constructed. The index included variables relating to: social activities; involvement in organisations; attitudes towards incomes; expenses; borrowings; hours of work; life; and quality of life. The research findings serve the purpose of informing extension agents about quality of life and providing a baseline for future measurement.

Keywords: Quality of Life, Farm Families, Extension

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Introduction

‘Quality of Life’ is a term that is increasingly used in society but is rarely adequately defined. The complexity of the concept of quality of life and the way in which it is interpreted poses a serious challenge for measurement. One of the aims of the Teagasc “Planning Post Fischler Programme” is the improvement of the quality of life of farm families. This study assesses the quality of life of farm families and compares their quality of life with rural non-farm and urban families. The farm families were participants in the Planning Post Fischler Programme. A number of key implications for extension services, both national and international are presented.

The Irish agricultural extension service (Teagasc) restructured itself in the 1990’s to meet changing circumstances (changes in the Common Agricultural Policy) (Phelan, 1998). The service adjusted itself once more at the beginning of the new millennium to account for further changes in the farming environment. The technical and direct payments focus of the advisory service in Ireland resulted in the social and family issues being somewhat sidelined and the “bigger picture” of the overall direction of the farm and household unit being lost. The holistic approach adopted in this programme (Opportunities for Farm Families) involved the farm family and looked at the wider family and household issues (Bogue & Phelan, 2004).

Planning Post Fischler Programme

The Planning Post Fischler Programme (originally called the Opportunities for Farm Families Programme) was introduced in 2001 and has three distinct stages. Stage 1 is delivered by way of two facilitated group discussion meetings in which farm families identify their main household viability concerns and explore possible options (on/off-farm). Stage 2 involves options analysis leading to the development of a “Way Forward Action Plan.” Specific measures to improve income/quality of life are identified by the family in conjunction with an adviser. Specific advice and training needs of the family are identified and referrals made to other agencies. In Stage 3 the farm family implements the actions specified in their plan (Teagasc, 2004).

Influences on Quality of Life

The influences on quality of life are infinite as they can include any aspect, which affects an individual’s life. Many misconceptions have been built up around the links between income, standard of living and quality of life. Most researchers reinforce the view that quality of life while linked to income is not determined by income. Irish research (Amarach, 2002) agrees with this conclusion that a person’s reported sense of their financial circumstances does directly impact on personal quality of life, but the impact is far more modest than that of emotional, family and physical goodness. However, Malkina-Pyk (2001) stated that “those who perceive their general situation as bad have a lower quality of life” (p. 12). Similarly Wilkening and McGranahan (1978) found that a person’s subjective evaluation of their income, how they feel about their income was a better determinant of their life satisfaction and happiness than such objective measures as gross income.

Measurement of Quality of Life

The nature and meaning of “quality of life” poses many challenges for its measurement. The term “measurement” in the physical sciences conveys the impression of a precise operation based on established procedures, carried out in controlled settings and producing results, which are expressed in terms of standardised units. This scenario contrasts markedly with the attempts of social scientists to develop measures of quality of life (Kind, 1990).

“Satisfaction with one’s life is strongly related to one’s expectations of it. Expectations in turn are related to social
position: people compare themselves to others in their self-perceived social position” (Malkina-Pykh, 2001, p. 8). The notion of measuring the quality of life could include the measurement of anything of interest to anybody.

Atkinson and Zibin (1996) commented that there is a lack of agreement on definitions and measurement which primarily stems from two competing theoretical views of the determinants of life quality, namely the functional (objective) perspective and evaluative (subjective) perspective. Objective refers to variables or measures that can be simultaneously observed by a number of people and involve estimates of frequencies or quantities. While all such estimations involve varying degrees of judgement, they constitute a measure, which at least in theory, and with sufficiently careful attention, could yield a high degree of agreement among people making the rating (Powell, Mercer, & Harte, 2003). Subjective refers to variables or measures that are based on an individual’s evaluation of the impact of events on their physical, social and/or emotional functioning, or alternatively, their rating of importance and satisfaction with various life experiences. This approach differs from objective measurement, in that subjective measures are evaluative appraisals of subjective qualities of experiences and not quantification of actual experience (Atkinson & Zibin, 1996). Most researchers suggest that quality of life measurement should be predicated on a combination of objective data and subjective assessment. Rosenblatt and Attkisson (1993) state that depending on its intended use, a well-rounded instrument should assess a number of life domains, including a person’s biological, interpersonal, social and economic experience.

