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

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

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

Feature Articles

Feature articles focus on philosophy, current or emerging issues, and the methodology and practical application of specific research and appropriate technologies, which have implications for developed and developing countries.

Feature articles go through the Journal's blind review process utilizing peer reviewers to evaluate content and readability. Reviewers are usually selected from the membership of the AIAEE. In the blind review process all reference to author(s) is removed before the manuscript is sent to reviewers.

Commentary Articles

Commentary articles state an opinion, offer a challenge, or present a thought-provoking idea on an issue of concern to international agricultural and extension education, including a published article in the Journal.

Commentary articles are reviewed by two members of the editorial board for appropriateness and relevance to the Journal, and for readability.

Tools of the Profession Articles

Tools of the Profession articles report on specific techniques, materials, books and technologies that can be useful to agricultural and extension educators in a global context and/or in a country/region.

Tools of the Profession articles are reviewed by two members of the editorial board for appropriateness and relevance to the Journal, and for readability.
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From the Editor

I begin my tenure as journal editor with a word of thanks to Jack Elliot who did an outstanding job of conceptualizing and publishing the journal for four years. For his service to the journal and the association Jack was deservedly recognized at this year’s annual conference with the outstanding young professional award. Congratulations, Jack, and thanks!

As I assume the mantle of responsibility of the journal, I feel it is important to tell our readers where we hope the journal is headed and invite their opinions and comments for publication in an appropriate forum in the journal.

When the idea of the journal was presented to the AIAEE Board in 1991, the vision was for it to be a premier international journal contributing to the advancement of the agricultural and extension education profession and country development on a worldwide basis through the sharing of science-based and experiential knowledge. I think we have made good progress and are taking steps, albeit small, to realize this vision.

The idea of an enlarged editorial board for the journal to provide regional representation on a worldwide geographic basis has been initiated. Regional participation should promote ownership, liaison and marketing of the journal, increase and diversify the flow of articles from those regions, and add to the wealth of shared ideas. Universities, libraries, and non-government organizations in different countries offer a potential source of ideas and knowledge for the journal, and a valuable pool of readership to increase our circulation and reach.

A new 12-member editorial board will guide the Journal for the next few years. Individuals on the five-person board which served the journal since its inception deserve our thanks for an excellent start.

A significant change in the scope of the journal beginning with this issue is the opening up of two new sections, Commentary, and Tools of the Profession. These sections will be in addition to the regular research-based and issue-oriented feature articles that the journal has carried since its inception. Submissions of manuscripts to the new sections will be subject to editorial board review, and not the usual blind review process for feature articles. Further information about these sections and submission guidelines are included in this issue.

This change in the scope of the journal was agreed to by a majority of the journal's readership who attended the Twelfth Annual Conference in Arlington, Virginia, March 28-30. This came out in the results of a reader survey which was done at the conference. Other changes in scope favored by readers were new sections on New Ideas, Practical Applications of Research/Technology, and Appropriate Technology. Readers commented on a few things about the journal. Most of them (a) read the journal and used it in their teaching and/or writing, (b) liked the size, length, appearance and format, and (c) did not feel that the journal's payment schedule was discouraging authors from submitting articles. Choice praise for the journal included "well put together"; "a hidden treasure". Readers' concerns for better marketing of the journal and on-time publication are issues the editorial board will vigorously pursue.
I would like to close by indicating a few ideas the editorial board is considering to improve the journal in the future:

Spanish and/or French translations of appropriate articles in selected journal issues to target Central/South America and Africa, respectively.

Closely related to the above is the idea of journal issues with a regional focus.

Establishing relationships with journals in agricultural education and extension education disciplines published in other countries/regions. Such an arrangement has already been made with the European Journal of Agricultural Education and Extension (EJAEE), published quarterly by the University of Wageningen, The Netherlands. Contacts have also been initiated with the South African Journal of Agricultural Extension and Indian Journal of Extension Education.

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PROBLEMS AND PROSPECTS
FOR INTERNATIONALIZING THE LAND GRANT UNIVERSITY

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Abstract

Some faculty in colleges of agriculture at land grant universities wish their institutions had more emphasis on international programming. Penn State University decided to conduct an internal study of the current resources, opportunities, barriers, and desired actions to internationalize the university. Faculty, staff, and students were involved in committees to identify the resources, opportunities, and barriers, and then recommend specific activities for strengthening international programs at Penn State. After eight months of discussion, data gathering, and analysis, 33 recommendations were made. A vision statement was drafted to guide the implementation of these recommendations. The recommendations generated by this study may be useful for other colleges and universities who wish to strengthen international programming in an increasingly interdependent global community.

Anyone who has represented a land grant university as an educational consultant abroad recognizes that this role has advantages and disadvantages. In spite of the resources, the support of colleagues, and the institutional base of a mutually supporting system of three parts--extension, resident education, and research--most land grant universities also present problems. They are large, bureaucratic institutions which respond slowly to the needs of individual employees; administrators often support international commitments in word but not in deed; promotion and tenure pressures seem to trouble consultants working abroad; and the vast resources which the consultant needs from the home university are often poorly organized, inaccessible, or difficult to mobilize.

These disadvantages decrease the effectiveness of the land grant university as a partner in international development. They hamper relationships between the university and institutions abroad, between the university and governmental agencies both abroad and in the United States, and between the university and non-governmental organizations. They also hamper the effectiveness of individual consultants who are working abroad.

The Pennsylvania State University, commonly referred to as Penn State, initiated an institution-wide effort to address these problems during the 1993-94 academic year by conducting an internal study of its international function. At the beginning of this effort the concept of "internationalizing a university" was not well understood. Deutsch (1970) has described three strategic options which can be viewed as aspects of internationalization: (a) increase the number of U.S. students studying abroad, (b) provide more opportunities for foreign students to study in the U.S., and (c) focus on curricula by offering more courses on international topics and adding international content to current...
curricula. Penn State adopted these three strategies in its definition of "internationalizing the university" but it also included three other approaches: (a) provide opportunities for faculty members to gain international experience through teaching, research, and service, (b) reward faculty for international work, especially by changing criteria for promotion and tenure, and (c) expand the number of international activities and opportunities on campus to benefit all members of the university community.

Penn State's Internal Study: Purpose, Objectives and Procedure

The purpose of Penn State's internal study was to find ways to strengthen the international dimension of teaching, research, and extension at the university. Specific objectives were to (a) assess current resources, (b) determine opportunities, (c) identify barriers, and (d) recommend specific actions to more fully internationalize the university.

The central administration of Penn State directed the Associate Vice President for International Programs to organize a faculty task force representing diverse groups to study the current situation and recommend future actions. The Associate Vice President asked his advisory committee, the International Council, which is comprised of administrators and other faculty with recognized interests in the international mission of the university, to appoint five sub-committees to study (a) internationalizing the curriculum, (b) internationalizing the campus climate for faculty, staff, and students, (c) providing international experiences to undergraduate students, (d) increasing international activities for graduate students and faculty, and (e) recognizing international experience of faculty. These sub-committees were each chaired by a member of the International Council and were comprised of faculty, staff, and students from all colleges of the university.

The sub-committees met throughout the academic year for a total of eight months to complete the objectives. Following the sequence implied in the objectives, they (a) identified current programs and resources at the university, (b) reviewed strategic plans, proposals, and suggestions that had been made by members of the campus community related to improving international resources and efforts, and identified colleges and universities which were known for exemplary efforts to internationalize their respective institutions and collected information and ideas from those institutions, (c) listed barriers to internationalizing the university, and (d) made recommendations for specific actions to more fully internationalize the university.

The sub-committees were not asked to review literature on the need for internationalizing Penn State. But they used several supporting studies (Carlson & Widaman 1988; Council on International Educational Exchange 1988; Hembroff, Knott & Keefe 1990; Lambert 1989; Sell & Craig 1983). These studies supported efforts to internationalize university curricula, described benefits to students and institutions, and documented progress in efforts to internationalize universities during the 1970s and 1980s. They also noted the increasingly complex, shifting global environment which necessitates strategies to continue a flexible process of internationalization of American universities.

Each sub-committee submitted a written report in March 1994 to the International Council. These reports were merged into a single document, entitled "University-Wide Strategic Plan for International Education at The Pennsylvania State University," which was published by the International Council in April 1994. Hereafter, this document will be called "Strategic Plan" when referring to information drawn from it. Information which is not referenced from the Strategic Plan comes from the author's experience while serving on the sub-committee for internationalizing the curriculum and while serving as coordinator of the Minor in International Agriculture.
Study Findings

Penn State's International Resources

Penn State, like all land grant universities, has many international resources. The student body is composed of representatives of most countries of the world. The faculty have contributed to various major institutional projects and have engaged in individual study and consulting which have built international expertise. In 1994 Penn State and the University of Indiana were tied for the largest number of faculty, 14, selected for Fulbright Fellowships abroad for the 1994-95 academic year (Centre Daily Times, 1994). The University Office of International Programs has been recognized repeatedly for the breadth and quality of its programs. It maintains faculty resource inventories which list faculty by language competence and by work experience in other countries.

All 12 colleges of the university and most departments offer courses and academic programs which include an international emphasis. An informal count recently identified 655 courses with significant international content, meaning that at least 20% of the course content and class time was devoted to issues and skills which would make students more sensitive to diversity. Majors and minors are available in language studies, area studies, and international studies. An example is the minor in international agriculture which is administered by the Department of Agricultural and Extension Education. Any Penn State student can complete this minor with 18 credits approved by the coordinator of the minor. About half of the 35 current minors are in the College of Agricultural Sciences. The other half come from five other colleges. Students are required to complete two three-credit hour courses, Introduction to International Agriculture, and Problem Solving in Tropical Agriculture. The latter course includes an 11-day field trip to Puerto Rico for a problem-solving exercise.

Many other programs offer direct international experience. Over 600 Penn State undergraduates (6-7 percent of the total undergraduate enrollment) participated in 67 education abroad programs in 27 different countries in 1994. Forty-six of these programs were administered by Penn State and 21 were through the Council on International Education Exchange (Strategic Plan, p. 17).

Opportunities for Strengthening International Programs

Each sub-committee identified universities with exemplary international programs in order to suggest opportunities for improvements in internationalizing Penn State's offerings. Highlights of their findings are included in this section.

Due to the emphasis on international study of many liberal arts colleges in the United States and because they are smaller in size, as many as half of their students have participated in education abroad programs by the time they graduate. These colleges (a) provided several clearly focused options for study abroad, (b) publicized these options to potential students, (c) prevented unnecessary problems in logistics and the administration of the programs, and (d) assured that funds were sufficient to assist students who could not afford the costs.

One sub-committee studied ways and means by which 21 exemplary universities are internationalizing curricula. It found that 13 institutions have a central office for international education which coordinates and facilitates the development of an internationalized curriculum. Fourteen institutions offer an undergraduate major in international studies with required proficiency in a foreign language. Four universities require an education abroad experience for graduation. Nine universities offer international minors, four offer an option in international studies, and five have a certificate program in international studies (Strategic Plan, p. 19).

A 1990 survey of 183 universities disclosed that those institutions that recognize and reward the
faculty's work in international education have achieved a greater degree of internationalization than those that give little or no recognition and rewards for these initiatives. The survey further indicated that faculty tend to focus their research on projects to be pursued in the United States unless strong encouragement, recognition, and rewards are provided at each level of the university (Washington State University, 1990).

Apart from other exemplary universities in the United States, one of the sub-committees noted the ERASMUS program (European Regional Action Scheme for the Mobility of University Students). This program has had some success in implementing exchanges of students at universities in the European Community (Strategic Plan, p. 17).

**Barriers**

An important barrier to internationalizing Penn State is institutional complexity -- many departments within the 12 colleges. This institutional complexity hampers communication and decision making. Administrative and academic turf delays or prevents solutions to problems which cut across real or perceived boundaries.

Funding is another obvious barrier. One concrete example at Penn State is the lack of funding to hire new faculty needed to increase the number of sections in the first two years of language instruction (Strategic Plan, p. 20).

Developing linkages with institutions in other countries takes time, patience, language skills, and competence in cross-cultural communication. These same requirements are necessary to maintain institutional linkages. When linkages become too unbalanced they tend to end. Exchange programs, for example, become unequal when one institution sends more students than it receives (Strategic Plan, p. 23).

Lack of vision can also be a barrier. This problem may arise from ethnocentrism, lack of international experience, or other demands of time and attention which divert individuals from considering international opportunities.

Administration of international programs can be a barrier. If individuals (including students, staff, faculty, and administrators) perceive that participating in a particular program may be an unnecessary waste of their time, they are not likely to participate. If students learn from other students about problems in planning travel to education abroad sites or about problems in getting foreign courses accepted by Penn State, they may be deterred from applying for education abroad programs.

**Recommendations for Strengthening Penn State's International Programs**

Recommendations emerging from each sub-committee's work took the form of specific actions to strengthen the university's international programs. Actions recommended are listed by the sub-committee which proposed them.

**Internationalizing the curriculum.**

1. Require strategic plans of each academic unit to include provisions for internationalizing its part of the curriculum.

2. Raise the requirements for foreign language competence and provide options for students and faculty to gain and demonstrate language competence.

3. Design international curricula using an issue-oriented approach rather than the traditional single-discipline method. Issues might include energy, war and peace, pollution, food, and population.

4. Create an "international programs advisory committee" for each college, branch campus and the Division of Continuing and Distance Education.

5. Designate a curriculum development coordinator to assist faculty and students in developing mini-grants to strengthen the international component of their teaching, research, extension, or study.
Internationalizing the campus climate for faculty, staff and students.

1. Develop a marketing communications plan that will cultivate an awareness among students, parents, faculty, and administration that global understanding is a critical element of the university.

2. Provide in-service education for advisors on counseling domestic students on the international resources of the university and assisting international students with their unique academic and social needs integrating into the academic life of the university, while taking advantage of their cross-cultural perspective.

3. Provide financial support for academic units and student organizations to plan and conduct symposia, colloquia, speakers, programs, and cultural activities focusing on particular cultures or international issues.

4. Organize a university assembly for a "global briefing" on current and future issues, events, conflicts, and "areas to watch."

5. Increase U.S. students' participation in international clubs on campus.

6. Strengthen the university's emphasis on cultural diversity by providing workshops on racial discrimination for faculty as well as students.

7. Educate international students and faculty to make full use of existing channels for conflict resolution.

8. Compile and distribute widely a resource inventory of students from other countries who are available as resources for academic studies and extracurricular activities.

9. Review the university's policies concerning insurance for international students to make certain that enrollment barriers are not excessive.

10. Enhance mentoring programs for new international faculty including visiting scholars.

11. Insure that central administration reminds academic administrators periodically of the importance of Penn State's international priorities and commitments.

Providing international experiences to undergraduates.

1. Create an international studies minor which is administered by an intercollegiate committee through a network of advisors in all academic units.

2. Hire more faculty with international experience in teaching, research, and service.

3. Provide information on education abroad opportunities during orientation for new students and faculty.

4. Expand the number of education abroad sites (cooperating universities) from 21 to 50 and give 20% of each undergraduate class direct experience on one of those sites making certain that the experiences are affordable and will not delay students' graduation.

5. Facilitate the transfer of credits more easily from institutions in other countries.

6. Take more advantage of international study and travel opportunities afforded through other Big Ten universities and consortia of which Penn State is a member.

Increasing international opportunities for graduate students and faculty.

1. Develop a program through the central library for acquisition of international curricular materials, and training in their use across the university.

2. Increase awareness and opportunities for study, exchange of scholars, and collaborative research with universities abroad and with neighboring universities which have unique educational programs or resources.

3. Organize field trips for faculty to international sites so they may develop a greater international perspective, with special attention given to faculty who have not had an international experience.

4. Include Cooperative Extension agents in international trips as resources and consultants.

5. Educate students and faculty about the availability and uses of foreign television broadcasts shown on campus.

6. Expand the number of personnel in the College Deans' offices who are responsible for coordinating international programs for the colleges.

7. Organize task forces to apply for major grants which will allow for interdisciplinary experimentation in various alternatives for
international study, including internships, block semesters for motivated students and faculty, and job placement.

