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

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

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

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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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AIAEE 1998/99 OFFICERS
From the Editor

Reflecting

As I look back on the last three years and think about January 1999 and beyond to a life without this responsibility, I share some professional and personal thoughts.

Jack Elliot, the Journal’s first editor, set a fine tradition of quality and timeliness. Three years ago, when he relinquished editorship, Jack praised the Association for coming of age. I think we can say the Journal has also come of age. Some achievements merit mention: three issues are published each year compared with two at the beginning; coverage of topics and country contexts has expanded; new sections – Commentary and Tools of the Trade – have been created; abstracts of articles have been translated into Spanish and efforts are being made to disseminate them to increase the Journal’s exposure and reach; and editorial and business management operations have been systematized, including the development of a guide. This issue, like past issues, is evidence of our commitment to quality. Feature, commentary, and tools sections represent a range of subjects in local country settings. Also included are a cumulative index of volumes 1-5 and announcements of a national extension conference in India, and a new web page for the Journal of Extension Systems.

The Journal has meant a lot to me, personally. I have grown with it, and learned to bring to the role of editor a caring and helping style with authors, reviewers, and readers. It has given me the chance to develop a sense of collegiality and friendship with helpful reviewers and fine authors, who have diligently worked to produce quality writing.

Emotions about letting go of a constant and steadfast companion are mixed. Almost doglike in devotion, the Journal was always present in my mind, willing to be summoned, often crowding out even other pressing things. I will miss the pleasurable routine and the intellectual challenge of the last three years. Yet, “not having to do the job” may be a relief. Perhaps, something as challenging will take that space and time.

To accomplish a task of this nature, a number of committed and well-meaning people work together. My thanks go to authors for sharing their scholarship with the Journal, to reviewers for providing insight and thoughtful critique, and to Journal readers, the Journal’s editorial board, and the AIAEE Board and members for their support. Associate editors Cathy Hamilton and Jim Long always had wise counsel, critical comments, and excellent suggestions. Sandra Sanders, administrative secretary in the Louisiana Cooperative Extension Service, independently cared for logistics, and literally produced the Journal on the computer.

Editing an important professional journal is so much more effective when institutional support is ungrudgingly given. Administrators in the LSU Agricultural Center and the LSU College of Agriculture never hesitated to help when asked.

The torch now passes on to Jim Connors at the University of Idaho. I wish him all the best and pledge my support.

Satish Verma
DETERMINANTS OF OPINION LEADER EFFECTIVENESS IN INFORMATION TRANSFER

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Abstract

The hypothetical assumption that the largely unsuccessful involvement of opinion leaders as influentials and information intermediaries in development and change strategies can be attributed to their incorrect identification is investigated. Supportive evidence is provided showing that the classic method of opinion leadership identification tends to identify the knowledgeable person rather than the true opinion leader. Accessibility is identified as a critical dimension of opinion leadership, and it is empirically shown that this attribute is negatively correlated with knowledge or expertise, thereby explaining why experts or incorrectly identified opinion leaders cannot be expected to have a significant impact on the diffusion process or the flow of technological information.

The Problem

Focusing communication messages on certain influentials on the assumption that their personal influence will enhance diffusion of the information and influence other members of a target audience makes sense. This is particularly appropriate where personal influence is called for, but where a wide change agent-client ratio makes one-on-one contact difficult. As such, the involvement of opinion leaders has been an essential part of most extension strategies aimed at maximizing information impact (Rogers, 1983; Sen & Bhowmik, 1970; van den Ban, 1981), and diffusion theories suggest a multi-step flow of information including opinion leaders in the key role of information intermediary (Parent & Lovejoy, 1987). Opinion leaders have also been called information leaders, gate keepers, tastemakers, decision clinchers, energizers, and influentials (Rogers & Cartano, 1962; Jones, 1964). These names may imply slightly varying functions, but can within the broader concept of “influence” be regarded as synonymous. They are informal leaders, however, and thus clearly distinguished from formal leaders.