Defining Quality of Life

One of the most commonly accepted definitions of quality of life is that of the World Health Organisation (WHO, 1997): Quality of Life is an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person’s physical health, psychological state, personal beliefs, social relationships and their relationship to salient features of their environment. (p. 13)

Quality of life reflects the difference, the gap, between the hopes and expectations of a person and their present experience. Powell et al. (2003) sum up quality of life as a person’s subjective sense of well being derived from current experience of life as a whole. However, Malkina-Pykh (2001) states that because quality of life depends on the individual’s perspective and outlook on life, it is not possible to precisely define quality of life, she suggests a definition of quality of life “as a set of conditions relating to an individual’s life that would appear to indicate, from the outside, that it is going well” (p. 8).

Based on the exploration of the definitions provided in literature, it was possible for the purposes of this study to define quality of life as the perception and feeling about one’s current life experience including family, social, economic/work, personal development/success)

Purpose

One objective of the “Planning Post Fischler Programme” is to improve the quality of life of farm families. In order to assess the impact of the programme in terms of changes in quality of life, it is necessary to have a baseline measure. However, there were no measures/indicators set out by Teagasc on which to assess the programme.
impact. Therefore the primary purpose of this research study was to establish a baseline measure of the quality of life of farm families participating in the programme. A secondary research purpose was to compare their quality of life with others.

Research Methodology

Evaluation of extension is necessary to determine its value and impact. However, the evaluation must not detract from or negatively impact on the actual delivery of the advisory programme. Methods must be practical, simple and straightforward, yet deliver practical and useful results. In this study, it was decided that research questionnaires were the most appropriate method of assessing quality of life. Also, previous research has found that simple measures of quality of life correlate highly with more sophisticated measures (Economic Intelligence Unit, 2004).

Research questionnaires were developed taking account of national and international research. The questionnaires contained a mix of open and closed questions on practices and behaviour and attitudinal scales. The focus of the questionnaires was on the personal, farm/job and household characteristics, social interaction & behaviour, and attitudes of families. While many other domains and aspects of domains were identified in the literature, the measures focused on in this study were specific because of the realities of collecting the information with farm families – information was collected during programme sessions and the completion of the survey was dependent on farmer participation (and the cooperation of extension agents), therefore, it had to be “user-friendly.”

The questionnaires were piloted and modified accordingly. The research data was collected with farm families by way of a self-administered questionnaire (during Stage 1 of the Planning Post Fischler Programme). Participants were guided through the completion of the questionnaire by the researcher. A total of 153 participants were surveyed in nine counties – this represents 10% of the farm families who participated in the programme stage 1 during the data collection time-period (October 2003-February 2004). The sample locations were randomly selected throughout the country. A sample of non-farm households (urban and rural non-farm) was selected at random from the telephone directory. A telephone survey was carried out with this sample. A total of 93 non-farm rural households and 98 urban households were surveyed. The specific purpose of the non-farm sample was to provide an indicator of the quality of life of the general public; it was not intended to be a representative sample of the Irish population. The data was analysed using the Statistics Package for the Social Sciences (SPSS).

The authors recognise that there are limitations to the research presented in this paper. The individual sample populations are small and more factors could be included in determining the quality of life. Nonetheless, the research provides an overview of the key factors, which influence the quality of life of farm families and how farm families compare with other families.

Results

The key findings from the research are presented in this paper relating to: hours of work; family finances; social interaction; and quality of life (in presenting and discussing the results, farmers includes both male and female unless specifically identified as either male or female).