8. Appoint a task force to continue exploration of continuing barriers and emerging opportunities for international studies, research, and extension work.

Recognizing international experience of faculty.

1. Provide cash prizes for outstanding teaching, research and extension programs that focus on an international dimension.
2. Revise promotion and tenure guidelines to more clearly recognize work done on campus with an international focus as well as work done outside the country.
3. Establish a university award for the International Educator of the Year to recognize faculty accomplishments in this area.

These recommendations (Strategic Plan, pp. 35-103) were not prioritized. Since the committee which generated the recommendations had no authority for their implementation, and since implementation was anticipated by a wide variety of administrative units, priorities were left to the administrative units.

A Vision for International Education

As a result of this comprehensive effort to develop new initiatives to internationalize Penn State, a vision statement for international education was developed. In part, this vision comes from the deliberations which initiated the institution-wide study. In part, this vision comes from the work of the five sub-committees. The statement reads:

The Pennsylvania State University envisions university-wide, integrated programs with a strong international dimension as a central part of its commitment to cultural diversity. These programs will enable present and future members of the university community to benefit from multicultural emphases and from comparative perspectives and to initiate positive changes in their fields. This reciprocal vision is consonant with each of the university's overarching goals and will hasten its advancement as a world-class teaching and research university. By employing the Strategic Plan for International Education as a blueprint, Penn State can assume national and international leadership in educating all persons on its campuses to understand traditional political alignments and cultural values and to respond effectively to the continuous changes that characterize an interdependent world community (Strategic Plan, p. 7).

Notable in this vision statement, which mentions teaching and research, is the absence of any reference to extension programs. University outreach programs, including Cooperative Extension, are still not always recognized on the same level as the teaching and research missions of the land grant university. A vision of Penn State as a world-class university is incomplete without a full understanding of Penn State's mission as a land grant university.

Actions Taken to Further Internationalize Penn State

Since the initiation of this study, a number of steps described below have been taken to internationalize Penn State. Some steps were already under consideration before the study began. Some resulted from sub-committee deliberations prior to the publication of the report. Some have resulted from the Strategic Plan.

1. The Office of International Programs has requested that central administration establish an endowment of $22.76 million. This endowment would be divided in the following way:

   Scholarships of grant-in-aid to realize the goal of 20% undergraduate participation in education abroad programs ($600,000 annual interest from a $12 million endowment); funds that will increase support for the research of faculty and
graduate students in other countries ($50,000 annual interest from a $1 million endowment); development of international exchanges ($210,000 annual interest from a $4.20 million endowment); and tuition grants and scholarships for international students ($275,000 annual interest from a $5.5 million endowment) (Strategic Plan, pp. 5-6).

2. The University Faculty Senate approved a semester of education abroad as an option for fulfilling Penn State's cultural diversity requirement for all undergraduates. The Senate also added "international programs" and service "abroad" to the promotion and tenure criteria for teaching and for service activities.

3. The University Future Committee, an institution-wide group charged with cutting unnecessary programs, eliminating overlap, and focusing existing programs for greater efficiency, endorsed the goal of providing an international experience for 20% of each undergraduate graduating class.

4. The College of Business Administration has made a semester of education abroad a requirement for a degree in international business and is incorporating an international experience into its MBA program. The College of Liberal Arts has approved a new minor in international studies which is open to students from all majors.

5. The International Council has established awards for internationalizing the university. Criteria were established and a procedure for the selection of candidates was announced. The first awards were made on February 17, 1995, at a university awards ceremony led by the Provost. Five undergraduates, five graduate students, and ten faculty members were designated as finalists and recognized for their contributions to the international efforts of Penn State. Two of the faculty finalists were from the College of Agriculture. The outstanding undergraduate student had a minor in International Agriculture.

6. A sub-committee was organized to prepare a proposal for funding under the Boren Bill for funding meritorious programs to provide language instruction and area studies enacted by the U.S. Congress. The committee met throughout the 1993-94 academic year until a proposal was ready for submission.

7. Each department at Penn State has been directed to "benchmark" its efforts to internationalize its programs based on different institutions identified by the department as "best-in-class." The University Office of International Programs has identified five institutions, University of California at Berkeley, Michigan State, and the universities of Indiana, Minnesota, and Wisconsin for comparison. This office has also determined six criteria for benchmarking.

(1) The average grade point average of participants at the time of their selection for enrollment in an education abroad program.
(2) The average grade point average of participants during their period of study abroad.
(3) The academic and/or professional credentials of the staff teaching the courses abroad.
(4) The extent to which the programs provide for participant immersion in the foreign culture.
(5) The degree that improvement in students' appreciation for cultural diversity is enhanced by participation in the institution's education abroad programs.
(6) The degree of improvement in students' language skills relative to those who do not study abroad (Strategic Plan, pp. 24-25).

8. A University Advisory Committee on Internationalizing the Curriculum was appointed by the International Council to recommend ways to implement the University-Wide Strategic Plan for International Education. Its first report after a year of deliberations was submitted on May 12, 1995. It included (a) suggestions for increasing language competence of students and
faculty, (b) a recommendation to couple foreign language majors with discipline-based minors or majors, (c) a suggestion that college deans promote international studies and foreign language courses and that they consider making foreign language a requirement for graduation, (d) specific ideas for adding an international dimension to current courses, (e) a request for mini grants for international course development, (f) a recommendation for freshmen seminars centering on international topics, and (g) ideas to provide annual competitive fellowships to aid undergraduate students who wish to participate in the education abroad program (Salper, 1995).

Other steps necessary for implementing the sub-committees' recommendations are also under way. These include (a) enlisting Penn State alumni from geographically underrepresented areas to assist in recruitment, (b) increasing housing on campus for married international students, (c) enhancing English language support services including additional instructors and staff, (d) increasing financial aid for tuition grants, and scholarship funds, and (e) increasing sustained interaction between international students and their U.S. counterparts (Strategic Plan, pp. 115-116).

Conclusions

Actions recommended for internationalizing Penn State are relevant for all land-grant universities as well as other colleges in the United States and abroad. The choice of priorities and the manner of implementation of the recommendations will vary among institutions. The list of recommendations, however, provides a checklist of actions to consider and can also serve as an evaluation tool for other universities to assess their current state as an "internationalized university." Penn State's experience can thus save other institutions valuable time needed to generate a completely new set of recommendations.

The Association for International Agricultural and Extension Education (AIAEE) would be an appropriate forum for the discussion of the various recommendations. Information on similar efforts to internationalize other universities is not generally available. AIAEE could help individuals from these universities to identify specific implementation steps and to share successes and failures in their implementation.

The steps outlined in this paper are needed to address many of the shortcomings of U.S. higher education identified by Simon (1980). These include the distressing statistics that (a) 40% of American scholars cannot conduct research abroad in the language of their host country, (b) only five percent of our college graduates reach a meaningful proficiency in a second language, despite the fact that many come from bilingual homes, (c) the United States continues to be one of the few nations in the world that permits its students to graduate from both high school and college without having studied a foreign language, (d) the United States is the only major power with no language requirements for those entering its foreign services, and (e) no more than five percent of school teachers in the United States have taken a course with significant international content or have had professional contact with another culture for the equivalent of an academic semester. These shortcomings are corroborated by the author's personal experience in that the land grant university has been labeled a "weak partner" for international development projects over the past two decades by U.S. government agencies.

The case for internationalizing education is aptly advocated by Tannaz Rahman and W. LaMarr Kopp (1992) in the following description of world interdependence:

We are more aware today than ever before that we live in a global community, in an interdependent world. Forces that directly affect our lives and determine our decisions are shaped by persons and events far away from us in places we have never seen or visited, places that just a short while ago seemed as distant and remote as Timbuktu.
Yet we have come to realize that the problems we face, the challenges we meet, the solutions we seek, cannot be determined by us and by our nation acting unilaterally. The gravest issues we face are essentially all international issues requiring, demanding, global cooperation, centrally-focused initiatives, and a worldwide commitment.

References


AFRICAN FLAGSHIP UNIVERSITIES:
AN INSTITUTIONAL POLICY STUDY OF SOCIAL, AGRICULTURAL, AND ENVIRONMENTAL
SCIENCE PROGRAMS AT THE POSTGRADUATE LEVEL

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Outstanding Research Presentation

This paper is one of four outstanding research papers from the Eleventh Annual Meeting of the
Association for International Agricultural and Extension Education, Little Rock, AR, U.S.A., March 23-

Abstract

Although numerous studies have been completed over the past decade concerning the problems
associated with higher education in Africa, no study has examined the relative excellence of
many academic programs offered in Africa. The intent of this study was to identify top
postgraduate programs in social, agricultural, and environmental science.

Leading scholars, also identified as renowned authorities pertaining to African higher education
programs, were asked to rank the top three African academic programs in their field. Building
from this initial ranking, the second step of the study included on-site institutional evaluations.

As a result, the study provides an important contribution not only to the literature on higher
education, but also to the practice of long-term institution building. Policy approaches to
institutional development that would assist in the development of flagship African postgraduate
programs, keeping strong programs strong are suggested.

Purpose

The purpose of the study was to identify top
African postgraduate programs in agricultural, environmental, and rural social science
disciplines. The challenge of selecting top
postgraduate programs from 118 African
universities with academic programs numbering
well into the thousands was daunting. While the
literature on African higher education is flush
with research on problems such as attrition and
stabilization, there is a vacuum concerning any
research that examines the excellence that exists
in many African universities.

The act of identifying top African postgraduate
programs, at first glance, is comparable to
finding the proverbial needle in a haystack due
to the deficiency of research on the topic. Much
of the research that ranks different academic
programs is suspect for a variety of reasons,
such as alumni bias and criteria used. In reality,
it is probably irrelevant whether a program is
considered number one or number two if both

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programs are deemed excellent. It is for this reason that the study did not concern itself with a final ranking of academic programs. The overarching objective was to identify first-rate academic programs in stable institutional environments. This objective was achieved through a survey of international scholars who were asked to identify top programs in their field of study, followed by an evaluation of the university and program through on-site visits.

Methods

The research was accomplished through a pan-African study that identified universities in 12 African countries. Visitations to 18 of the universities generated specific institutional profiles. These profiles were used to conduct a comparative analysis of the top programs in each discipline.

Surveying an International Community of Scholars

The study identified scholars who were (a) leading disciplinary experts, and (b) renowned authorities pertaining to the quality of African postgraduate programs in their field of study. Each international scholar was contacted by fax and asked to rank the top three African academic programs in their field of study as well as to identify a specific contact person within the program. In addition, scholars were asked to identify other colleagues who would be knowledgeable of top African academic programs.

A survey of 71 international scholars from 11 disciplines was conducted to identify top academic programs from over 118 universities in Africa. Scholars surveyed had to meet two fundamental qualifications to qualify as part of the survey respondents. First, they had to be widely regarded as a leader in their field of study. Second, the scholar had to be an "Africanist" who was familiar with African postgraduate programs in their field.

The intent of the survey was not to conduct an ordinal ranking in order to determine the top program in a field of study. Clearly, no individual scholar, in any field of study, could conceivably give an objective pan-African ranking of all academic programs in their field. Often a scholar was familiar with programs in one region of Africa, but would know little of another region. One problem especially apparent was a lack of familiarity of many scholars with South African universities. As a result of these limitations, the survey results were simply used to provide a proxy or a guide to some excellent programs for further examination.

Rather than randomly selecting the scholars, who may or may not have the needed expertise, scholars in different professional associations were asked who they would recommend. As recommendations converged, scholars were sent surveys between June of 1994 and January of 1995 asking them to rank the top three postgraduate programs in their field of study.

Top programs were cited in specified disciplines from the following universities. The five top East African universities were the University of Nairobi, Egerton University in Kenya, Sokoine University of Agriculture, the University of Dar Es Salaam in Tanzania, and Makerere University in Uganda. In the South, top postgraduate programs were identified at the University of Pretoria, University of Cape Town, University of Witwatersrand, University of Natal, University of Stellenbosch, University of Fort Hare, University of Zimbabwe, University of Swaziland, and University of Botswana. In West Africa, programs at four universities were identified at Université Nationale de Côte d'Ivoire, University of Science and Technology in Ghana, the University of Ibadan in Nigeria, and Amadu Bello University in Nigeria. Three North African universities cited as having excellent postgraduate programs in given fields of study were included, Hassan II IAV in Morocco, and Alexandria University and Ain Shams University in Egypt.

Universities with the greatest number of top
programs included Pretoria and Zimbabwe with six excellent postgraduate programs in given fields of study. These universities were followed by Nairobi (5), Sokoine (4), Natal (4), Amadu Bello (4), Egerton (3), Makerere (3), Botswana (3), Ibadan (3), and Hassan II (3). The remaining universities were nominated for one outstanding program. Due to the applied nature of the disciplines considered, outstanding universities such as the University of Cape Town did not receive many nominations. In reality, Cape Town has more than twice as many world-class scientists than any other South African university. In fact, Cape Town has 15 A-rated scientists, Witwatersrand 7, Natal 6, Stellenbosch 2, and Pretoria only 1 degree (WA Reporter, 1994). Yet, when one examines the disciplines of the A-rated scientists, these professors are generally not in subjects considered to be foremost to rural development issues (zoology, mathematics, physics, engineering, microbiology, and astronomy to name a few). As a result, the number of top postgraduate programs cited should not be considered as a reflection of institutional strength. Rather, the nominations are merely a reflection or proxy of where some excellent applied postgraduate programs can be found in given disciplines.

Each of the rankings from the international scholars were tabulated as a "first-cut." These rankings were not intended to be conclusive at this point in the study. The ranking provided recommendations concerning the postgraduate programs which might be considered. The next step of the study was to actually visit each institution.

On-site Evaluations of the Universities and Programs

As previously indicated, the selection criteria for African universities included a high-quality postgraduate program, a nurturing environment for fellows, and a stable institutional environment. Although the former criteria provided the foundation for selection of university programs, many other considerations provided the larger decision-making structure for selecting an academic program. These considerations included issues such as the availability of books, volumes in the library, journals available, accessibility to computer resources, condition of laboratories, percentages of men versus women among professors and students, graduate students per professor, and percentage of students who finish. Other considerations were possible living arrangements, visa obstacles, transportation, and health care facilities.

These and other factors provided the systematic underpinning as the evaluation team sifted through the wide array of programs available. The objective of the study was to select a limited number of postgraduate programs from the thousands of programs available, and build institutional profiles on each of the universities.

Follow-up visits to the 18 universities included a broad-based institutional assessment conducted by representatives from the research team. Each assessment produced an institutional profile that examined university issues such as setting, type, size, climate, stability, linkages, enrollment procedures, facilities, intellectual resources, financial resources, and professor accessibility. The development of an institutional profile on each university provided the data necessary to perform a comparative analysis of the institutions. The comparative analysis of the profiles furnished the conclusions needed to judge the merits of placing fellows in various institutions and to develop a new Africa-based fellowship program.

Results

The objective of the survey was not to conduct an ordinal ranking in order to determine the number one program in a given field of study. Rather, the ranking survey simply highlighted the institutions in which we might find a top program. Clusters of countries where strong programs emerged from the initial ranking study included universities in (the eastern group) Kenya, Uganda, and Tanzania; (the western
group) Ghana, Nigeria, and Côte d'Ivoire; (and the southern group) the Republic of South Africa, Zimbabwe, Botswana, and Swaziland.

The second step of the study included the building of institutional profiles for each university through on-site evaluations. The institutional profiles not only assisted in establishing the quality of top programs, but also provided a broader understanding of the institutional environment and political situation.

Institutional Stability

It makes little difference if a university has a number one postgraduate program in a given field of study if the institution is unstable. It is nearly impossible for a fellow to get an education if the university is frequently on strike. An excellent program can quickly erode due to heightened attrition resulting from an unstable environment and associated costs.

Due to the number of excellent programs in unstable universities, such an exclusionary rational criterion is unfortunate, but programmatically essential. While a few universities were not considered stable enough to place fellows at this time, it is important to monitor these institutions in the future with the hope of assisting in the process of capacity building.