Despite the logic and rationale for opinion leader-oriented strategies, there is little evidence regarding their success. As early as 1963, Lionberger found that over 40% of major influences leading to the adoption of farm practices could be attributed to opinion leaders. Rogers’ (1983) review of extant literature indicated only three studies reporting a positive correlation between successes achieved by the change agent and the extent to which they had worked through opinion leaders. More recent evidence suggests that the “trickle-down” of information and influence does not occur to a significant extent, and concludes that the influence of opinion leaders is grossly over-estimated (Chege, Röling, Suurs & Ascroft, 1976; Lipton & Longhurst, 1985; Parent & Lovejoy, 1987).

A likely reason for the limited evidence concerning the effect of opinion leadership on agricultural development lies in the nature of this kind of research. The challenge of reliably measuring opinion leadership and its effects is significant, especially since researchers have to rely on information from respondents which is retrospective, and tends to be rationalized and distorted (Campbell, 1966).
This exploratory study was undertaken to test the author’s assumption that a possible cause for the disappointing influence of opinion leaders could be that their identification is unreliable and/or erroneous because of an overemphasis on leader knowledge (competence) by change agents and researchers. The specific question focused on was “What are the most important determinants of opinion leader effectiveness?”.

The Purpose

The purpose of this paper is to explore the reasons for the limited influence of opinion leaders in change and development strategies by identifying the main determinants of opinion leader effectiveness, and to evaluate the comparative roles and importance of competence and accessibility as main determinants of opinion leader effectiveness.

Research Procedure

The survey area selected for the study was the Barkly West magisterial district in the Northern Cape Region of South Africa, which has an average rainfall of about 500 mm per annum and a grassland and shrub vegetation, classified as Kalahari Thornveld (Acocks, 1975). The farming community consists of about 130 white commercial farmers, farming on properties between 1,500 and 3,000 hectares, with beef, mutton sheep, and goat farming being the main sources of farm income. The average age of farmers is slightly more than 50 years, and the majority have had 12 years or more formal education.

This area was chosen because another study on the acceptability of goat farming (Marincowitz & Düvel, 1987) had been recently conducted in the area. By using the same farmers as respondents in this study, background information did not need to be collected, thus saving substantial study costs. The first survey group contained 60 goat farmers and 40 non-goat farmers. However, because of limited time, the current survey had to be confined to a 50% list sample of the original group. Ultimately, only 42 respondents could be interviewed, which equals 42% of the first group (N=100), or 32% of the farming population of Barkly West.

Group interviews were used to further save time and cost. During these interviews, each question in the survey was given to respondents at the beginning of the interview sessions and answered separately. The question was first explained by the enumerator; then, the respondents filled in or wrote their responses to the question. Measures taken to prevent respondents influencing each other, which enhanced the validity and reliability of the information consisted of (a) outlining the reasons for individual, uninfluenced responses, (b) limiting the interaction to questions and clarifying remarks, and (c) limiting the size of the interview groups to a manageable number, ranging from 2 to 6. This information-gathering technique facilitated a relaxed atmosphere and eliminated confrontational situations between the interviewer and respondents, giving credence to the findings of Lategan and Düvel (1992) concerning the effectiveness and usefulness of the group interview technique.

The author’s assumption that the diminished influence of opinion leaders is due to their incorrect identification implies that different types of influentials can be identified. The categories used in the study were:

1. **Quasi opinion leaders**: Individuals identified by the commonly used sociometric method wherein respondents are asked to nominate individuals with whom they would consult regarding various problems or subjects. They are nominated mainly for their knowledge or expertise. Some of them may have been consulted to qualify as true opinion leaders, while others may not be consulted at all.

2. **Experts**: Individuals specifically identified by respondents as experts in their field of knowledge. They included (a) individuals not consulted, and (b) individuals who are consulted. The latter group is also referred to as “expert opinion leaders”.

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3. **Opinion leaders**: Individuals who are actually consulted on problems, and are true opinion leaders.