Hours of Work

Farmers (male) worked more hours than their rural non-farming neighbours and urban dwellers (Table 1). Male part-time (with off-farm employment) farmers work the greatest number of hours overall per week (78 hours). The hours spent working in the household are rarely included when measuring individuals’ work hours, however
it was considered important in this study because it is time that rarely can be compromised or indeed reduced. In many cases, the male respondents initially dismissed this time but when it was explained that it included school runs, child/elder care and care of family members with disability/health problems, it became apparent that it was an important factor, worthy of assessment.

Table 1

**Hours of Work per Week for Male Respondents (Employed and/or Working in Household)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Hours Worked per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Farm</td>
</tr>
<tr>
<td>Farmers&lt;sup&gt;1&lt;/sup&gt; (n = 129)</td>
<td>52.5</td>
</tr>
<tr>
<td>Full-time&lt;sup&gt;2&lt;/sup&gt; Farmers (n = 91)</td>
<td>58.5</td>
</tr>
<tr>
<td>Part-time&lt;sup&gt;3&lt;/sup&gt; Farmers (n = 38)</td>
<td>38.2</td>
</tr>
<tr>
<td>Urban Dwellers (n = 33)</td>
<td>-</td>
</tr>
<tr>
<td>Rural Non-Farm (n = 31)</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note:*<sup>1</sup> Household includes all work related to and associated with the household: general housework; household repairs and maintenance; school runs; child/elder care; and caring for someone with poor health/disability; <sup>2</sup>No off-farm employment; <sup>3</sup>With off-farm employment.

Women worked fewer hours in total than men with the exception of farm women who worked 5 hours more per week than farm men (Table 2). The non-farm rural women worked the greatest number of hours in the household while the urban women worked the greatest amount of hours in employment. Three out of every five (60%) rural respondents were satisfied with their hours of work, while 46% of urban residents and 45% of farm respondents felt likewise (Pearson chi-square = 10.31, df = 4, p = 0.036).

Table 2

**Hours of Work per Week for Male and Female Respondents (Employed and/or Working in Household)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Hours Worked per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Farm</td>
</tr>
<tr>
<td>Farm</td>
<td>Male (n = 129)</td>
<td>52.5</td>
</tr>
<tr>
<td></td>
<td>Female (n = 17)</td>
<td>28.0</td>
</tr>
<tr>
<td>Rural Non-Farm</td>
<td>Male (n = 31)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Female (n = 33)</td>
<td>-</td>
</tr>
<tr>
<td>Urban</td>
<td>Male (n = 33)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Female (n = 41)</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note:*<sup>1</sup> Household includes all work related to and associated with the household: general housework; household repairs and maintenance; school runs; child/elder care; and caring for someone with poor health/disability.
Family Finances

Irish Household Budget Survey data (CSO, 2002) indicates that urban households had an average disposable income of €586/week in 1999/2000, €17/week more than farm households (Table 3). However, it is important to note that the average household size (persons) was as follows: urban (3); farm (3.56); and rural non-farm (3.16). Farm households have a disposable income, which is greater than their total expenditure, while the urban and rural households have a disposable income, which is less than their total expenditure.

Table 3


<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Farm</th>
<th>Rural Non-Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Income</td>
<td>722</td>
<td>636</td>
<td>550</td>
</tr>
<tr>
<td>Disposable Income</td>
<td>586</td>
<td>569</td>
<td>471</td>
</tr>
<tr>
<td>Total Expenditure</td>
<td>613</td>
<td>536</td>
<td>510</td>
</tr>
<tr>
<td>Disposable Income per person</td>
<td>195</td>
<td>160</td>
<td>149</td>
</tr>
<tr>
<td>Disposable income per labour unit</td>
<td>451</td>
<td>337</td>
<td>374</td>
</tr>
</tbody>
</table>