Institutional Resources

One important indicator of future institutional attrition is the resources available to the university. Although specific budgetary data are often difficult to obtain, we were able to learn some important realities about future financial situations. Many of the universities visited will continue to operate in relatively unstable budgetary environments. As a result, we can expect further attrition over the next decade, barring some external intervention.

Although the future for many South African universities is unclear at this time, one reality is quite likely. Many of the universities, such as Stellenbosch, Cape Town, Witwatersrand, Natal, and Pretoria, are expecting as much as a 20% cut in federal funding over the next several years. As a result, notable institutional attrition can also be expected in many of South Africa's historically white universities. Universities that may not suffer cuts will likely be the historically black universities such as Fort Hare. At any rate, significant changes may be in store for the South African educational landscape.

Top African Postgraduate Programs

A handful of good programs were identified, as presented in the following list, in social (Table 1), agricultural (Table 2), and environmental sciences (Table 3). Many of these programs may continue to be excellent candidates for accepting fellows and for the provision of institutional capacity building.
Table 1  
Top African Post Graduate Programs in Social Sciences

<table>
<thead>
<tr>
<th>Discipline of study</th>
<th>University of study</th>
</tr>
</thead>
</table>
| Agricultural economics | University of Pretoria  
                      | University Nat. de Côte d'Ivoire  
                      | University of Zimbabwe |
| Agricultural extension | University of Swaziland  
                       | Sokoine University of Agriculture |
| Anthropology     | University of Cape Town  
                 | University of Western Cape |
| Sociology        | University of Natal  
                 | University of Zimbabwe |

Table 2  
Top African Post Graduate Programs in Agricultural Sciences

<table>
<thead>
<tr>
<th>Discipline of study</th>
<th>University of study</th>
</tr>
</thead>
</table>
| Animal science      | University of Pretoria  
                      | University of Zimbabwe  
                      | University of Nairobi |
| Crop science        | University of Natal  
                      | Sokoine University of Agriculture |
| Soil science        | University of Natal  
                      | Alexandria University |
| Veterinary medicine | University of Pretoria  
                      | University of Zimbabwe |
Table 3
Top African Post Graduate Programs in Environment Sciences

<table>
<thead>
<tr>
<th>Discipline of study</th>
<th>University of study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecology/NRM</td>
<td>University of Cape Town</td>
</tr>
<tr>
<td></td>
<td>University of Witwatersrand</td>
</tr>
<tr>
<td></td>
<td>University of Natal</td>
</tr>
<tr>
<td></td>
<td>University of Zimbabwe</td>
</tr>
<tr>
<td></td>
<td>University of Nairobi</td>
</tr>
<tr>
<td>Forestry</td>
<td>Sokoine University of Agriculture</td>
</tr>
<tr>
<td></td>
<td>University of Stellenbosch</td>
</tr>
<tr>
<td>Range Management</td>
<td>University of Pretoria</td>
</tr>
<tr>
<td></td>
<td>University of Natal</td>
</tr>
<tr>
<td></td>
<td>University of Zimbabwe</td>
</tr>
</tbody>
</table>

Implications

Although the literature is flush with issues on attrition in relation to African higher education, a total vacuum exists in the literature concerning the academic assets that have prevailed in African higher education. In addition to being a significant first contribution to the literature, the identification of top postgraduate programs and stable university environments provides an invaluable tool for educators, donors, and development practitioners. The study furnishes critical leverage points for donors interested in creating African fellowship partnerships in agricultural, environmental, and rural social science.

During the past four decades, numerous studies have highlighted an assortment of problems in African higher education that range from institutional attrition to unabridged instability (Mattocks, 1991; Saint, 1992; & Steele, 1991). It is clear that African higher education is in trouble, serious trouble. In fact, in a general discussion on the attrition of African higher education at the 7th General Conference on Agricultural Research and Development in 1991 held at the United Nations Environmental Program Headquarters in Nairobi, one dean from a leading East African university quipped:

"The international donor community started something that they decided not to finish, then they come back years later and tell us that our universities are a mess. African higher education has basically been relegated to hell in a hand-basket as far as most donors are concerned."

On the other hand, many donors argue that some problems are so big that no one knows quite how to handle them. African higher education is considered by many to be such a tangle that few dare to even attempt to propose a solution. The result is a wringing of hands on all sides of the fence.

Yet, millions of dollars are spent by the international donor community on an annual basis to support African nationals in fellowship programs. The World Bank alone estimates it spends approximately 50 million dollars a year to provide fellowships for African nationals in western universities. However, in recent discussions at the Bank the relevance of western training has been called into question. Coupling the issue of educational relevance with questionable fellow return rates provides impetus for serious reconsideration of how these...
funds are spent.

Simply sending a portion of the Bank's postgraduate fellows to first-rate African programs would generate significant revenue. Such an approach, combined with small institutional development opportunities, would result in keeping strong programs strong. Over the long-term, such policies would assist in the development of flagship African higher education programs.

References


FACTORS ASSOCIATED WITH ADMINISTRATORS' ATTITUDES TOWARD AGRICULTURAL EDUCATION AT THE PRIMARY SCHOOL LEVEL IN BELIZE

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Abstract

The economy of Belize is heavily dependent on agriculture. Because of its importance, attempts were made to integrate instruction about agriculture into the curriculum at the primary school level. The attempts proved to be unsuccessful and prompted this study of implementation barriers. The objectives of the study were to determine the attitudes of administrators in the Belize Ministry of Education toward agricultural education at the primary school level, and factors related with these attitudes. All senior level administrators in the Ministry of Belize were included in the study. The findings suggest that administrators tend to have a moderately favorable attitude toward agricultural education at the primary school level. Factors found to be associated with attitude were age, level of education, and years experience in public education. Based on the findings and conclusions, the principal recommendation was to offer in-service education programs for senior level administrators with the goal of drawing their attention to the economic and educational value of agriculture in Belize.

Agriculture is important to the economy of Belize (USAID, 1988). Most citizens of Belize earn their living from agriculture with important sources of income from fishing, forestry, and livestock (Compton, 1994). Because of Belize's economic dependency on agriculture, the Belize Ministry of Education has attempted to include instruction about agriculture at the primary school level (Green, Eck, Hurwitz, Keith & Massey, 1988). This level was targeted because most of Belize's population only obtains a primary school education (Massey, 1986). Green et al. (1988) suggested that including instruction about agriculture at the primary school level would help the youth of Belize become agriculturally literate and eventually contribute to the economic well-being of the country. Thus, seeking out administrators' attitudes toward agricultural education at the primary school level would strengthen position statements to promote efforts to include instruction about agriculture at the primary school level in Belize.

Literature Base

Although there is limited information on the institutionalization of agricultural education in developing countries (Swanson, Sigman, Koehmen & Rassi, 1981), countries in Latin America and Africa, and Bangladesh and the Commonwealth of Dominica among others are making strides to do so. Macias-Lopez (1990) reported that in Latin America agricultural
education is a relatively new discipline and only limited research is available. In several African countries, efforts have failed to regularize agricultural education within the school system, in part due to lack of policy (Craig, 1990; Galabawa, 1990; Magalula, 1990). Eaton and Bruening (1994) reported that school administrators in the Bangladesh Ministry of Education were taking steps to regularize instruction about agriculture within the school system. The Commonwealth of Dominica was reported to be in the process of integrating instruction about agriculture within the established school curriculum area (Education Sector Plan for Educational Development in the Commonwealth of Dominica, 1994).

Belize, like many other countries, has struggled to systematically include instruction about agriculture in the primary school curriculum. In this effort, the Belize Ministry of Education attempted to include instruction about agriculture in the primary level schools by integrating it into the academic curriculum. In 1975, with the assistance of Cooperation of American Relief Everywhere (CARE), the Ministry of Education introduced the Relevant Education for Agriculture and Production (REAP) program to work toward this goal (Green et al., 1998; Eck, 1986).

Of the 150 rural primary schools of Belize, 55 schools were involved in the REAP program during the first decade of its existence. Unfortunately, as CARE phased out REAP, the program gradually declined (Green et al., 1988). Bennett & Eck (1990) attributed the program’s decline and eventual demise to the lack of policy for program continuity, and lack of support by senior level administrators in the Ministry of Education.

Administrative support is vital to the success of educational programs. School administrators provide the human, financial, and instructional support necessary for program development and implementation (Rebore, 1991). Burnett & Miller (cited in Magill & Leising, 1990) suggested that "the role of school administrators in agricultural programs may be a function of their attitude toward these programs" (p.147). Fishbein & Ajzen (1975) indicated that attitudes can be used to predict a person's behavior. Therefore, as efforts are advanced to institutionalize instruction about agriculture at the primary school level in Belize, it is important to determine the attitudes of senior level administrators in the Belize Ministry of Education toward agricultural education at this level.

**Purpose and Objectives**

The purpose of this study was to determine the attitudes of senior level administrators in the Belize Ministry of Education toward agricultural education at the primary school level in Belize, and to determine the association of demographic factors with administrators' attitudes. The following objectives guided the study:

1. Examine selected demographic characteristics of senior level administrators in the Belize Ministry of Education.
2. Determine the attitudes of senior level administrators in the Belize Ministry of Education toward agricultural education at the primary school level.
3. Determine the relationship between attitudes toward agricultural education at the primary school level and selected demographic characteristics of senior level administrators in the Belize Ministry of Education.

**Procedures**

The design of the study was descriptive-correlational research (Ary, Jacobs & Razavieh, 1996). The population under investigation consisted of all senior level administrators in the Belize Ministry of Education during the 1994-1995 academic school year. In this study, senior level administrators are defined as those persons who have administrative responsibilities and a direct impact on educational decisions in Belize. Because the number of senior level administrators in the Belize Ministry of Education was small (N=40), a census study was...
employed.

**Instrumentation**

Data were collected using an instrument developed by the researchers to accomplish the objectives of the study. The data collection instrument consisted of two sections.

Section one contained a 7-point semantic differential scale ranging from 1 (Unfavorable) to 7 (Favorable) and contained 15 bipolar adjectives. Isaac & Michael (1990) served as a source of reference in developing the structure of the semantic differential scale as the means of assessing attitudes. Respondents were asked to rate the construct, Agricultural Education at the Primary School Level, on each bipolar adjective. Examples of bipolar adjectives included Desirable/Undesirable, Important/Unimportant, Positive/Negative. Using an equidistant line drawn between each paired expression, with the assumption that a mark in the middle represents a response that is neutral, respondents could rate the construct on a scale from 1 to 7. To reduce ambiguity and misinterpretation of the construct, an adaptation of the National Research Council's (1988) definition of agricultural education was provided: Instruction that integrates basic concepts of food and fiber and its related historic, economic, and environmental factors within the established school curriculum. To reduce response set, the direction of the bipolar items was reversed in random fashion.

Section two of the instrument was designed to gather personal characteristics of the respondents, including age, gender, education level, years employed in public education, and prior enrollment in courses in agriculture and/or agricultural education.

Face and content validity were established using a panel of five experts in the Department of Agricultural and Extension Education at New Mexico State University consisting of three faculty and two graduate students with knowledge about instrumentation. The instrument was revised to reflect the panel's input regarding clarity of directions.

Additionally, the instrument was assessed for reliability through a pilot test using 35 purposefully selected international students at New Mexico State University whose characteristics approximated the subjects under investigation. All pilot test subjects were either graduate or undergraduate students who had administrative experience in the field of agriculture and/or education. From the pilot test data, a Cronbach's alpha coefficient (as a form of internal consistency) was calculated. The instrument yielded a reliability estimate of .88, which was deemed acceptable. Therefore, no changes were made to the instrument.

**Data Collection**

To facilitate data collection, one researcher traveled to Belize to distribute the questionnaire to the subjects. While in Belize and before collecting data, the researcher contacted subjects to solicit their participation and notify them of the forthcoming questionnaire. Because of the slow mail system in Belize, the questionnaires were hand delivered. At delivery, subjects received a packet containing a cover letter structured according to Dillman (1978), the questionnaire, and a self-addressed return envelope. Two weeks after the initial delivery, 90% (N=36) of the questionnaires were completed and returned. In efforts to gather data from the four nonrespondents, the Director of the Vocational Technical Training Unit in Belize made follow-up visits to these individuals. Unfortunately, the attempts were futile and the four questionnaires remained outstanding.

**Data Analysis**

The data were analyzed using SPSS/PC (Version 6.1). Descriptive statistics such as measures of central tendency and variability appropriate for the level of measurement of the data were reported. Correlational analyses such as Pearson Product-Moment, Point-biserial, and Spearman's rho correlation coefficients were used to describe the magnitude and direction of relationships between variables. The magnitude of the relationships was interpreted using Davis'
Because this was intended to be a census study, population parameters were used and no attempt was or should be made to extrapolate these data beyond the subjects studied. The fact that responses could not be obtained from all 40 respondents is a limitation.

**Results**

**Demographic Characteristics**

The majority of respondents, 58.3%, were male (Table 1). The average age was 41.4 years with a range from 24 to 63 years. In terms of highest level of education attained, respondents ranged from having a high school diploma (5.6%) to a doctorate (5.6%). However, the largest percentage of respondents reported having a bachelor's degree (44.4%), followed by a master's degree (33.3%), and an associate's degree (11.1%). The number of years of experience working in public education reported by respondents ranged from 3 to 33 with a mean of 18.9 years.

Respondents were asked to report their participation in courses related to agriculture or agricultural education. Of the 36 respondents, 44.4% indicated they were enrolled in agriculture and/or agricultural education courses at some time during their formal education.

**Attitudes of Senior Level Administrators**

Using a 7-point semantic differential scale (1 being unfavorable and 7 favorable), respondents were asked to indicate their attitudes toward agricultural education at the primary school level on 15 bipolar adjectives. Overall, respondents had a mean attitude score of 5.38 (Table 2). The standard deviation from the mean attitude score was .87, with individual scores ranging from 2.2 to 6.6.

**Factors Associated with Attitudes**

To determine factors (demographic characteristics) associated with respondents' attitudes toward agricultural education at the primary school level, correlation coefficients were calculated. The data indicated that gender had a negligible inverse relationship ($\rho_{pb}=-.03$) with respondents' attitudes toward agricultural education at the primary school level (Table 3). Similarly, the number of years respondents worked in public education had a low inverse relationship ($\rho=-.13$) with their attitudes toward agricultural education at the primary school level.

Conversely, age ($\rho=.11$), level of education ($\rho_s=.10$), and prior enrollment ($\rho_{pb}=.07$) in agriculture and/or agricultural education courses had a positive relationship with respondents' attitudes toward agricultural education at the primary school level.
Table 1  
Characteristics of Senior Level Administrators in the Belize Ministry of Education (N=36)  

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency</th>
<th>Percent</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>41.7</td>
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<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>21</td>
<td>58.3</td>
<td></td>
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<tr>
<td>Age</td>
<td></td>
<td>41.4</td>
<td>8.43</td>
<td>24 - 63</td>
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<tr>
<td>Highest Level of Education</td>
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<td>High School</td>
<td>2</td>
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</tr>
<tr>
<td>Associate</td>
<td>4</td>
<td>11.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelors</td>
<td>16</td>
<td>44.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masters</td>
<td>12</td>
<td>33.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctorate</td>
<td>2</td>
<td>5.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work Experience in Public Education (years)</td>
<td>18.9</td>
<td>9.73</td>
<td>3 - 33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2  
Attitudes of Senior Level Administrators in Belize Toward Agricultural Education at the Primary School Level (N=36)  

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Education</td>
<td>5.38</td>
<td>.87</td>
<td>2.2 - 6.6</td>
</tr>
</tbody>
</table>

Note. Attitude scale is based on: 1=Unfavorable to 7=Favorable.