In the study itself the identification of these different categories was done systematically. Respondents were first asked to nominate those individuals with whom they would consult regarding various branches of farming. These became the quasi opinion leaders. Subsequently, respondents were asked, regardless of their previous nomination, to distinguish between the knowledgeable persons (experts) and those they actually consulted (opinion leaders).

Because of resource constraints, the author had to rely on respondents’ judgments of whether consultation did or did not take place to distinguish between true opinion leaders and the other categories. Other quantitative information regarding the number of deliberate and coincidental consultations was also gathered. All persons nominated by respondents to the several leader categories were assessed by respondents in respect to accessibility, expertise, friendship, and reciprocity of consultation using 10-point semantic differential scales.

The use of respondents’ perceptions as a measure of accessibility provided for both the psychic and physical aspects of accessibility, but gave no indication of their relative importance. However, because the survey area is small and has a good communication infrastructure, the variation in perceived accessibility is assumed to refer mainly to psychic accessibility.

Data interpretations were based on frequency distributions, chi-square analyses, and Spearman’s rank correlations.

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**Results and Discussion**

**Categories of Influentials**

The nominations of respondents shown in Figure 1 show considerable overlapping among the three categories of influentials. Whether and to what degree opinion leaders are confused with experts, i.e., the knowledgeable or competent individuals of a community, can be determined from this comparison of the different types of nominations.

The assumption is that, if respondents are inclined to nominate an expert rather than an opinion leader, the overlapping between experts and quasi opinion leaders (a) will be greater than the overlapping between opinion leaders and quasi opinion leaders (b). The findings in Figure 1, which reflects the overlap percentages of nominations in possible two-category combinations support this hypothesis, at least for the major branches of farming. In the case of dryland crop production, which is of minor importance, this trend was not observed. A possible explanation is that the nominations of influentials in branches of farming not practiced by many respondents are likely to be unrealistic and consequently less valid. In all branches, there is a significant overlap between experts and opinion leaders (c), which explains why the assumed differences are not more pronounced and why the identification of quasi opinion leaders hypothesised to be experts rather than true opinion leaders includes a fair number of the latter.

**Accessibility of Influentials**

These findings support the necessity of distinguishing between experts and opinion leaders, since an unqualified question as to “whom the respondent would consult” (quasi opinion leader) tends to identify the expert rather than the person actually consulted (opinion leader). The observation that opinion leaders – when incorrectly identified as experts and thus mistaken for opinion leaders – have not exercised the desired diffusion impact may be ascribed to their inaccessibility or insufficient accessibility.
Generally, expertise or competence is widely regarded as one of the most important dimensions of credibility (Rogers, 1983). However, the flow or diffusion of information is unlikely without accessibility between followers and the so-called opinion leader. Van der Wateren’s (1987) findings support the presumption that accessibility, both physical and psychic, is essential for the establishment of a consultative relationship. Seen against this background, the expert is expected to be less accessible than the person who is consulted, namely the opinion leader.

From Figure 2, which shows the mean accessibility ratings of nominated experts, opinion leaders, and expert opinion leaders (both experts and opinion leaders), it is observed that experts had a significantly lower accessibility rating than opinion leaders (chi-square=30.18; p=0.0001, df=4). Persons regarded as expert opinion leaders were found to be as accessible as persons regarded as opinion leaders, there being no significant difference between these groups (chi-square=5.3; p=0.26, df=4). These results strengthen the significance of accessibility, which is different from competence and essential for the effective flow of information.

**Measuring Accessibility**

If accessibility is a key dimension of opinion leadership, its more accurate measurement becomes an important consideration, and its relationship with related variables needs to be explored.

![Figure 1. Overlapping of respondents’ nominations of quasi opinion leaders, experts, and opinion leaders.](image-url)
The positive relationships found by Van der Wateren (1987) between accessibility and features such as honesty, fairness, popularity, similarity in attitude, and psychic distance, leads to the presumption that friendship may be synonymous with or at least closely related to accessibility. If this is the case, friendship could be used as an indicator or barometer of accessibility.