Only 27% of farm respondents believed that the farm was capable of providing an adequate income for their future needs, while 57% believed it would not. Over half (54%) of farmers did not believe that the farm could fund future investment, 37% believed that it could. Half of rural respondents were concerned about the extent of their family living expenses (group with the lowest disposable income), compared to one third of urban dwellers and 40% of farm respondents (Pearson chi-square = 14.47, df = 8, p = 0.07). Farm women were more likely to be concerned (59%) than men (37%), which, reflects the fact that women have a greater knowledge about the cost of running a household. While rural respondents were more likely than urban residents to be concerned about their living expenses, they are also more likely to be concerned about their household income (32% versus 24%). One quarter of farm respondents were not at all concerned about their level of borrowings, while another quarter were a little concerned, with 27% stating that they were concerned or very concerned. Over half (53%) of rural dwellers were not at all concerned about their level of borrowings compared to 44% of urban dwellers (Pearson chi-square = 25.1, df = 8, p = 0.001).

Some 86% of farmers were living in a house owned by either themselves or their spouse, and 13% were living in a house owned by another family member. Four out of every five rural residents live in a house owned by themselves or their spouse compared to only 63% of urban dwellers (Pearson chi-square = 38.57, df = 4, p = 0.000). One quarter of the farm respondents lived in a house on which there was a mortgage being paid, compared to 39% of rural respondents and 58% of urban residents (Pearson chi-square = 23.44, df = 2, p = 0.000).

Almost half (48%) of farm households had an income from an off-farm job held by either the respondent or the spouse. Only 35% of the farm households were fully dependent on the farm income (remainder had income from job, other enterprises or welfare). The younger the operators and the smaller the farms, the more likely they were to have an off-farm income. The main disadvantages to holding an off-farm job were: being very busy; less time for family; and long hours. The main advantage was the extra income generated.
Social Interaction

Over half (52.3%) of farm respondents were active members (attend at least one meeting per year) of a farm organisation and one-third (32%) were active members of a sports organisation. However, one in five was not active members of any local organisations. Farm respondents were significantly more likely to be actively involved in local organisations than their urban and rural counterparts (Pearson chi-square = 22.23, df = 6, p = 0.001).

Women had more regular social activities than men (Pearson chi-square = 6.681, df = 2, p = 0.035). Farmers where either themselves or their spouse had an off-farm source of income were more likely to be involved in a greater number of social activities than those without an off-farm source of income (Pearson chi-square = 6.94, df = 2, p = 0.031). Visiting friends/relatives and having friends/relatives to visit were the most popular social activities for the vast majority of the respondents (rural and urban). A social drink was more popular for urban dwellers (85.7%) than rural dwellers (66.7%). Farm respondents had significantly less regular social activities than their rural and urban counterparts (Pearson chi-square = 21.32, df = 4, p = 0.000).

Some 65% of urban dwellers and 67% of rural dwellers had adequate time for relaxation/hobbies compared to 57% of farm respondents. Younger farmers were the least likely to consider that they had adequate time for relaxation. Two-thirds (65%) of farmers with no off-farm source of income had adequate time for relaxation compared to only 43% of those with an off-farm source of income (Pearson chi-square = 6.26, df = 1, p = 0.012). While over four out of every five urban and rural dwellers (84% and 82% respectively) had adequate time for family/friends, only 68% of farm respondents felt likewise (Pearson chi-square = 9.302, df = 2, p = 0.01). The older the respondent, the more likely they were to consider they had adequate time for family and friends. As farm size increased, farmers had less time to spend with their family and friends. Only half of those with an off-farm source of income stated that they had adequate time for family/friends compared to over three-quarters (77%) of those with no off-farm job (Pearson chi-square = 10.121, df = 1, p = 0.001).

Over one-third (38%) of farmers did not take an annual holiday. Over one-quarter (27%) took less than one weeks’ holiday and only one in ten (11%) took an annual holiday of more than 2 weeks. The larger the farm and the younger the operator, the more likely they were to take a holiday. Urban dwellers (83%) were significantly more likely to take an annual holiday than rural (70%) and farm residents (62%) (Pearson chi-square = 12.05, df = 2, p = 0.002).