Table 3  
Relationship Between Attitudes Toward Agricultural Education at the Primary School Level and Selected Demographics (N=36)  

<table>
<thead>
<tr>
<th>Factor</th>
<th>Correlation Coefficient</th>
<th>Magnitudea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>ρ_{pb}=-.03^b</td>
<td>Negligible</td>
</tr>
<tr>
<td>Age</td>
<td>ρ = .11</td>
<td>Low</td>
</tr>
<tr>
<td>Years in Public Education</td>
<td>ρ =-.13</td>
<td>Low</td>
</tr>
<tr>
<td>Highest Level of Education</td>
<td>ρ_s = .10^c</td>
<td>Low</td>
</tr>
<tr>
<td>Enrollment in Agricultural Courses</td>
<td>ρ_{pb}=.07^d</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Note.  
Attitude scale is based on: 1=Unfavorable to 7=Favorable.  
^a Based on Davis' convention (1971).  
^b Coded: 0=Female; 1=Male.  
^c Coded: 1=High School; 2=Associate; 3=Bachelors; 4=Masters; 5=Doctorate.  
^d Coded: 1=No; 2=Yes.
Conclusions and Recommendations

Information about agricultural education in developing countries is limited. The literature available suggests that efforts are being made to include instruction about agriculture in existing curricula with varying rates of success.

Administrators are central to any educational endeavor. The success or failure of any program rests upon the decisions and support offered by its administrators. The Belize Ministry of Education has been unsuccessful in systematically reinstating instruction about agriculture at the primary school level since the REAP program was phased out in the early 1970s. Agriculture is too important in Belize to leave idle the efforts to seek support for instruction about agriculture at the primary school level. Toward this effort, the following conclusions and recommendations are offered. The results of this study reveal that senior level administrators in the Belize Ministry of Education possess a moderately favorable attitude ($\mu = 5.38$) toward agricultural education at the primary school level. As such, there is margin for improving attitudes of senior level administrators in the Belize Ministry of Education. One strategy to adjust senior level administrators' attitudes toward agricultural education at the primary school level in a more favorable direction is to offer in-service education programs. At these in-service education programs, the attention and focus of senior level administrators should be drawn to the importance of agriculture to the economy of Belize, agricultural literacy as an educational issue, and the long-term benefits to its citizens by educating the youth about agriculture through the integration of agricultural education into the curriculum beginning at the primary level.

A second strategy could be that individuals or groups of individuals attempting to initiate instruction about agriculture at the primary school level in Belize should seek out administrators who possess characteristics that were positively associated with attitudes toward agricultural education at the primary school level. Older male or female senior level administrators with high education levels and those who have taken coursework in agriculture or related areas should be targeted. In working with these senior level administrators, efforts should be exerted to pursue and develop policy that supports and delivers agricultural education at the primary school level.

Senior level administrators who possessed a higher number of years in public education were found to have a negative attitude toward agricultural education at the primary school level. These senior level administrators should be specifically targeted for in-service education.

An overall strategy to influence positively all senior level administrators' attitudes toward agricultural education at the primary school level would be to showcase exemplary agricultural education programs within and outside Belize.

It is recommended that stakeholders, administrators, and policy makers in Belize use these findings, conclusions, and recommendations as a foundation for making decisions in the move to revitalize agricultural education at the primary level.

While failed attempts to implement agricultural education at the primary school level can be attributed to a myriad of factors, this study showed that administrative attitude can be a potential barrier. Research should be continued to identify other barriers that go beyond the scope of this study that have kept the Belize Ministry of Education from pledging its full support for instructional programs so central to the economy. Research questions should focus on teachers to study factors such as attitudes, teacher training, and competencies. Additionally, curriculum availability and development, and Ministry of Education budgetary issues should be investigated as plausible barriers.
References


Eck, D. (1986). Relevant Education for Agriculture and Production (REAP). Conference on Science Education Research in Latin America and the Caribbean, University of the West Indies, Port of Spain, Trinidad.


PEOPLE-CENTERED DEVELOPMENT EMPOWERS SMALL
INDIGENOUS FARMERS TO DOUBLE FOOD PRODUCTION

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Abstract

A people-centered participatory approach to the identification and dissemination of appropriate cover crops has enabled small indigenous farmers in Northern Potosi, Bolivia to begin doubling their potato production. The two indigenous languages spoken in the area have become an asset rather than a barrier because of farmer-to-farmer extension. In addition, the leadership training process has enhanced local initiative, pride and dignity, an essential motor of all sustainable development in areas that have no agricultural research and extension services.

"Probably well over a billion people depend for their livelihoods on the complex, diverse and risky forms of agriculture which have been poorly served by agricultural research.”
(Chambers, Pacey & Thrupp, 1991)

A specific example of this problem is found in Northern Potosi, Bolivia (Latitude S 19°35’; Longitude W 64° 45’). This area of about 15,000 square kilometers has a population of 212,000 people (UNICEF, 1992), the majority of whom are indigenous Quechua and Aymara subsistence farmers. Infant mortality in Northern Potosi is 200 per 1,000 live births, more than twice the national average. No government agricultural research or extension services are offered in the area; 85% of the people are illiterate; two different indigenous languages are spoken in addition to Spanish, the official national language; and average family income is estimated to be US $300 per year (UNICEF, 1992). In addition, the roads are often closed three to five months of the year due to rains, cultivation occurs on slopes of five to fifty degrees, the elevation ranges from 2,800 to 3,900 meters above sea level, and the average rainfall is 594 mm per year.

Perhaps a solution to this problem can be found which is both feasible and humanistic. One strategy that has been tried and shown to work in various settings is involving people in decisions that can improve their livelihood and help shape their destiny. This people-centered development approach can be contrasted with the socio-economic, technological approach to growth that minimizes, and often excludes, the involvement of the people who are the intended beneficiaries of development programs.

The principle of clientele involvement is a fundamental tenet in extension education programming (Sanders, 1967). The farming systems research and extension approach incorporates farmer involvement strategies in assessing farmer needs and problems, designing practical research to address these needs and problems, and bringing solutions for testing and general application on farmers’ holdings (Shaner, 1984). In a broader country-
development context, Korten (1990) argues that the "development as growth" paradigm practiced over the last four decades in bilateral and multilateral assistance programs emphasizing "growth in the market value of economic output" at the expense of "human and environmental considerations" must give way to a "development as transformation" paradigm focused on "...transforming our institutions, our technology, our values, and our behavior consistent with our ecological and social realities." (pp. 3-4). Korten's "people-centered development" paradigm is based on principles of (a) justice that assures all people the opportunity for a decent human existence, (b) sustainability and stewardship of the earth's natural resources for future generations, and (c) inclusiveness to assure everyone an opportunity to be a recognized and respected contributor to family, community and society (Korten, 1990, p. 4). He argues further that because the needed transformation is broadly based, "... voluntary citizen action will have an essential role." (Korten, 1990, p.5 ). A number of non-governmental organizations throughout the world are giving attention to a people-centered development vision. This is only natural, as their work envisions active, voluntary involvement of and action by citizens.

Purpose

The purpose of this paper is to show how a people-centered agricultural development program of a non-governmental organization that promoted a participatory approach to developing technology helped small indigenous farmers identify and disseminate a cover crop which significantly improved the food security of one of the poorest areas of South America.

Procedure

World Neighbors, a non-governmental organization founded in 1951 to help marginalized people build their capacity to meet basic needs, has developed a people-centered methodology to promote sustainable development. The methodology consists of (a) selecting marginal communities based on need and opportunity, (b) establishing a relationship of mutual trust, (c) strengthening local capacity to identify problems, analyze root causes, and identify and prioritize possible courses of action to address the problems, (d) working with the people to try out new ideas by starting small and staying practical to generate early enthusiasm, (e) strengthening local capacity to evaluate and document results, (f) strengthening local capacity to access additional resources from the outside world, and (g) building on experience so that the role of World Neighbors changes from being a direct program partner to a catalyst for wider impact through replication, dynamic program transformation, influencing other agencies, and policy reform (World Neighbors, 1993).

When World Neighbors began working in Northern Potosí in 1974 families concluded that their first development priority was to improve the food security of the area. This was necessary because food supply was often inadequate due to frost, hail and periodic drought. Most farmers felt that the quickest and simplest way to increase agricultural production was to test new varieties. These were acquired from the nearest experiment station eight hours away. The varieties had been developed and selected by agricultural research stations at lower elevations, under favorable climate and optimal production conditions, and fertilized at much higher levels than traditionally used by small farmers in Northern Potosí. So, while the first technology of importing new varieties seemed simple enough, it did not produce meaningful results. Another drawback was the lack of farmer involvement in the development of this technology.

When it became apparent that these improved varieties also required better fertilization practices, program leaders imported commercial fertilizers and encouraged farmers to supplement their traditional fertilization practices. This also produced very sporadic results. In the first place, it was very costly and difficult to consistently import fertilizer into this remote
area. Secondly, it was very difficult to teach illiterate Aymara and Quechua farmers how to calculate the appropriate fertilizer applications. Thirdly, they had so little cash to purchase fertilizer that they generally applied it in miniscule quantities. This proved to be an ineffective use of the farmers' very limited natural and financial resources.

Despite these problems, farmers walked for as long as 24 hours round trip to attend the monthly, two-day participatory technology development courses given by World Neighbors. This occurred because World Neighbors was the first agency that had as its purpose helping farmers help themselves in ways that called forth maximum commitment of their own resources and conserved to the maximum degree their self-respect (Bunch, 1991). World Neighbors demonstrated that it was dedicated to encourage indigenous responsibility, indigenous pride and indigenous leadership by speaking the language of the people at seminars, motivating them to share their own creative ideas about how to solve their problems, and then encouraging them to test and disseminate the ideas that worked best (Peters, 1976).

As a result of these initiatives, World Neighbors Programs in Central America began to significantly improve the yields of small farmers with cover crops. To show test results of these programs, World Neighbors Andean Area arranged a tour for 13 of the best farmer trainers of trainers to visit these programs. The farmers from South America were most impressed with the results of mucuna (Flores, 1995) or the velvet bean as it is called in that area. When grown in association with corn on poor soils, the height of the corn stalks literally doubled in size, increasing from one meter to two meters. This guaranteed farmers a minimum of one to two ears of corn per plant. Unfortunately, mucuna does not grow at elevations above 2,200 meters, which is less than the elevation of small farms in the Andean Mountains of Bolivia, Peru and Ecuador.

Toward the end of the visit, Ing. Milton Flores, the Director of Centro Internacional de Información Sobre Cultivos de Cobertura (CIDICO), was invited by Roland Bunch, the host of our group, to try and help the farmers find an alternative. He informed us he had found research done in Germany that reported lupines (Lupinus mutabilis) had worked well as a cover crop. He recommended we test it in the higher elevations of the Andean Mountains.

At first, our co-workers were incredulous that a crop, native to the area called Tarwi, which was grown on a very small scale in one of the five programs supported by World Neighbors, would improve soil fertility if turned under as a green manure. Further investigation identified research done at the University of California at Davis (Larson, Cassman & Phillips, 1989) which confirmed that this lupine had fixed up to 220 kg/ha of nitrogen when turned under as a green manure at the flowering stage.

With the encouragement of program leaders, a few small farmers decided to conduct small experimental field trials (Ruddell, 1995) at higher elevations. The lupine was planted on fallow land with no additional fertilizer when the rainy season began in October. After sowing it in furrows, oxen covered it with a harrow. No other fertilizer or cultural practices were required until it reached the flowering stage four months later, in late February. At that point, indigenous program leaders encouraged all farmers to turn the crop under as a green manure, but not every family did. Some of the women were so impressed with its performance at higher elevations that they preferred to let it mature and harvest the nutritious beans.

Prior to turning the crop under at the flowering stage, the green matter was weighed. The biomass averaged 17 Mg/ha. Oxen pulling steel ploughs then turned the lupines under. As each successive furrow was opened, the previous furrow was covered. When incorporated in the soil, this organic material helped retain water in the root zone, improved the tilth of the soil for root growth, and reduced water runoff on slopes.
Peasant farmers played a critical role in conducting this applied research of comparing the effect of lupine (green manure) and commercial fertilizer on potato yield (Ruddell, 1995). Their participation was the only way this idea could eventually be tested in a wide variety of micro-climates that ranged from 2,200 to 4,000 meters above sea level. The research trials, which had three replications each, were conducted by peasant farmers on their own farms to ensure that the varieties would grow well under local farm conditions. Once proven, the peasant farmers who liked and benefitted from the trial began disseminating it in their own language to other farmers.

Results

Field Trials

Data provided by two field trials conducted in Northern Potosi, Bolivia are presented.

The first trial was carried out by Thomas Villca in the community of Luqu. Lupines were planted as a cover crop on sloping land in 1990 and turned under in February 1991. On October 6, 1991, 25 small farmers planted the potato varieties "Yunaruna" and harvested it on April 8, 1992. The growing season had normal rainfall but suffered from a hailstorm on March 2, 1992.

Table 1 shows the analysis of variance of potato yield from six different fertilizer treatments. The effect of replication was not statistically significant, but the effect of fertilization treatment was highly statistically significant.

Table 2 shows that the yield of potatoes from farmers' current practice was 1.76 Mg/ha compared to a yield of 8.57 Mg/ha, a 487% increase, in the fields in which lupines were planted as a cover crop during the previous year. It is also interesting to note that the difference in yields from the commercial fertilizer treatment and the lupine treatment was not statistically significant.

The second trial was carried out by Pablo Choque in the community of Vitora. Lupines were planted as a cover crop on a slope at approximately 11,000 feet elevation in November 1993 and turned under in March 1994. Pablo planted the same site with the potato variety "Waycha" on October 24, 1994. Sixteen farmers participated in the experiment. The trial was harvested on May 28, 1995.

Table 3 shows the analysis of variance of potato yield from eight different fertilizer treatments. The effect of replication was not statistically significant, but the effect of fertilization treatment was highly statistically significant.
### Table 1
Analysis of Variance of First Potato Fertilization Trial, Luqu Community, Northern Potosi, Bolivia 1991-92

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replication</td>
<td>2</td>
<td>2.91</td>
<td>1.455</td>
<td>1.17</td>
<td>NS</td>
</tr>
<tr>
<td>Fertilization</td>
<td>5</td>
<td>215.05</td>
<td>43.010</td>
<td>34.63</td>
<td>.01</td>
</tr>
<tr>
<td>Error</td>
<td>10</td>
<td>12.42</td>
<td>1.242</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>238.38</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2
Potato Yields From First Fertilization Trial, Luqu Community, Northern Potosi, Bolivia, 1991-92

<table>
<thead>
<tr>
<th>Fertilizer Treatment</th>
<th>Yield (Mg/ha)</th>
<th>Differences(^{a})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lupines(^{b}) + commercial fertilizer(^{c})</td>
<td>16.44</td>
<td>a</td>
</tr>
<tr>
<td>Lupines + sheep manure(^{d})</td>
<td>13.19</td>
<td>b</td>
</tr>
<tr>
<td>Commercial fertilizer</td>
<td>10.19</td>
<td>c</td>
</tr>
<tr>
<td>Lupines</td>
<td>8.57</td>
<td>c</td>
</tr>
<tr>
<td>Sheep manure</td>
<td>5.56</td>
<td>d</td>
</tr>
<tr>
<td>Farmers' current practice</td>
<td>1.76</td>
<td>e</td>
</tr>
</tbody>
</table>

\(^{a}\) Based on LSD of 2.03 Mg/ha calculated from Table 1. Treatments with different letters are significant at p=.05.  
\(^{b}\) Lupines incorporated as green manure.  
\(^{c}\) Commercial fertilizer applied at the equivalent of 80 kg/ha of N and 120 kg/ha of P\(_{2}\)O\(_{5}\).  
\(^{d}\) Sheep manure applied at the equivalent of 10 Mg/ha. Its nutrient content was not determined.

### Table 3
Analysis of Variance of Second Potato Fertilization Trial, Vitora Community, Northern Potosi, Bolivia, 1994-95

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replication</td>
<td>2</td>
<td>0.27</td>
<td>0.14</td>
<td>0.19</td>
<td>NS</td>
</tr>
<tr>
<td>Fertilization</td>
<td>7</td>
<td>246.91</td>
<td>35.27</td>
<td>48.99</td>
<td>.01</td>
</tr>
<tr>
<td>Error</td>
<td>14</td>
<td>10.06</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>257.24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4 shows a different set of fertilizer treatments in the second fertilizer trial compared with the first trial. The treatment that received lupines as a cover crop increased potato yield to 7.36 Mg/ha, almost double the average yields in the area ("Secretaría Nacional de Desarrollo Rural, Vecinos Mundiales", 1995), assuring the farmers food security plus a surplus they could sell for cash to finance further agricultural improvements.