A positive linear correlation (r=0.54; p=0.0001) was found between accessibility and friendship (Figure 3). This relationship is more pronounced above the scale value of five (out of a possible 10), which may be seen as a threshold value beyond which friendship could be used as a parameter of accessibility.

In view of the close relationship observed between friendship and accessibility, it could be expected that the difference between opinion leaders and experts on accessibility (Figure 2) would also apply on friendship. This is shown in Figure 4.

The similarity between friendship and accessibility is clear from a comparison of Figures 2 and 4. Differences among the groups, however, are greater on accessibility. This may indicate that respondents are more outspoken (and honest) about accessibility than friendship. This presumption is confirmed by the finding that 56.8% of the experts were rated lower than 5 out of 10 on accessibility, while only 13.6% of the same group were assessed lower than 5 out of 10 on friendship.

Figure 2. Mean accessibility ratings of nominated experts, opinion leaders, and expert opinion leaders.

Figure 3. Relationship between accessibility and friendship based on mean ratings of respondents.
Another measure of opinion leadership was assumed to be reciprocal consultation. This is based on the notion that consultation, or the provision of advice, is a “favor” from the person consulted (leader) to the person receiving the advice (follower). It is assumed that, except where a consultation fee is paid, frequent consultation increases the “debt”, consequent “guilt”, and reluctance of the follower to receive further “favors” from a particular individual, unless some compensation can be provided. One form of compensation is to establish an exchange of advice or information between the concerned parties. In this manner, the reciprocity of consultation is expected to increase accessibility between two individuals, and thus the influence of the opinion leader. Mutual consultation is expected to be much more proportionate between the follower and the opinion leader, than between the follower and expert. Results of the study confirm this, because, in respect of the expert, the average ratio of consultation to being consulted was 6.2 : 3.8, while in the case of the opinion leader it was 5.7 : 4.3.

The slightly greater consultation frequency of experts (6.2) as compared with opinion leaders (5.7) was unexpected, but could be ascribed to the phenomenon that several experts are also true opinion leaders, and/or that respondents tended to overrate their own influence. The consultation relationship between respondents and those identified as expert opinion leaders was of the same order, namely 6.3:3.7. The positive linear correlation (Spearman correlation=0.137; p=0.015) between accessibility and reciprocal consultation was statistically significant. Although this correlation is low, it serves as an indication of the possible importance of reciprocity of consultation in diffusion or opinion leadership.

Expertise would be acceptable as an indicator of opinion leadership provided expertise is correlated with accessibility. However, results of this analysis (Table 1) show a negligible relationship (Spearman rank correlation=0.085; p=0.14).

It could be argued that if no knowledge gap is perceived by an individual to exist between him/her and another person, consulting such a person would be pointless because some expertise in the opinion leader is probably a prerequisite for a worthwhile consultative relationship. It could even be expected that a person, given the same perceived accessibility, will prefer or choose to consult the person with the highest perceived level of knowledge. However, when judged on weighted means, there is a slight tendency for accessibility to decrease with an increasing knowledge gap between the opinion leader and the follower (Table 1).
That a perceived knowledge gap is important, if not a prerequisite for consultation, is supported by the findings in Table 2, which gives the average knowledge gap (using a 10-point assessment scale) between respondents and the different categories of influentials. In all cases, there was a difference in the level of knowledge. Even for opinion leaders, it was an appreciable 1.89 scale points or 21%.

In the previous analyses, consultation was measured quantitatively. However, if frequency or quantity of consultation takes precedence over quality or significance of the consultation, accessibility will be a dubious measure of opinion leadership. Since it is difficult to determine quality in terms of significance of the advice received by followers, purposeful consultation was taken as an indication of quality, assuming that worthwhile advice valued by the individual is sought purposefully, as opposed to coincidental consultation. The latter is probably more common with high accessibility and frequent contact.