Perceptions on Quality of Life

Place of residence had a significant influence on respondents’ perception on their life. Urban dwellers were significantly more likely to consider their life stressed than rural or farm dwellers (41% versus 28% and 32% respectively) (Pearson chi-square = 13.36, df = 4, p = 0.01). Farmers aged less than 35 years were twice as likely to consider their life stressful than those aged over 55 years (42% versus 21%) (Pearson chi-square = 16.66, df = 4, p = 0.002). Women were twice more likely than men to consider their life stressful (59% versus 28%) and men were almost three times more likely than women to consider their life relaxed (17% versus 6%) (Pearson chi-square = 6.84, df = 2, p = 0.033).

Perception on the quality of life was also influenced by place of residence. Rural dwellers were most likely to perceive their quality of life to be good (80%) compared to two-thirds of urban dwellers and 59% of farm respondents (Pearson chi-square = 11.51, df = 2, p = 0.003). Similarly, rural respondents were most likely to consider that their quality of life was the same or better to that of others of their own
generation and farm respondents were least likely to consider this to be the case (Pearson chi-square = 11.36, \( df = 4, p = 0.023 \)).

One third of farm families with an off-farm source of income considered that their quality of life was better than others compared to 28% of those with no off-farm source of income (Pearson chi-square = 6.18, \( df = 2, p = 0.046 \)). However, those with an off-farm source of income were more likely to consider that their quality of life was worse than others compared with those with no off-farm income (20% versus 9%). This could be explained that for some the presence of an off-farm source of income improves their quality of life but for others it make take from the quality of life due to the necessity of combining two jobs (longer hours and more pressure).

**Life Quality Index**

A life quality index (LQI) was constructed in order to derive a relative and comparative measure of quality of life (1=lowest quality of life, 5=highest quality of life). The index included variables relating to: social activities; involvement in organisations; attitudes towards incomes; expenses; borrowings; hours of work; life; and quality of life. Based on the life quality index, there was no significant difference in terms of quality of life between urban, rural and farm residents. Older respondents were significantly more likely to have a higher LQI than younger respondents (Pearson chi-square = 39.57, \( df = 16, p = 0.001 \)). Farm size had no influence on the LQI.

The presence of an off-farm job for either the operator or spouse had no significant influence on the LQI. However, the overall number of hours worked impacted on life quality, 28% of farmers who worked less than 60 hours per week had an LQI of less than 2 compared to 60% of farmers who worked more than 80 hours per week (Table 4).

### Table 4

<table>
<thead>
<tr>
<th>Life Quality Index</th>
<th>&lt; 60 (%)</th>
<th>60-80 (%)</th>
<th>&gt; 80 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.0</td>
<td>15.9</td>
<td>20.0</td>
</tr>
<tr>
<td>2</td>
<td>20.9</td>
<td>34.8</td>
<td>40.0</td>
</tr>
<tr>
<td>3</td>
<td>23.3</td>
<td>26.1</td>
<td>22.9</td>
</tr>
<tr>
<td>4</td>
<td>23.3</td>
<td>17.4</td>
<td>14.3</td>
</tr>
<tr>
<td>5</td>
<td>25.6</td>
<td>5.8</td>
<td>2.9</td>
</tr>
</tbody>
</table>

*Note.* Pearson Chi-Square = 18.35, Degrees of Freedom = 8, \( p = 0.019 \).

For the purposes of comparative analysis with farm families, only those (non-farm rural and urban) who stated their occupation as being employed/household were considered (excluding unemployed/retired/students/unable to work). The findings were similar to farm families, the more hours worked the lower the LQI (Table 5). Some 45% of respondents who worked less than 40 hours per week had an LQI of 4-5 compared to 17% of respondents who worked more than 60 hours per week.
Labour efficiency and time spent working influence the LQI of farm respondents. For those farm respondents who considered their systems too labour intensive/time consuming, 61% had a LQI of 2 or less compared to 32% of those who didn’t consider their system too time consuming (Pearson chi-square = 22.25, df = 4, p = 0.000). Almost 3 times more respondents with inadequate farm facilities had a LQI of one compared to those with adequate facilities (30% versus 11%) (Pearson chi-square = 7.44, df = 3, p = 0.059).