The variable costs per hectare of using lupines and commercial fertilizers are compared in Table 5. Lupine cost totalled $135.20 or 72.5% of the cost of using commercial fertilizers, namely $186.37, to achieve the same level of yield, 7.4 Mg/ha. In addition, there is a marked difference in the cash outlay required. In the case of lupine, the primary expense is labor, which is frequently traded. The only cash outlay for agricultural supplies with the cover crop was US $18/ha for lupine seed, which is within the means of families, whose average annual income is US $300. In contrast, the US $167.38 required for the purchase of chemical fertilizers would cause economic ruin, even if the supplies of fertilizer were available. Even more important is the fact that the use of lupines as a cover crop eliminates the need for the poorest families to rent animals from the wealthier members of the village to fertilize their land prior to planting. Finally, it is simple to transport seed to a central location on a bus or truck and then carry it anywhere on foot in this isolated area.

Table 4
Potato Yields From Second Fertilization Trial, Vitora Community, Northern Potosi, Bolivia, 1994-95

<table>
<thead>
<tr>
<th>Fertilizer Treatment</th>
<th>Yield (Mg/ha)</th>
<th>Differences a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lupines + sheep manure + commercial fertilizer f</td>
<td>14.86</td>
<td>a</td>
</tr>
<tr>
<td>Lupines + sheep manure d</td>
<td>12.50</td>
<td>b</td>
</tr>
<tr>
<td>Lupines + commercial fertilizer</td>
<td>10.69</td>
<td>b</td>
</tr>
<tr>
<td>Lupines</td>
<td>7.36</td>
<td>c</td>
</tr>
<tr>
<td>Sheep manure + commercial fertilizer</td>
<td>6.94</td>
<td>c</td>
</tr>
<tr>
<td>Sheep manure</td>
<td>4.58</td>
<td>d</td>
</tr>
<tr>
<td>Commercial fertilizer</td>
<td>2.50</td>
<td>e</td>
</tr>
<tr>
<td>Farmers' current practice</td>
<td>1.39</td>
<td>e</td>
</tr>
</tbody>
</table>

a Based on LSD of 1.49 Mg/ha calculated from Table 3. Treatments with different letters are significant at p=.05.

b Lupines incorporated as green manure.

c Commercial fertilizer applied at the equivalent of 80 kg/ha of N and 120 kg/ha of P<sub>2</sub>O<sub>5</sub>.

d Sheep manure applied at the equivalent of 10 Mg/ha. Its nutrient content was not determined.
Table 5
Variable Costs of Using Lupines and Commercial Fertilizers for Potato Production on Peasant Farms in Northern Potosi, Bolivia

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost/ha (US $)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lupines</strong></td>
<td></td>
</tr>
<tr>
<td>Seed (60 kg)</td>
<td>18.00</td>
</tr>
<tr>
<td><strong>Planting</strong></td>
<td></td>
</tr>
<tr>
<td>Oxen (5 oxen days)</td>
<td>17.00</td>
</tr>
<tr>
<td>Labor (10 person days)</td>
<td>21.20</td>
</tr>
<tr>
<td>Food and coca for labor</td>
<td>28.00</td>
</tr>
<tr>
<td>Oxen for turning lupines under (15 oxen days)</td>
<td>51.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>135.20</td>
</tr>
<tr>
<td><strong>Commercial fertilizer</strong></td>
<td></td>
</tr>
<tr>
<td>Cost of fertilizer(^a)</td>
<td>167.38</td>
</tr>
<tr>
<td>Transporting fertilizer</td>
<td>13.35</td>
</tr>
<tr>
<td>Labor for spreading fertilizer (2 person days)</td>
<td>4.24</td>
</tr>
<tr>
<td>Food and coca for labor</td>
<td>1.40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>186.37</td>
</tr>
</tbody>
</table>

\(^a\) Fertilizer applications were equal to 4 bags of ammonium phosphate, 2 bags of urea, and 1 bag plus 10 kg of triple super-phosphate, totaling 80 kg of N and 120 kg of P\(_2\)O\(_5\)/ha.

Dissemination of lupine for green manure

In response to these favorable results, 18 field days attended by 276 farmers with approximately 30% women, were organized by indigenous peasant farmer-leaders to motivate and train neighboring farmers to adopt the practice of lupine as a green manure. As a result of this training and adoption of the practice, 209 families have significantly increased potato production on their land. Sixty-one farmer extension agents in five programs supported by World Neighbors continue to replicate and disseminate the practice throughout the region. Farmers have noted that while lupines do poorly in waterlogged soils, they produce well in soils that are well drained. This particular species of lupine also works best at elevations of 3,000 to 4,000 meters above sea level. In summary, an investment of US $18/ha in lupine seed normally enables farmers to raise an additional 3 to 4 Mg/ha of potatoes worth US $1,200. To date, World Neighbors knows of no better cover crop for temperate climates in high elevations.

After observing the systematic manner in which the results of the trials were documented by indigenous farmers, CIMMYT invited Ing. Julio
Beingolea Ochoa, World Neighbors staff member and former professor of Agronomy from the University of Huamanga, Peru to share his experience in training 60 small farmers (Beingolea, 1993) to use lupines as a cover crop. The national newspaper, Presencia in Bolivia, and the Peruvian magazine, Agronoticias (Vecinos Mundiales, 1993), also published an article on the results, encouraging farmers to continue to look for and test new cover crops to improve crop production.

Between September 1993 and December 1994, 120 volunteer farmer promoters trained by World Neighbors gave community seminars on this topic to 1,936 men and 794 women in 120 communities in the provinces of Charcas and Alonzo Ibañez. This generated a number of additional trials in elevations that ranged from 2,300 to 4,000 meters above sea level. These site-specific trials conducted by the farmers themselves demonstrated that new varieties of lupine and/or other legumes, such as vetch, need to be tested for lower elevations; highlighting once again the importance of site-specific field trials.

Implications

On January 25, 1996, Lester Brown, the President of Worldwatch Institute, reported that world carryover stocks of grain in 1996 have dropped to 48 days of world consumption, the lowest level on record. He also noted that within Europe, prices of barley, the leading food grain, have nearly doubled over the last year and that wheat has been trading in commodity futures markets at the highest level in 15 years. He concluded that restoring food security depends on investing more in agricultural research, soil conservation, cropland protection, water efficiency and other steps to expand food production (Brown, 1996).

The people-centered approach to development successfully used by World Neighbors and increasingly being advocated by development groups and agencies can play a vital role in helping improve food production for the one billion people whose livelihood depends on risky agricultural production. In the process, many of these forgotten small farmers will also be less at the mercy of shrinking government budgets and can become a significant force in helping to resolve social and economic problems of their nations (Bebbington, 1991).

Although it initially takes more time to begin where the people are and follow the seven steps in World Neighbors people-centered development methodology, participation of people in every step of the development process is vital for identifying, testing and disseminating new ideas. Indigenous languages are an asset, indeed a prerequisite, for the farmer-to-farmer extension system to be effective. And, as the capstone in this approach, the leadership training process which includes teaching farmers how to conduct small, site-specific field trials, enhances local pride and dignity, an essential motor of all sustainable development (Bunch & López, 1995) in areas that have no agricultural research or extension services.

References


LEARNING LOCAL KNOWLEDGE OF SOILS: IMPROVING LINKAGES BETWEEN LAND USERS AND EXTENSION PERSONNEL

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Outstanding Research Presentation

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Abstract

This paper describes and critiques the approach and methods I used to research local knowledge of soils and land management in two ecologies and cultures of West Africa. The anthropological approach chosen, the iterative methods developed, and the differences in their effectiveness in the two cultures are discussed. Semi-structured interviewing of groups and individuals, including visual and participatory aids, observing and participating in agricultural operations throughout the year were central to my approach and methods. Differences in knowledge by age and gender were studied, and extension activities noted. Applications for extension from what I learned are provided to help fill a need for literature on methods for extension personnel to learn local knowledge. Local extension efforts at soil conservation show how learning and working with local knowledge would have improved those efforts. The training of both extension administrators and field-level practitioners, in learning and working with local knowledge are considered.

This paper describes and critiques the approach and methods I used to research local knowledge of soils and land management in two ecologies and cultures of West Africa (Birmingham, 1996) and suggests applications for extension from what I learned. There is little published literature for extension personnel on methods for studying local knowledge. This scarcity is surprising given that the study of local knowledge is increasingly recognized in both international level research and extension discourse as necessary for effective development (National Research Council, 1991, 1992). If extension services are to become more effective, both extension administrators and field-level practitioners must be convinced of the need to work with local knowledge and be trained in how to learn from and work with it.

Studying local knowledge of soils is particularly imperative considering the criticality of soils to agriculture and rural livelihoods. The growing interest in local knowledge of soils is evidenced by the increasing numbers of related studies reported in the 1990s (Niemeijer, 1995). These studies largely focus on "indigenous soil classifications", or "ethnopedology", yet few provide detailed information on their methodologies.

My study is unique in its comparison of the local soil-land typologies and land management practices of two ethnic groups in two different ecosystems: the Bété in the equatorial forest...
zone and the Senufo in the guinea savanna zone, both in the West African country of Côte d’Ivoire (Ivory Coast) (Birmingham, 1996). Studying two cultures proved advantageous: the distinguishing features of each soil typology became more apparent through their contrasts and similarities, and the conclusions I drew about the effectiveness of certain approaches and methods were tempered by the often contrasting if not puzzling experiences in the other.

**Approach and Methods Used**

**Study Sites**

I chose two villages of the indigenous ethnic group in each of two agroecological zones where the West Africa Rice Development Association (WARDA), with whom I did this research, conducts village-level research and participates in an agroecological characterization of inland valleys in West Africa. Use of these sites allows use of the semi-detailed land characterization report (Windmeijer, Duivenbooden & Andriesse, 1994), and thus another interpretation of the land to compare with the local descriptions.

**Anthropological Approach**

I used an anthropological approach based on semi-structured interviewing, observing and participating in agricultural operations throughout the year. Introductions and interviews began during the dry season following harvest when villagers have fewer demands on their time. Group and individual interviews were held on days and at times most convenient for the participants desired. Separate interviews were held for men, for women, and for younger men in deference to village social structure. The separate interviews allowed me to study differences in knowledge and land use by gender and age, and the inter-generational transfer of knowledge. Interviews were conducted with different individuals until no new information on major topics was gained. About 250 semi-structured individual interviews were held with approximately 192 different people, with similar or representative numbers of men and women in each zone. More group interviews were held with the Bété than the Senufo, and more individual interviews with the Senufo than the Bété for reasons discussed later.

A local soil typology was elicited in each group meeting. Participants quite naturally suggested that someone show me these different soil types in the natural environment. Each soil type was repeatedly identified by different participants during the dry season at which time I took soil samples by auger. Soil samples were analyzed physically and chemically by WARDA so that quantitative measures could be compared within and between soil types, and with local qualitative descriptions. Individual interviews to study management practices were later held while walking with farmers to their plots and while in their fields. Not every interview asked the same questions, nor were interviews of the same length, depth, or breadth. Topics changed with the growing season, the activity encountered in the field, and the farmer's interests and availability. Current activities and impacts of extension activities on local knowledge in these villages were continuously observed as well as directly asked.

Soil mapping, soil ranking, and soil identification exercises done with groups and individuals were used to more deeply explore bases for local soil typologies. Methods were iterative and innovative according to varying situations and the different responses to methods experienced among social groups and especially among ethnic groups. I used serendipitous situations and sudden changes in interviewee availability as new opportunities rather than considering them losses. Having the opportunity to live in the forest zone villages of study furnished additional insights through impromptu interviews and conversations.

Semi-structured interviews of both groups and individuals were conducted in the local language. I hired a research assistant at each site to translate the local language into French and to
help with soil sampling. As my access points to local farmers, the assistants were crucial to data quality, and thus merit description. Each had some secondary education, had worked for WARDA and came well recommended. After a week's trial period, each assistant was hired for intermittent work with me over the year as I juggled visits between the forest and savanna zones. Samples of their recorded translations were examined by another person of their language group to verify accuracy. Quality of translation work needs to be constantly monitored. For example, Senufo were giving names of locations in addition to names of soil types. This only became evident after my assistants understood that they should interpret responses whether or not they felt the farmer understood the question or that the response was of use. Assistants read in French a field methods manual on rapid rural appraisal (Gueye & Schoonmaker Freudenberger, 1991) since the manual covered the value of local knowledge, semi-structured interviewing, and researcher attitudes as well as visual, participatory aids in interviewing such as maps, calendars, and diagrams, all of which were used in this research.

Interviews were audio-cassette recorded, with permission readily granted after I explained that I wanted to remember what the farmers were teaching me without taking more of their time to write it down. I reviewed cassettes daily with my assistant and made written notes, focusing on entering English paraphrases rather than French transcriptions. Extension personnel who speak the local language, or translate only to one language rather than two, will have an advantage in learning local knowledge.

I typed the notebook entries on to computer disks before leaving Côte d'Ivoire and analyzed them using HyperRESEARCH software. The software facilitates analysis of qualitative text-based data through computerized coding, retrieving, and manipulation of coded data. Interviews were coded according to name, gender, age category (young, middle-aged, or older adult), date, village, and ecological zone.

Using information on the Senufo noun class system and semantic analysis provided by missionaries who had worked among Senufo led to more fully understanding the Senufo soil/land typology. Linguistic variation is possible among Senufo villages that range from different pronunciations of the same words to mutually unintelligible languages between nearby villages.

Analysis of Approach and Methods

While very different soil typologies were elicited between the two ethnic groups (Birmingham, 1996), this paper continues to focus on my methods which often had different effectiveness in each culture.

Approach

Choosing an anthropological approach rather than a structured survey approach allowed me to more deeply understand the epistemology of local knowledge of soils and important causes for differences and changes in land-related knowledge, including attitudes. Iteratively interviewing and observing across the growing season facilitated deeper understanding of local soil typologies and land management. While the Senufo claimed only three soil types compared to the Bété's eleven, the Senufo have an intimate knowledge of soil variation evident through interviews during the growing season in their fields.

The use of semi-structured interviews gave villagers greater freedom in describing soils than a questionnaire or survey approach with structured response categories. Sometimes participants asked for prompting questions about the information specifically needed. The Bété more commonly made this request since a checklist helped them describe more efficiently and thoroughly their long list of soil types. This checklist evolved based on how soils were described in the earliest interviews: for example, color, how the soil feels, toposquence position, properties in the rainy season and the dry season, its uses. Common activities and experiences
were used, such as slipperiness underfoot or stickiness when hoeing to describe soil properties such as texture. Leaving the descriptions open-ended also facilitated seeing conceptual linkages between such aspects as vegetation, animals, organic matter, "soil fertility", and land quality. Greater Senufo esteem for their culture, including their "agriculture", was evident in the group work and the hoeing competitions of young Senufo men set to balafon and drum music. Never among the Bété did I witness such work in a group or as ritual. Such aspects of how labor is socially organized and performed, and how agriculture fits into larger cultural characteristics helped me understand both the epistemology of land-related knowledge and its inter-generational transfer. A survey approach would more likely miss these aspects, and in particular, the linkages between them.

Some of the best interviews were conducted while walking with a farmer to her or his field. They were the instructors, I was the pupil. As we walked, I observed and probed about landscape features and agricultural practices. Observations made in farmers' fields revealed relationships between what people said (theory) and what they did (practice), and illustrated practices and beliefs which either could not be readily described or which for certain individuals were more tacit rather than cognitive knowledge. The Bété, being more verbal and with higher levels of modern education, could better provide specific information than the Senufo whose knowledge seemed more tacit.

Questionnaires or more structured surveys can play a role when more specific or quantified information is needed, such as how widespread a particular practice is. For example, I developed a questionnaire for my assistant in the forest zone concerning the incidence of individual female plots by age and marital status, their motivations, and rituals pertaining to the land. He was encouraged to add questions he felt pertinent or interesting given the context.

**Timing**

Villagers appreciated that the group interviews were conducted during the dry season and on days of rest. The rapport built then yielded more openness to my interviewing during the rainy season. Group interviews were best done on regular days of rest, avoiding holidays, initiations, funerals, etc. Division of agricultural labor by gender, as for example land-clearing for Bété men and planting for Bété women, made men and women available at different times of the agricultural calendar. Appropriate scheduling yielded greater representation of those actively farming, as opposed to a dominance of people not physically active in agriculture for various reasons including old age, illness, physical handicap, lack of access to land, and occasional off-farm employment. Women had domestic responsibilities at specific times of the day, which were best respected.

**Group versus Individual Interviews**

Group interviews worked differently among the Bété and the Senufo. Culturally, the Bété were relatively easy to interview being an open and verbal people who readily adopt "western" ways, and some of whom speak French. Individuality is tolerated far more among the Bété than the Senufo where the group is more important. Often one person among the Bété was chosen as spokesperson, who either summarized the group's discussion, or originated and presented their long list of soils. Individuals, however, were free to augment the descriptions and evoke discussion. Group interviews furnished more complete and accurate information on all soil types than individual interviews. Because there were many soil types, an individual can easily forget one or two although he/she knows them. Group interactions livened the process making interviews less fatiguing and intense as the "work" was shared.

By contrast, the Senufo are reserved and adhere strongly to their cultural traditions. Their society exerts a strong influence to conform. Suspicious of outsiders, they were more difficult
to build rapport with and to interview, particularly the women. They generally did not like to meet in groups, a reluctance particularly apparent in one village and even experienced by a development worker who is himself Senufo. With the Senufo one person is the group’s spokesperson while others remain silent, even when I requested their participation. Consequently, while 20 group sessions were held with the Bété, only 9 were held with the Senufo. Partly because of this fact, and partly because the Senufo have more varied agricultural practices, more individual interviews were held with the Senufo.

Social Variables

Interviewing men, women, and young people separately allowed categorical differences in knowledge and practice by gender and age to surface. Men and women, in general, had more similar than dissimilar knowledges of soils in each culture despite different agricultural, domestic, and social roles for each gender. Depth of knowledge and, at times, the freedom to express knowledge was organized spatially, primarily through land tenure customs, the access to different land types, and one’s relationships to individuals connected with a certain land. Women were often reticent to speak up when older men, especially men of position, were present. Ease of sharing information varied by age and gender, especially among the Senufo.

Flexible and Creative Methods

Methods needed to be flexible, responsive, and creative to adapt to cultural preferences and village priorities, and to make optimal use of time. A few examples help illustrate. While waiting on a farmer to visit his fields, I interviewed several available senior men to learn about the Senufo calendar and seasonal activities. While Senufo women are quite reserved, I learned that they would open up if I asked about weeds since some had approached me with their most noxious weed in hand imploring me for a herbicide. Weed samples we collected for scientific identification were noted by villagers who gathered to verify if not supply further information on the weeds. Taking part in a woman’s field task, even using her hoe while she rested, helped build rapport.

In one instance, a respected elder described the different soil types so extensively that I asked if he could map them. He agreed, and a date was arranged when other elders could participate. The map was drawn on the ground at the chief’s compound and local materials used to designate different soil types and geographic features. However, an elder not familiar with my study objected that this information might be misused. After others subdued these complaints, rivalries erupted over land tenure and other issues. The map was eventually completed, but the experience also revealed that such exercises can evoke underlying issues and tensions. The surfacing of such issues is additional data that, while directly or indirectly related to the question posed, may prove insightful during the analysis and interpretation stages.

Land Tenure

Although land tenure is important to the local knowledge of soils, I did not address it directly because of the volatility of the issue in the forest zone and because of initial objections to my study in one Senufo village. Fearing that I might take their land or that my information might be used by others to do so, these Senufo villagers requested written proof of my research objectives, and acquiesced after I presented an official letter in French from my university chancellor's office. The sensitivity of information concerning the land was further evident in the general unwillingness of villagers to discuss or map another family's land. It also reveals the sense of privilege and import surrounding land information. The availability of information, therefore, should not be assumed by outsiders studying local knowledge.

Gifts and Compensation

Published studies on local knowledge have not
addressed compensation or gifts, but both should be considered. Villagers want to know and may ask what benefits they will accrue from a given research. After exploring the cultural norms and potential ramifications of giving gifts and/or compensation, I presented gifts to the village, with the chiefs, leaders, and other adults present, to express my appreciation and good will. Separate gifts, locally appropriate for men and for women that could be easily divided and distributed, were given in honor of the new year, an appropriate time to give gifts, and again at the conclusion of my work. It is also customary that younger adults provide elderly chiefs with small gifts, which I did as I returned periodically over the year of research. Sometimes I gave an individual just interviewed a token of appreciation—coins, cola nuts, aspirin, or sauce-flavoring cubes—which were easily on hand in my backpack and greatly appreciated.

Learning

How people learn was better observed than described through interviews. Learning in both cultures is highly socialized where children learn practical and social skills through their families, and in the Senufo culture, through *poro*, a structured indigenous form of education. Knowledge is experientially based in both cultures through individual experience and the experience shared by parents and elders. Agricultural knowledge begins in infancy as a child goes to the fields on its mother's back, and by watching, copying, and practicing. Several older Bété adults noted that their youth today only retain written information.

Implications for Extension

An overt hegemony of agricultural extension services still dominates in Senufo and Bété villages in Côte d'Ivoire. An example of an extension organization's efforts to conserve soil among the Senufo helps illustrate the value that first learning land-related local knowledge—including practices and perceptions—would have had in developing a more successful outreach.

The extension arm of the cotton parastatal, CIDT, began promoting soil conservation in one of the villages of study in 1994 by helping farmers install stone lines across the land contour and/or compost pits. Before the 1994 rains, the CIDT agent called a meeting in the village to present the need for stone lines and compost pits. According to him, few people participated and the measures were met with skepticism. It was quite surprising that no villagers ever mentioned this CIDT intervention even though I continually inquired about erosion and about extension or development efforts in their village. I learned of CIDT's efforts when visiting their office near completion of my research. Only two farmers installed the stone lines; none yet in composting. One is an older, wealthier man, while the other is a young man who trained as an electrician, but, unable to find urban employment, began farming in 1993. Both farmers were characterized by CIDT extension agents as "progressive". CIDT is rightly concerned about soil conservation since changes they instigated in farming leave these low-fertility, shallow soils of the savanna increasingly subject to erosion.

More dangerous, however, is the failure of farmers to perceive soil erosion as the significant problem it is, and the failure of CIDT to understand this perception. This research found that Senufo farmers are not concerned with the movement of soil itself. Rill and less commonly gully erosion were observed. The chief's wife, whose husband is the largest landowner in the village, when asked about the beginnings of a gully, seemed nonplused explaining that when they replace the soil it is washed away again, even though a rock a few meters away could have been used. What they are concerned about is the loss of fertilizers, seedlings, etc. in the soil. They are also aware that water carries weed seeds downslope, and thus shifts their plots from downslope up.

CIDT formulated not only the solutions but also the problem outside these villages, which they "injected" into them with little initial success. Extension personnel should have been assigned
to first study local knowledge related to soil conservation. This knowledge is crucial to developing an informed strategy and programmatic approach of reason to farmers. Extension personnel could have learned and then built on the significant local knowledge base regarding soil-water movement. Then they could have facilitated farmers' understanding that the erosion of soil is a problem and helped farmers recognize it in their fields. Importantly, extension personnel could discuss the actions certain farmers initiated to counter water movement. I noted a reputable senior man, a Senufo "champion cultivator" in his youth, had established his own anti-erosive measures. He used local materials, including stones, to block flows of water downslope through his plot. Such individuals will have more homophily with other farmers than presentations by extension personnel. Farmer efforts are local practices that, while not widespread, are homegrown solutions that should be affirmed, and improved and adapted where necessary. But extension personnel have to be with farmers in their fields to find these examples.

The timing is ripe to make changes in the theory and practice of extension services given their restructuring in Côte d'Ivoire. Farmers are certainly ready for change. Stated aims for the new system emphasize "farmer empowerment" and "farmer groups". Genuinely empowering farmers requires that their knowledge systems be not only acknowledged, but involved and built up in all extension activities.

Extension personnel must first learn to be attuned to local knowledge. This requires that they be educated to appreciate and accept alternative epistemologies, to understand the "situated" and multi-dimensional knowledge pertaining to land, soils and their management, and how knowledge is shaped by the biophysical realities and cultures of rural communities. In this learning process, extension personnel learn the strengths and weaknesses of local knowledge, as well as build the rapport necessary if they are to constructively contribute to local knowledge. Their attitudes and, furthermore, their job descriptions must change from transferring information and teaching farmers to working with farmers, understanding what farmers know, and how they know it.

There are no cookbook methods of how to learn local knowledge of soils. The following key elements though have largely been neglected in the primarily technical and information transfer approaches pervading training of extension personnel. Most important are these attitudinal aspects I just described, attitudes important at all levels of extension organization. Skills in semi-structured interviewing, observing, asking probing questions, and--perhaps most important-listening, must be part of the curriculum to prepare new extension personnel as well as the continuous education of those employed. Skills training must include less tangible qualities of flexibility and sensitivity. They must learn, accept and creatively adjust to agricultural and social demands on farmers, demands that may differ by gender, age, or other social variables. Farmers and extension personnel have time limitations that training can address to maximize participatory learning. Extension personnel need to understand concepts of "teachable moments" and "discovery learning" by encouraging, guiding, and further enabling farmers to experiment judiciously with new ideas.

For extension personnel at the field level to work directly with local knowledge and to interact meaningfully with both men and women farmers of varying ages requires organizational structure, incentive, and training. Extension personnel at all levels should be required to be in farmers' fields periodically. To do so, they must be equipped and motivated to become "learning" agents with farmers in their fields rather than just "extension" agents who extend information at farmers from the sidelines.

**Conclusion**

Improving linkages between extension services and the rural communities they serve entails training extension personnel in the need for and
the methods of learning and working with local knowledge. My own methods were described and critiqued in this paper to help provide needed literature regarding the important recovery of local knowledge concerning soils. An example of an extension organization's efforts at soil conservation was critiqued. It is not the intent that field extension workers alone be educated and trained in the value and recovery of local knowledge but that those at administrative and supervisory levels are as well, so that the extension service as a whole is working to learn, utilize, and strengthen local knowledge. Then alone will true linkages be fostered and deepened between those whose rural livelihoods come from the land, and those whose job it is to improve those livelihoods as well as sustain the land resources involved.

References


AGRICULTURAL EXTENSION ISSUES: PERCEPTIONS OF BANGLADESH T&V EXTENSION PERSONNEL

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Abstract

This study investigated the perceptions of T&V Extension staff in Bangladesh concerning agricultural extension issues. Three-hundred and thirteen block supervisors, 54 Thana level officers, and 34 extension administrators of the Bangladesh Department of Agricultural Extension participated in the study. Forty agricultural extension issues in nine categories were explored. Thirty-six issues were considered serious. Some of the more serious issues were timely availability of production inputs; not enough vehicles for block supervisors; resources for applying technologies not available; capacity for disseminating technology to the intended audience; flow of information from research to extension; lack of performance appraisals for block supervisors; lack of periodic training; and frequent transfers of block supervisors. Dissimilarity between the perceptions of the three groups of personnel was noted on issues of farmers believing block supervisors lacked technical training; too few training institutions; block supervisors lacked periodic training; performance appraisals lacking for block supervisors; and frequent transfers of block supervisors. The study highlights significant challenges facing agricultural extension in Bangladesh. Continued improvement of communication links among the three levels of the extension system is necessary to meet these challenges.

Following World War II numerous formal agricultural extension services were established as countries gained their independence from colonial powers (Swanson & Claar, 1984). Agricultural growth was viewed as critical if development was to occur in these emerging nations (Allo & Schwass, 1982). By the 1980s extension services worldwide reached a "critical turning point" (Rivera, 1991, p. 3). This was due, in part, to concern regarding the effectiveness of agricultural extension projects as related to total expenditures (Ameur, 1994).

A review and synthesis of literature dealing with extension problems in Africa and Asia (Ukaga, Radhakrishna & Yoder, 1994) noted numerous constraints that limit the effectiveness of international agricultural extension programs. Sigman and Swanson (1984) previously identified eight problems or constraints for the effective implementation of international agricultural extension programs. Ukaga et al. (1994) drew on a further cross-section of other studies with similar foci, notably Allo & Schwass (1982), Rogers (1983), and Mosher (1978), in identifying and discussing common constraints for international extension programs. The problems identified were appropriate technology, linkage between research and extension, technical training, extension training,
organization, coordination, mobility, equipment, and teaching aids.

Bangladesh is among the countries where similar constraints have been observed (Halim, 1991; Karim & Mahboob, 1991; Kashem, 1992; Kashem & Halim, 1991; Obaidullah & Mannan, 1993). In 1977 the T&V System of agricultural extension was introduced in Bangladesh with the assistance of the World Bank (Kashem, 1992). Although the T&V System was designed to correct problems in previous extension systems by addressing the constraints noted previously, recent studies have questioned its efficiency and effectiveness (Kashem, 1992).

The Department of Agricultural Extension (DAE) employs almost 24,000 people, 12,000 of whom are Block Supervisors (BS), or village extension workers (VEW), as they are generally known in T&V Systems (Halim, 1991). As stipulated by DAE guidelines, each block supervisor is responsible for providing agricultural extension services to approximately 1,500 farm families (DAE, 1993b). The activities of block supervisors are supervised at the Thana (county) level by the Thana Agriculture Officer (TAO) and Subject Matter Officers (SMO). TAOs and SMOs are equivalent to the traditional T&V designations of Agricultural Extension Officer (AEO) and Subject Matter Specialist (SMS), identified by Benor and Baxter (1984).

Studies of the T&V System in Bangladesh (DAE, 1993a, 1993b; Halim, 1991; Karim & Mahboob, 1991; Kashem, 1992; Kashem & Halim, 1991; Obaidullah & Mannan, 1993) have cited problems with (a) poor linkages between research and extension, (b) the extension of new technologies that are not suited to farmers’ conditions, (c) recommended technologies not being demonstrated, (d) block supervisors’ competency as information providers being limited, (e) contact farmers failing to disseminate information to other farmers, (f) the emphasis on individual farmer contact leading to poor contact with women and small or landless farmers, and (g) poor administrative organization and lack of coordination between related organizations.

Although numerous studies have cited problems with the T&V System in Bangladesh, no published studies have specifically examined the perceptions of personnel at various levels of the extension service regarding issues facing extension in Bangladesh. As Patton (1983) noted "many rigorously designed evaluations go unused because evaluators failed to find out what program staff and decision makers really needed and wanted to know" (p. 15).

**Purpose and Objectives**

The purpose of the study was to examine the perceptions of block supervisors (field level extension workers), extension staff at the Thana (county) level (Thana Agricultural Officers and/or Subject Matter Officers), and upper-level staff of the DAE (directors, regional directors, and deputy directors), on issues facing agricultural extension in Bangladesh.

The objectives of the study were to:

1. Identify the most serious agricultural extension issues in Bangladesh as perceived collectively by extension employees at the three levels of the extension service.
2. Compare perceptions of extension employees among the three levels of the extension service regarding the seriousness of agricultural extension issues in Bangladesh.

**Procedures**

**Population and Sample**

The population consisted of 12,640 block supervisors, 2,306 Thana officers (Thana Agricultural Officers and/or Subject Matter Officers) and 80 DAE administrators (directors, regional directors, and deputy directors) in Bangladesh (DAE, 1994; Kashem, 1992). A Thana-based random sample of block supervisors (470) in 18 randomly selected
Thanas was identified. In addition, 85 Thana officers, and 55 upper-level DAE administrators were selected.