**Conclusions**

Farm women work more hours than men (more off-farm & in the household and less on-farm). Women in the urban households are more likely to work outside the home than other women. Farmers work much greater hours than their urban and rural counterparts. However, while urban dwellers work the least amount of hours, a factor not included was commuting time, which could considerably increase the amount of time that they spend in actually getting their work done. The difference in hours of work could also be accounted for by the fact that farmers work weekends while many other occupations don’t or else if they do, they have time off during the week instead. Part-time farmers work less hours on the farm but more hours overall than full-time farmers. It is obvious that for the majority of farm operators with an off-farm job (whether by choice or force), the decision was ultimately out of economic necessity because the negative consequences of having another job were being very busy, long hours and less time for family and dealing with farm problems, while the principle advantage was the extra income. Labour efficient practices may become more of a necessity in the future as more farm households are forced to seek off-farm sources of income, a prospect that is confirmed by respondents in the fact that only a minority believed that the farm could provide them with an adequate income for the future.

Farmers are still very much tied to their occupation, which was highlighted by the fact that half took only a weekend away from the farm or no holiday annually. Of course, the taking of a holiday is a personal choice for each individual but reasons such as the cost/difficulty of getting someone to take over the farm or the inability to afford the cost of the holiday/break itself may be factors, which are preventing the taking of holidays.

Members of farm households have a relatively high level of activity in local organisations (farming, sports and the church related are the most popular). The traditional rural links with family and community are also evident in the main social activities identified, visiting friends/family and having friends/family visit them. It highlights the high level of connection between rural people even in
modern society. Women had more social interaction than men and those with an off-farm source of income had more interaction than full-time farmers. This indicates a factor, which did not arise in the study but is nonetheless an issue in rural communities—isolaton and loneliness. Male full-time farmers are therefore more prone to be affected by isolation as they have less social interaction than other members of farm households.

The pressures of work both on and off farm are forcing many farmers into a situation that they have not enough time for relaxation and family/friends. This is an issue, which long-term could lead to much greater problems of stress and burnout. It highlights the need for farm operators to assess the labour efficiency of their farming operations but also the compatibility of working on and off farm—an evaluation of the overall use of their labour resource. While the taking of an off-farm job may make economic sense, it may have other more serious consequences.

Overall the farming population consider on average that farming is a relaxed or balanced career, however, support needs to be provided to those (almost one third) who find the career stressful. It is a concern that even though the younger farmers are the most positive about the future, they are also the most stressed. The fact that women are more stressed than men may relate to the fact that they are the ones running the household and dealing first hand with the income expenditure imbalance.

With regard to the attitudes of respondents to their financial situations, the only conclusion that can be drawn is that there are very varied financial situations ranging from those with no concerns to serious concerns which highlights the need for an advisory service which can cater for these diverse needs and an ability to focus on different aspects such as income, living expenses and borrowings. Also there is a need for advisory services to target the farm women as they have the greater concerns about the family finances as they are most likely to be dealing with the family finances. However, one of the major sources of financial pressure in modern society, a mortgage, is not a burden for the majority of farm households. This reflects the age profile where many of the farm households would never have had a mortgage, inherited the family home or else have an earlier mortgage repaid.

Overall farm families are satisfied that they have a good quality of life and how it compares with others.

**Implications for Extension**
A number of key implications for the Irish Extension Agency—Teagasc can be drawn from the research findings on quality of life. These implications are also relevant internationally.

Changes in farming are very often assessed in terms of their impact on income (traditional measure) and more recently on quality of life. One of the difficulties with assessing quality of life is that there is little previous research on the quality of life of farm families. Therefore, this research has provided a baseline for quality of life, which is important so that the progress or lack of it towards improving life quality can be monitored. The research provided in this paper serves as one example of measurement and furthers the knowledge and understanding of the issue.