**Instrumentation**

The researchers utilized a research instrument developed by Radhakrishna & Bowen (1991) for use in India. The instrument was reviewed for content and face validity by three researchers and faculty members from International University of Business, Agriculture, and Technology, Dhaka, Bangladesh. Following this review, the instrument was modified slightly to reflect programmatic differences between the T&V System in Bangladesh and India, including the use of different personnel designations. The instrument was translated into Bangla, the national language of Bangladesh, and then reviewed again to ensure accuracy. The instrument included 40 questions related to the nine common constraint areas for international agricultural extension identified by Ukaga (1994). Responses were recorded on a three-point Likert scale: 1 (a serious issue); 2 (somewhat of an issue); 3 (not an issue). Demographic data on age, gender, marital status, highest level of education, length of service with the DAE, and annual salary were also collected.

**Data Collection and Analysis**

Questionnaires were mailed by the DAE to Thana offices and then distributed by Thana officers to block supervisors according to the pre-study agreement established with the DAE. A cover letter in Bangla explaining the purpose of the study and a self-addressed pre-paid return envelope were included with each questionnaire. Similar materials were mailed to DAE administrators. Due to a restriction on conducting subsequent mailings stipulated by the Director General of the DAE, only one mailing was done. After six weeks the returns were as follows: block supervisors 313 (66%); Thana officers 85 (63%); and extension administrators 34 (42%). In addition, due to limitations associated with the Bangladeshi mail service, notably differential times of return, no attempt was made to compare early and late responses or to conduct subsequent mailings to increase response rates.

The data were analyzed using descriptive statistics. Serious extension issues were defined as those issues having means of 1.5 or less; somewhat serious issues as those with means greater than 1.5 and less than 2.5.

The study findings are descriptive of the sample and are not generalizable to the population.

**Findings**

**Perceptions of Agricultural Extension Issues**

The following were identified collectively by personnel in the three levels of the extension service as the most serious agricultural extension issues in Bangladesh. Due to space limitation, only those issues with total means less than or equal to 1.3 are listed. However, the data on all issues are shown in Table 1.

- timely availability of production inputs (mean=1.1)
- not enough vehicles for block supervisors (mean=1.1)
- resources for applying technologies not available (mean=1.2)
- capacity for disseminating technology to the intended audience (mean =1.2)
- flow of information from research to extension (mean=1.2)
- lack of extension equipment (mean=1.2)
- block supervisors lacking offices (mean=1.2)
- unavailability of equipment such as visual aids, camera, projector, etc. (mean=1.2)
- block supervisors at the village level not having an office (mean=1.2)
- office stationery not available to block supervisors (mean=1.2)
- lack of performance appraisals for block supervisors (mean=1.2)
• inadequate housing facilities for block supervisors (mean=1.3)
• lack of periodic training (mean=1.3)
• frequent transfers of block supervisors (mean=1.3)

Only one issue had a total mean greater than 2.5, indicating that it was not an extension issue.

Table 1.
Mean, Median, and Standard Deviation for Block Supervisors’, Thana Officers’ and Extension Administrators’ Perceptions Regarding Agricultural Extension Issues in Bangladesh.

<table>
<thead>
<tr>
<th>Agricultural Extension Issue</th>
<th>Block Supervisors</th>
<th>Thana Officers</th>
<th>Extension Admin.</th>
<th>Total Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technology Acceptance</strong></td>
<td>Mean</td>
<td>Mdn</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>Timely availability of technological inputs such as fertilizers, improved seeds, plant protection chemicals, etc.</td>
<td>1.1</td>
<td>1.0</td>
<td>0.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Resources for applying technologies not available.</td>
<td>1.2</td>
<td>1.0</td>
<td>0.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Assimilation of appropriate technology by farmers.</td>
<td>1.6</td>
<td>2.0</td>
<td>0.6</td>
<td>1.4</td>
</tr>
<tr>
<td>New technology conflicting with traditions and practices.</td>
<td>1.9</td>
<td>2.0</td>
<td>0.5</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Linkage</strong></td>
<td>Mean</td>
<td>Mdn</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>Flow of information from research to the extension service.</td>
<td>1.2</td>
<td>1.0</td>
<td>0.4</td>
<td>1.3</td>
</tr>
<tr>
<td>Lack of contact between extension staff and research staff located in major towns and cities.</td>
<td>1.6</td>
<td>1.0</td>
<td>0.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Lack of emphasis on research related to rainfed (non-irrigated) farming.</td>
<td>1.8</td>
<td>2.0</td>
<td>0.7</td>
<td>1.8</td>
</tr>
<tr>
<td>Research priorities do not match the needs of farmers.</td>
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<td>2.0</td>
<td>0.8</td>
<td>2.0</td>
</tr>
<tr>
<td>A gap existing between research and extension because the research staff are better paid.</td>
<td>1.9</td>
<td>2.0</td>
<td>0.8</td>
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<td>A gap existing between research and extension because the research staff are more qualified.</td>
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</tbody>
</table>
Table 1. (Continued).

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<tr>
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<th>Thana Officers</th>
<th>Extension Admin.</th>
<th>Total Mean</th>
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<tr>
<td><strong>Technical Training</strong></td>
<td></td>
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<tr>
<td>Lack of periodic training to update block supervisors.</td>
<td>1.2 1.0 0.4</td>
<td>1.3 1.0 0.6</td>
<td>1.8 2.0 0.7</td>
<td>1.3</td>
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<td>Too few institutions to train block supervisors.</td>
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<td>1.9 2.0 0.9</td>
<td>2.1 2.0 0.8</td>
<td>1.6</td>
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<td>A gap exists between what is taught in training institutions to what is required of block supervisors.</td>
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<td>1.9 2.0 0.6</td>
<td>2.0 2.0 0.7</td>
<td>1.9</td>
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<td>Farmers perceptions that block supervisors lack technical training.</td>
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<td>2.1 2.0 0.8</td>
<td>2.0 2.0 0.6</td>
<td>2.2</td>
</tr>
<tr>
<td>Block supervisors lack the subject matter, knowledge, and skills farmers need.</td>
<td>2.4 3.0 0.7</td>
<td>2.0 2.0 0.8</td>
<td>1.8 2.0 0.7</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Coordination</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of coordination between extension and other government services.</td>
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<td>1.8 2.0 0.7</td>
<td>1.9 2.0 0.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Too much centralization in the Ministry of Agriculture resulting in poor coordination.</td>
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<td>1.8 2.0 0.7</td>
<td>1.9 2.0 0.8</td>
<td>1.8</td>
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<tr>
<td>Extension programs failing due to poor coordination.</td>
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<td>1.8 2.0 0.7</td>
<td>1.7 2.0 0.7</td>
<td>1.8</td>
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<tr>
<td><strong>Extension Training</strong></td>
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<td></td>
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<tr>
<td>Capacity for disseminating technology to the intended audience.</td>
<td>1.1 1.0 0.5</td>
<td>1.2 1.0 0.4</td>
<td>1.4 1.0 0.6</td>
<td>1.2</td>
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<td>Modern communication methods not used because of low literacy level of farmers.</td>
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<td>1.4 1.0 0.5</td>
<td>1.4 1.0 0.4</td>
<td>1.5</td>
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<td>Block supervisors’ understanding of the communications media.</td>
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<td>1.8 2.0 0.7</td>
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<td>1.7</td>
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<td>Block supervisors are not adequately trained to use communications media.</td>
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<td>1.8 2.0 0.7</td>
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<td>2.3 2.5 0.7</td>
<td>2.7 3.0 0.5</td>
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<td><strong>Organization</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Lacking performance appraisal of block supervisors.</td>
<td>1.1 1.0 0.4</td>
<td>1.5 1.0 0.7</td>
<td>1.6 2.0 0.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Frequent transfers of block supervisors hampering extension work.</td>
<td>1.1 1.0 0.4</td>
<td>1.7 1.0 0.8</td>
<td>2.5 3.0 0.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Too much centralization in the Ministry of Agriculture resulting in field staff feeling a lack of input and ownership.</td>
<td>1.9 2.0 0.8</td>
<td>1.6 2.0 0.7</td>
<td>1.8 2.0 0.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Block supervisors performing duties other than advisory work.</td>
<td>1.9 2.0 0.8</td>
<td>2.2 2.0 0.7</td>
<td>2.2 2.0 0.7</td>
<td>2.0</td>
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<tr>
<td>Lack of clear job responsibilities for block supervisors.</td>
<td>1.9 2.0 0.9</td>
<td>2.0 2.0 0.9</td>
<td>2.2 2.0 0.7</td>
<td>2.0</td>
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</tbody>
</table>
Table 1. (Continued).

<table>
<thead>
<tr>
<th>Agricultural Extension Issue</th>
<th>Block Supervisors</th>
<th>Thana Officers</th>
<th>Extension Admin.</th>
<th>Total Mean</th>
</tr>
</thead>
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<tr>
<td></td>
<td>Mean</td>
<td>Mdn</td>
<td>S.D.</td>
<td>Mean</td>
</tr>
<tr>
<td>Mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not enough vehicles for block supervisors.</td>
<td>1.1</td>
<td>1.0</td>
<td>0.2</td>
<td>1.3</td>
</tr>
<tr>
<td>Low budget allocation for transport.</td>
<td>1.3</td>
<td>1.0</td>
<td>0.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Fuel and maintenance costs of vehicles.</td>
<td>1.8</td>
<td>2.0</td>
<td>0.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Conditions of roads prohibit extension workers from having a vehicle.</td>
<td>2.5</td>
<td>3.0</td>
<td>0.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Misuse of government vehicles by extension staff.</td>
<td>2.8</td>
<td>3.0</td>
<td>0.5</td>
<td>2.6</td>
</tr>
<tr>
<td>Equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unavailability of equipment such as visual aids, camera, projector, etc.</td>
<td>1.2</td>
<td>1.0</td>
<td>0.5</td>
<td>1.3</td>
</tr>
<tr>
<td>Block supervisors at the village level not having an office.</td>
<td>1.2</td>
<td>1.0</td>
<td>0.6</td>
<td>1.2</td>
</tr>
<tr>
<td>Office stationery not available to block supervisors.</td>
<td>1.1</td>
<td>1.0</td>
<td>0.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Inadequate housing facilities for block supervisors.</td>
<td>1.3</td>
<td>1.0</td>
<td>0.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Teaching Aids</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of teaching aids such as blackboard and chalk.</td>
<td>1.5</td>
<td>1.0</td>
<td>0.6</td>
<td>1.7</td>
</tr>
<tr>
<td>Lack of teaching aids such as posters.</td>
<td>1.6</td>
<td>1.0</td>
<td>0.6</td>
<td>1.7</td>
</tr>
<tr>
<td>Lack of teaching aids such as flip charts.</td>
<td>1.6</td>
<td>2.0</td>
<td>0.7</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Comparisons of Perceptions of Agricultural Extension Issues among Extension Personnel

The agricultural extension issues addressed in this section were selected due to the marked dissimilarity observed among the responses of the three personnel groups. Less dissimilarity was observed for the remaining issues (Table 1).

As indicated in Figure 1, the percentage of respondents indicating farmers believed that block supervisors lacked technical training was a very serious issue was relatively uniform among the three groups surveyed. Responses varied from a high of 26% for Thana Officers to 18% for extension administrators. The percentage of respondents indicating the issue was somewhat serious, however, varied substantially among the three groups. Only 20% of block supervisors indicated that farmers' perceptions of their training was somewhat of an issue; compared with 64% of extension administrators and 39% of Thana officers. Therefore, 82% of extension administrators and 65% of Thana officers indicated that the farmers' lack of confidence in block supervisors' technical training was an issue. In contrast, 54% of block supervisors indicated this was not an issue.
When asked whether block supervisors lack the knowledge and skills farmers need, 35% of extension administrators indicated that this was a very serious issue, while 50% indicated that it was somewhat of an issue (Figure 2). In contrast, only 13% of block supervisors indicated that their lack of knowledge and skills was a very serious issue, while 52% responded that it was not a problem. Thana officers' responses were evenly distributed among the three response categories.

One-half of the block supervisors (50%) indicated the lack of institutions providing training for block supervisors was a very serious issue (Figure 3). Another 45% indicated that it was a somewhat serious issue. In contrast, 42% of Thana Officers and 27% of extension administrators indicated that the lack of training institutions for block supervisors was a very serious issue. One-third of Thana officers and one-third of extension administrators indicated that the lack of training institutions for block supervisors was not an issue; whereas, only 5% of block supervisors responded in the same manner.

The majority of block supervisors (83%) and Thana officers (71%) responded that the lack of periodic training for block supervisors was a very serious issue (Figure 4). Extension administrators were divided in their opinions, with 41% indicating that the lack of periodic training was a very serious issue, and another 41% that it was a somewhat serious issue.

As indicated in Figure 5, 90% of block supervisors responded that the lack of performance appraisals for block supervisors was a very serious issue; whereas only 65% of Thana officers and 47% of extension administrators responded similarly. Another 21% of Thana officers and 45% of extension administrators indicated that the lack of performance appraisals was somewhat of an issue.

In response to whether the frequent transfer of block supervisors hampered extension work, 89% of block supervisors indicated that this was a very serious issue, and only 3% indicated that this was not an issue (Figure 6). In contrast, only 12% of extension administrators indicated that the frequent transfer of block supervisors hampered extension work and was a very serious issue, while approximately two-thirds of them (62%) indicated this was not an issue. However, the majority of Thana officers (76%) indicated that the frequent transfer of block supervisors was an issue.
Conclusions and Implications

The selected findings presented in this paper identify numerous issues facing agricultural extension in Bangladesh. Although the discussion in this paper has been primarily limited to issues that were identified as being very serious, or issues where the three groups perceived their seriousness differently, it is important to note that with the exception of five issues, the combined mean scores of issues were less than 2.0. Moreover, relatively few individual group mean scores were greater than 2.0. This clearly indicates that the government extension service in Bangladesh is facing significant challenges as it attempts to more effectively meet the needs of farmers. On a similar note, the DAE reported that the T&V System in Bangladesh has "not been particularly successful" (DAE, 1993a, p. 1). Of the issues perceived to be serious, the majority are related to the development of a strong extension infrastructure, a problem commonly encountered in developing countries (Ukaga et al., 1994).

The findings reveal Thana officers and extension administrators are generally less confident in the ability of block supervisors to effectively convey information to farmers than are block supervisors themselves. The dissimilarity among responses of block supervisors, Thana officers, and extension administrators suggests there may be significant implications for program planning, particularly in the area of developing appropriate training and supervisory strategies for block supervisors. It should be understood that no attempt was made to assess the general effectiveness of block supervisors as agricultural extension workers on the basis of this survey.

Although block supervisors were generally more confident regarding their ability to effectively convey information to farmers, the relatively high variance observed in block supervisors' responses regarding their own knowledge indicates this is also an issue requiring further study. Relationships between educational level, length of service, and geographical area of service should be considered in future research, as possible factors contributing to the variance observed in block supervisors' responses.

Block supervisors, almost without exception, indicated both the lack of training institutions and lack of periodic training are extension issues in Bangladesh. The percentage of block supervisors responding that the lack of periodic training is a very serious issue is notable, particularly in light of block supervisors generally favorable opinion of their own technical skills. Further study is required for conclusions to be made regarding block supervisors need for periodic training.

Within the category of organization, the lack of performance appraisals and frequent transfers were identified by block supervisors as being very serious issues. The similarity of Thana officers' responses reinforce the need for further inquiry. Other issues that warrant further attention include the mobility of block supervisors and the availability of equipment required for block supervisors to be effective extension agents.

The findings of this study highlight the significant challenges facing the government extension service in Bangladesh as it attempts to develop more effective extension linkages-challenges that are indicated by the low mean scores for specific issues reported in this study. In addition, particular challenges are evident when the dissimilarities among the responses provided by block supervisors, Thana officers, and extension administrators are considered. The lack of consensus among extension professionals reported in this study on critical issues such as training needs, personnel appraisal, and personnel transfer, represents a formidable obstacle for effecting positive change within the Bangladesh extension service. Improved communication linkages between the main levels of the extension service will be necessary if these specific issues of concern are to be addressed. The Department of Agricultural Extension has recognized that
without improved communication, the likelihood of future program decisions not corresponding with the perceived needs of extension personnel is high (DAE, 1993a; 1993b). Recent attempts by the DAE to decentralize agricultural extension in Bangladesh may indicate a positive move in this direction.

As recognized by the World Bank (Ameur, 1994), there is a need for a decentralizing of the mission of agricultural extension worldwide. Furthermore, it has been recognized that the T&V System is among the extension systems where decentralization must occur. The findings presented in this paper provide an opportunity for examining the challenges facing extension educators in Bangladesh and for facilitating dialogue among extension personnel in Bangladesh and among individuals in similar historically centralized extension systems as they search for linkages for the future.

References


COMMENTARY

Commentary is a new section of articles in the Journal beginning with this issue of Volume 3. In commentary articles, authors can express opinions, offer challenges, present thought-provoking ideas on issues in our field.

Dr. William Rivera was invited to give his views on the shifts occurring in public sector agricultural extension funding and delivery systems. Dr. Rivera who has studied and written extensively on this subject posits that the decentralization reshaping extension around the world is gaining ground and will likely endure in the future. His contribution to this important subject is appreciated. Readers’ comments on his commentary and/or individual contributions as commentary articles submitted to the Journal are welcome. Editor.

REINVENTING AGRICULTURAL EXTENSION:
FISCAL SYSTEM REFORM, DECENTRALIZATION, AND PRIVATIZATION

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Public sector reforms of agricultural extension funding and delivery systems have been taking place on a global basis since the mid-1980s as a result of severe attacks on public sector extension systems (Rivera & Gustafson, 1991). The over-extendedness of public sector extension, the present scarcities of financial resources for extension and, in some cases, lack of skilled manpower and dearth of organizational capacity have led to major changes in ideological, economic and technical perspectives of agricultural extension. The changes and challenges affecting extension are symptomatic of wider forces at work in society. Indeed, extension trends appear to be reflective of polity trends noted by Hambleton (1992), namely (a) the "dismantled state" wherein the "third sector" dominates, public service ethos is prevalent, the major modus operandi is contracting with non-profit organizations, and people are treated as customers and citizens, and (c) the "decentralized state" wherein the public sector dominates, public-service ethos is prevalent, the major modus operandi is contracting with devolved units, and people are treated as consumers. These polity trends help to place extension within the larger context of public sector development. An analysis of extension suggests that reforms are likely to result in overlapping rather than single approaches, at least in some cases.

Three types of extension reform stand out: fiscal redesign, structural and managerial decentralization, and privatization. These
reform measures may be considered as decentralization strategies. Fiscal system reform strategies and practices involve different measures for paying for the delivery of agricultural information and extension. Decentralization reform includes both structural and managerial changes in extension, such as (a) deconcentration to field offices, (b) deconcentration of a dual (government/farmer) nature, (c) devolution to subgovernment (regional, province, state, county, etc.), and (d) pluralistic sharing of authority at the local level. Privatization, the extreme form of decentralization, refers to strategies for full or partial transfer of responsibility for funding and delivery of agricultural extension to farmers' organizations or other private entity, including non-government, voluntary organizations.

**Fiscal System Redesign**

The most pervasive fiscal system redesign for financing extension is direct charging. Direct charging for extension services is increasing, especially in Organization of Economic Cooperation and Development (OECD) member countries, largely because of national deficits that have resulted in changes in government policy and consequent reorganization of agricultural advisory services. Over one-half of the OECD member countries currently receive at least 20% of their finances from direct charging, and two, Finland and Norway, receive more than 50% from users. Extension services tend to be sold with few exceptions to users at a nationally-determined price; however, in some cases, highly individualized projects command higher prices, and projects for low-income users are offered at reduced prices (OECD, 1992). Some countries offer discounts, give subsidies or otherwise encourage emerging and low-income farmers to engage in group use of services which is less expensive than one-on-one service (OECD, 1992).

Other than Belgium and Japan where the government fully finances agricultural advisory services, there has been a downward trend in the relative share of government support since 1970. In some countries, this decline has been significant while in others it was barely perceptible. By 1990, 11 of the 14 countries still received well over half their funds from the government. Only Denmark, France and Finland receive most of their finances from non-governmental sources. However, eight of the agricultural advisory services in 1990 received some support from sources other than the government.

In OECD member countries long-term declines in farm numbers and farm employment mean that agriculture contributes much less to national gross domestic product than it did just a few years ago, and certainly much less than it did 20-30 years ago. Governments continue to support agricultural advisory services, but their share of financial contribution is declining. Almost all services are sold to users at a nationally-determined price, although sometimes highly individualized projects command prices while projects for low-income users are offered at reduced prices. User fees is the most prevalent method of collection; other methods include subscriptions and individual contracts (OECD, 1992).

A distinct strategy for recovering costs, implemented by New Zealand, is commercialization, whereby the government agency originally responsible for extension is instructed to assume a private sector/contractual relationship with its users. This change from providing a free public service financed by government to a commercial operation financed by user charges is a strategy that has gained increasing attention in recent years.

In some cases, as in Chile, central governments have opted to continue to bear the costs of extension, but have developed voucher schemes whereby the government assumes the costs but shifts responsibility for delivery to the private sector, with the intention of initiating a cost-recovery system at a later date. Voucher schemes provide small farmers with coupons, or vouchers, which serve as tender for them to command the services of private agricultural
extension consultants. Chile adopted an extension voucher scheme early on and Costa Rica more recently.

Decentralizing through Structural and Managerial Reform

Governments have adopted various strategies for structurally and managerially decentralizing extension. Structural strategies include deconcentration, devolution, and delegation, as well as transfer of responsibility to the private sector (Rondinelli, 1987). Managerial decentralization generally involves greater participation by users in program planning and management.

Deconcentration is defined as the transfer of effective control by central agencies to their field level offices. Authority for extension may be deconcentrated in a number of ways: through financial grants, local coordination, district administration, provincial development planning and regional coordination. Such deconcentrated disbursement schemes prevail in the extension services of Belgium, England and Wales, Indonesia, and Ireland.

In a dual authority structure, as in Taiwan and South Korea, authority is shared by government and farmer associations. In some cases this type of structural arrangement shifts authority entirely to cooperatives or chambres of agriculture, as in Denmark, Finland and France.

Devolution means that effective control is transferred to subnational governments. Authority for extension may be shifted in part or entirely to state or local governments which then become the final arbiters of fiscal and management decisions for extension. Colombia and Costa Rica are examples of a devolved system.

Delegation takes place when a subnational government or parastatal acts as the agent of the central government in the implementation of agricultural extension functions. Some countries simply delegate responsibility to a parastatal or other entity. The French Textile Company, Compagnie française pour le développement des fibres textiles, operates as a parastatal in some 21 countries, under various names and for varied agricultural development purposes (Mahdavi, 1985).

While often associated with decentralization, strategies for the transfer of authority to the private sector include shifting services to NGOs, cooperatives and community organizations.

Central to the rationale for decentralizing extension is the argument for farmers' participation and the greater use of local expertise for program development. The extension function is not merely to transfer technology but to ensure effective two-way flow of information, with the aim of empowering farmers through knowledge rather than issuing technical prescriptions (Antholt, 1991). Advantages of using local expertise are capacity building, cost effectiveness, and greater familiarity with the local context (Zijp, 1994).

Participatory decision making in extension has been shown to increase commitment to the programs associated with extension systems (Lionberger & Chang, 1981). By getting closer to the users, a decentralized system may develop superior information channels, foster greater equity, and improve management and resource allocation decisions. One way of conceptualizing participation, commitment and empowerment of individuals/communities is illustrated below.

Decentralization is not new to extension. In some countries extension is historically decentralized, and devolved authority has long existed; examples are Brazil, Canada, Germany, India and the United States. In these federally constituted countries agricultural extension like other public sector services has not only tended to be historically decentralized, but "fiscal federalism" (Shah, 1994) prevails.

Privatization
The most radical means of paying for and delivering extension is to shift the burden of cost recovery to private companies. The Netherlands decided in the early 1990s to privatize one half of its public extension agents by transferring them with initial financial support to work with farmer associations, while the other half were assigned regulatory tasks, primarily to oversee the use of agricultural chemicals. More recently, The Netherlands has shifted all authority for extension to a private company, the DLV.

It should be remembered that even before the restructuring emphasis of the mid-1980s, public sector extension structures varied considerably (Blanckenberg, 1984), and except for the strictly central authority structure, involved some form or degree of decentralization. Nevertheless, the various fiscal system reforms, decentralization determinations, and privatization arrangements described herein represent important current thrusts to reform agricultural extension systems in developing, as well as in industrialized, countries.

<table>
<thead>
<tr>
<th>The Individual/Community</th>
<th>Farmers are informed</th>
<th>Farmers are consulted</th>
<th>Farmers participate</th>
<th>Farmers make decisions</th>
<th>Farmers take responsibility; initiate action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Traditional top-down approach. Objectives imposed by outside groups.</td>
<td>Input sought, but may not influence final decisions.</td>
<td>Participation sought to improve program relevance and outcomes</td>
<td>Decide to participate (or not), and prioritize use of resources</td>
<td>Plan, implement and manage program, and take responsibility for outcomes.</td>
</tr>
<tr>
<td>Stages</td>
<td>Participation</td>
<td>Commitment</td>
<td>Empowerment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Participation | Commitment | Empowerment |

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References


TOOLS OF THE PROFESSION

Book Review


John Campbell contends in Reclaiming a Lost Heritage that land-grant colleges and universities face great challenges in the twenty-first century and must set upon a course of visionary action to achieve excellence in the coming decades. In this comprehensive work Campbell reviews the legacy of the land-grant system, ponders current trends in higher learning institutions and explores options to revitalize higher education. Himself a product of the land-grant system, the author has written an excellent text for those concerned with the survival of land-grant colleges and universities in the twenty-first century. Going beyond analysis of current problems within the land-grant system, he proposes solutions for aggressively addressing the current decline in support for higher education. The commitment to a democratized higher education system is evident in this book.

Campbell examines the perceptions of the public regarding higher education and proposes that one of the greatest challenges facing those involved in higher education is regaining public trust. He attributes the loss of funding universities are currently experiencing to this loss of trust. Campbell calls for university leaders to redesign the land-grant system with an emphasis on accountability and controlling costs. Initiatives vitally important to the progressive development of higher education include multi-cultural diversity, technology transfer, telecommunication and distance learning.

Arguing that America's human diversity is our country's greatest strength, Campbell entreats academic leaders to ensure that our campuses are places where gender, race and ethnicity make no difference. Those involved in higher education must commit themselves to ensuring that all Americans are fully represented in our institutions of higher learning.

Transferring technological discoveries from institutes of higher learning to industry is viewed as critical to sustained economic growth for our country and the world. Campbell proposes that universities adopt liberal institutional patent policies. This could be a solution to encourage commercialization of the results of university research.

Because of monumental changes in technology in recent years, institutions of higher education will be forced to incorporate the tools of technology into strategic plans to deliver a quality, accessible, low-cost education to students or be left behind. Due to the increasing competition in education, higher education institutions must utilize communication advances to increase its ability to attract students. The use of distance learning strategies can extend the reach and increase the accessibility of the higher education experience.

Campbell contends that higher education must re-dedicate itself to the three-fold mission of land-grant universities: teaching, research and service. He admits that achieving a delicate balance of these three missions is an immense task, yet thinks it is essential for positioning the institutions to achieve excellence in the future.

The Cooperative Extension Service is lauded by Campbell as one of the greatest achievements of the land-grant legacy. He suggests that while many foretell doom in regard to the universities'
public service mission, increased public support could result if land-grant universities determine and respond to public needs.

Other land-grant initiatives covered in the book are international, agricultural and food sciences, the dynamics of change and financing. The last two chapters deal with the future of land-grant institutions, and a suggested plan and call for action. The author encourages all stakeholders of higher education to review and augment the ideas, concepts and suggestions he presents.

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The challenges set forth in this excellent analysis of the land-grant system includes a body of recommendations from which much positive dialogue, debate and even action can stem. **Reclaiming a Lost Heritage** is an excellent guide on revitalizing the land-grant system, and should have broad appeal for policy makers, educators, researchers and extension workers worldwide.
Book Review


Management in Extension, as in any other business, is a never-ending study. The authors give an excellent overview of the concepts, theories, principles and practices that need to be considered to successfully administer Extension programs.

The authors deal with management in seven parts: Part One - Understanding Management, deals with the various functions of management; Part Two - Planning discusses the planning function of management; Part Three - Organizing takes the reader through a discussion of how to organize resources to accomplish objectives; Part Four - Staffing and Human Resource Management covers various aspects of personnel management such as recruiting, selection, and equal employment opportunity; Part Five - Leading and Influencing discusses the interpersonal aspects of the manager's job; Part 6 - Controlling is discussed, not from an autocratic position, but as a means of acquiring knowledge through information technologies, budgets and the like so as to evaluate performance against objectives; Part Seven - Perspectives gives much food for thought as it discusses the many difficult questions that face Extension as we enter the twenty-first century.

Each chapter contains several elements that make the book both readable and practical. The text of each chapter uses real-world examples to bridge the gap between concepts, theories and principles. A Focus section contains ideas, facts, applications and insights that support the text.

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The Management Experience section encourages in-depth evaluation and discussion of special topics. Various graphs and tables throughout the book visually support and reinforce the text material, while the summary of each chapter ties the main points together in a logical manner.

Extension examples may be found throughout the text, particularly in the questions at the end of each chapter. These questions are not just yes or no questions, but probe the reader into giving some thought to the complexities of management functions. The text explores management in Extension from a theoretical standpoint ranging from Maslow’s Hierarchy of Need through New Age Leadership. The information presented is not unique to Extension but the examples given apply to Extension and help the reader understand how management theory and application are essential for Extension success.

The text fits all persons within Extension, whether they are just beginning to have an interest in management or if they need to delve into one of the areas of management a little deeper. By acknowledging the need for management expertise in dealing with volunteers, the book should be useful for all Extension employees, not just those in formal management positions.
MANUSCRIPT SUBMISSION GUIDELINES

Feature Articles

Manuscripts of Feature Articles are submitted to the editor. Four double-spaced copies of manuscripts without author's name or affiliation are required. The article should include an abstract, a succinct gist of the article's content, not exceeding 150 words. A separate title page with title, institution, complete address, telephone and fax numbers, and email address for each author is required. A $25.00 submission fee is requested at the time of submission. A $10.00/page (actual pages in the journal) publication fee will be charged to the lead author upon acceptance to the journal. Articles should be no longer than 12 double-spaced 12-pitch (11 point) pages (including references, tables and figures) with one-inch margins all around.

Commentary Articles

Manuscripts of Commentary Articles are submitted to the editor. Three double-spaced copies of manuscripts are required. The article should include an abstract, a succinct gist of the article's content, not exceeding 150 words. Include on the first page of the manuscript, the title, and the institution, complete address, telephone and fax numbers, and email address of each author. There is no submission charge for the manuscript, but there will be a $10.00/page (actual pages in the journal) publication fee assessed to the lead author upon acceptance to the journal. Articles should be no longer than 8 double-spaced 12-pitch (11 point) pages (including references, tables, and charts) with one-inch margins all around.

Tools of the Profession Articles

Manuscripts of Tools of the Profession Articles are submitted to the editor. Three double-spaced copies of manuscripts are required. Include on the first page of the manuscript, the title, and the institution, complete address, telephone and fax numbers, and email address of each author. There is no submission charge for the manuscript, but there will be a $10.00/page (actual pages in the journal) publication fee assessed to the lead author upon acceptance to the journal. Articles should be no longer than 4 double-spaced 12-pitch (11 point) pages (including references, tables, and charts) with one-inch margins all around.

When submitting a manuscript, indicate type of article - Feature; Commentary; Tools of the Profession - on the first page of the manuscript, upper right-hand corner.

Disks: Authors are requested to submit the final version of their article on a computer disk. WordPerfect 5.1 is the preferred format. If using WordPerfect 6.0 or 6.1, please save as a 5.1 document. Use an ASCII (IBM compatible) format if a version of WordPerfect is not available.

Manuscripts should not have been published or be under current consideration for publication by another journal.


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