Extension agencies working in traditionally technical services need to decide on the priority of quality of life within their organisations. There is a need to assess how important the issue of quality of life is to them and what individual advisers can do to address quality of life. In order to generate discussion on quality of life, extension agents need to have knowledge of quality of life, the influences on it and farmers’ views on the aspects, which influence quality of life. The need for an awareness of the factors which influence quality of life and the interplay between different factors is evident in the fact that
while the taking of an off-farm job can on the one hand improve quality of life by improving household income, it can also lead to increased stress and less time for family/friends and relaxation.

Extension agents need to encourage farm families to explore quality of life and to make practical changes to improve their quality of life. The challenge for advisers is to get farm families to identify their particular concern and to take positive action. Due to the fact that quality of life is rarely the priority issue about which they make contact with their adviser, extension agents need to place quality of life on the agenda of farm families.

There is a need to develop relevant practical extension and training materials for extension agents who are exploring the issue of quality of life with farm families. Many extension agents may consider that quality of life is not a priority issue for farmers and is not the area on which they want to engage with their adviser (primary contact is on technical issues) but in dealing with these issues, most farmers raise quality of life issues with their adviser (including issues such as: long hours; stress; combining the farm and job; cost of living; inheritance; and income uncertainty). These issues relate to quality of life and therefore extension agencies have more dealings with quality of life than anyone else. Extension agents are therefore in a position to positively influence the quality of life. The research on which this paper was based provides an insight into quality of life and provides key figures and questions, which can be used by extension agents in probing this issue.

Rivera (1991) concluded that public sector extension worldwide has been criticised for not doing enough, not doing it well and for not being relevant. In terms of quality of life, it is fair to conclude that extension is not doing enough to explore quality of life with farm families and encouraging them to address the issue. Part of the reason for not doing enough is possibly a fear that they (extension agents) will not be able to do it well; advisers/extension agents are more comfortable in dealing with technical issues. Due to the fact that quality of life issues are very often not the main reason why farm families contact extension agents/advisers, there may be a fear among extension agents that quality of life issues may not be relevant for those families. The evidence from Ireland is that much more needs to be done on quality of life, extension agents are in a position to support farm families to address these issues and they are very relevant to farm families. Extension must adjust their services and extension agents themselves must change to respond to these needs.

References


Abstract

There has been increasing interest in international agriculture and courses to teach it. At the same time, instruction on international agriculture topics varies a great deal from one college of agriculture to another. The primary purpose of the paper is to describe the innovative process used at Virginia Tech to develop a new graduate level course on international agriculture with the title “Developing Agricultural and Extension Programs in Sustainable Food Systems.” A secondary purpose is to share a successful course development procedure with other universities that might like to emulate it.

A multi-step process was utilized to develop the new international agriculture course. The process proved successful and created an innovative and useful course first taught in the spring semester of 2004 and has currently been approved as a permanent course.

Keywords: International Agriculture, Globalization, Distance Delivery, Course Development
Background

Instruction in international agriculture has varied dramatically from one college of agriculture to another, as well as among departments in colleges of agriculture. At the same time, it is evident that the need for such instruction is great at many educational levels. For example, Bell and Christiansen (2000) identified restraints facing the improvement and implementation of international instruction in secondary agriculture.

More recently, Connors (2003) reported studying FFA members who had participated in the Costa Rica Travel Seminar had positive attitudes towards international travel and learning about international agriculture. However, they had received little instruction as part of their secondary agriculture program. Connors recommended that:

- Efforts should be made to increase the amount of international agriculture topics covered in secondary and postsecondary agriculture programs.
- Students participating in international agriculture study tours should receive instruction on the society, culture, and agriculture of the country being visited before the tour begins. Additional instructional time should be included during the tour and debriefing offered at the conclusion. (p. 70)

Radhakrishna, Leite, and Domer (2003) studied the attitudes of students who participated in the Pennsylvania Governor’s School for Agricultural Sciences and determined that “efforts should be continued to infuse international agricultural concepts into the curricula in our schools, colleges, and universities” (p. 86). Specific topics recommended for study were:

- “...understanding of the major regions in the world, major regions in the United States, interdependency of nations, and how were the United States’ relationships with other countries relative to political, economic, and humanitarian issues” (p. 86).

In a study reported in 2000, Knight, Elliott, and Krenzer found a great deal of interest on the part of Arizona Extension personnel for work in the international arena. They noted that:

- About half of the Extension personnel have included an international dimension into their Extension efforts.
- However, ninety-two percent of the participants indicated an interest in for including international efforts into future Extension programs. Sixty-five percent of the participants expressed an interest in an out-of-country assignment. (p. 9)

Ludwig & McGirr (2003) reported that Cooperative Extension has established a national initiative to strengthen its international dimension. The same authors stated:

- This system consists of a partnership between the U. S. Department of Agriculture’s Cooperative, State Research, Education and Extension Service (CSREES); state extension services at land-grant colleges and universities in every state and territory; and local extension offices in more than 3,000 counties. In today’s era of heightened globalization, this system is increasingly viewed as a tremendous resource in helping citizens understand better the implications of a globally independent world. (p. 80)

Not only is there a need for additional instruction on international agriculture, but there is also an issue on how to best deliver such instruction. This issue is especially important while working with a far-flung clientele that cannot always take courses on campus. Flood and Conklin (2003) noted that “Teaching faculty is expected to use technologies with only rudimentary support, no incentives, and an inadequate awareness of how to incorporate technologies into instructional settings” (p. 75). The same researchers conducted a study which determined that more than 75% of the
faculty at The Ohio State College of Food, Agricultural, and Environmental Sciences reported having essentially no support for technology-based teaching. An important issue for developing a distance-delivered international agriculture course is how to do so with minimal or no financial resources.

The current course being developed was the first-ever international course to be offered in a newly formed department. While there was a degree of expertise within the department on international agriculture and education, it was deemed best to thoroughly develop a course that was to be taught at the graduate level and to be delivered in a distance format.

The course would be required to meet the educational needs of a clientele primarily composed of Extension agents and agricultural education teachers. It would need to become part of a master’s degree program that could be entirely delivered via a distance-delivery mode. The course would need to be utilized by prospective students in numerous states, settings, and universities. In general, it had to go beyond any parochial thinking.

Of necessity, the course needed to be developed by educators with a broad background in international agriculture and education. There was a need for an innovative approach to the development of this new course and to use the assistance of numerous experts in the field.

Course Development Process

The following multi-step process was utilized to develop the international agriculture course. All off-campus correspondence was conducted using either the telephone or computer technology. All data and information were collected from November 2002 through February 2003. The multi-step process included:

1. An initial conversation among the two faculty members and an administrator with extensive international experience was held to develop a strategy for course development.
2. A five-member core for a task force was created. The core was composed of faculty members from other institutions who had expertise in international agriculture and were known and respected by the two departmental faculty members.
3. Each of the five core members were asked to name two additional members with international experience known and respected by them to serve on the task force. The additional 10 members gave a total of 15 for the task force. Members of the task force were located both domestically and internationally.
4. Each of the 15 members on the task force was asked to write a suggested purpose statement for the course.
5. The two departmental educators chose the best combination of words and statements from among the ones suggested and established one best statement of purpose.
6. The established purpose statement was shared with task force members who were asked to suggest specific topics for the course.
7. After establishing 78 non-duplicated possible topics for the course, the task force members were asked to rate each topic on a scale of 1 (definitely do not use) to 5 (definitely use).
8. Statistical means were determined and used to rank order each topic.
9. Broad course topics were determined by examination of specific topical means that were used either intact or by combining topics to make broader ones.
Educational Importance, Implications, and Applications

With a greater demand for instruction in international agriculture, it is more important than ever before to provide a course on the topic for interested clientele. With budgetary and time constraints, it is equally important to find an efficient manner in which to design such a course.

The system utilized in this study was very successful. Using technology to develop the course description and prioritize the content was very appropriate for establishing a distance-delivered course on international agriculture. It permitted the rapid turnaround time of experts on the subject from both a national and international pool of participants. It is also a system that is transportable and can be utilized by any college or agriculture department that wants to establish a similar course.

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