Findings in Table 3 indicate this was not the case. The correlations between type of consultation (purposeful or coincidental) and accessibility show that purposeful consultation is more closely related to accessibility than coincidental consultation. Furthermore, the negative correlations between expertise and both purposeful consultation and coincidental consultation confirm that knowledge or expertise is not a good indicator of opinion leadership.

Table 1.

Distribution of Respondents According to Accessibility and Knowledge Gap Between Opinion Leaders and Followers.

<table>
<thead>
<tr>
<th>Accessibility</th>
<th>Absent or negative (0)</th>
<th>Small (1)</th>
<th>Fair (2)</th>
<th>Large (3 and more)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1 0</td>
<td>9 8.9</td>
<td>17 12.3</td>
<td>7 10.6</td>
<td>33 10.2</td>
</tr>
<tr>
<td></td>
<td>2 2</td>
<td>11.8</td>
<td>16 15.8</td>
<td>24 17.4</td>
<td>53 16.5</td>
</tr>
<tr>
<td></td>
<td>3 3</td>
<td>17.6</td>
<td>18 17.8</td>
<td>34 24.6</td>
<td>69 21.4</td>
</tr>
<tr>
<td></td>
<td>4 6</td>
<td>35.3</td>
<td>19 18.8</td>
<td>33 23.9</td>
<td>78 24.2</td>
</tr>
<tr>
<td>High</td>
<td>5 6</td>
<td>35.3</td>
<td>39 38.6</td>
<td>30 21.8</td>
<td>89 27.6</td>
</tr>
<tr>
<td>Weighted mean</td>
<td>3.94</td>
<td>3.62</td>
<td>3.25</td>
<td>3.34</td>
<td>3.43</td>
</tr>
</tbody>
</table>

r=0.085; p=0.14

Table 2.

Mean Knowledge Gap Between Respondents and Their Nominated Influentials.

<table>
<thead>
<tr>
<th>Category of influentials</th>
<th>Mean knowledge gapa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experts</td>
<td>2.37</td>
</tr>
<tr>
<td>Opinion leaders</td>
<td>1.89</td>
</tr>
<tr>
<td>Expert opinion leaders</td>
<td>2.44</td>
</tr>
</tbody>
</table>

a: 10-point assessment scale
Table 3.

Rank Order Correlations Between Different Types of Consultation and Accessibility and Expertise Respectively.

<table>
<thead>
<tr>
<th>Type of consultation</th>
<th>Accessibility</th>
<th>Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>p</td>
</tr>
<tr>
<td>Purposeful</td>
<td>0.354</td>
<td>0.0001</td>
</tr>
<tr>
<td>Coincidental</td>
<td>0.247</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Conclusions

Although the findings of this exploratory study cannot be extrapolated beyond the study area it appears that competence is not the only or most important dimension of opinion leadership. The unawareness of this proposition has probably resulted in an incorrect identification of opinion leaders in that experts are mistaken for opinion leaders. This leads to the conclusion that the incorrect identification of opinion leaders has been the major reason for their limited impact on the diffusion of information. If strategies of change are to be based on the involvement and effective use of opinion leaders, then great care should be taken to identify them.

It can also be concluded from the findings of the study that accessibility is important, if not more important, than competence. It appears to be a key factor in opinion leadership and should feature in the identification of opinion leaders. In this regard, friendship, which was found to be closely related to accessibility, offers possibilities of measurement. It, however, has the disadvantage of discriminating among leaders less than accessibility seems to do.

Further research is essential, especially since opinion leadership was analyzed quantitatively and not qualitatively. Competence will probably be more prominent than accessibility if the nature and importance of consultations are studied, not just the quality.

References


TESTING DECISION TREES AS TOOLS TO HELP AGRICULTURAL EXTENSION STAFF ADVISE GHANAIAN FARMERS ON EFFECTIVE MAIZE STORAGE OPTIONS

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Abstract
Choice, together with the process of making that choice, is a critical issue in agricultural extension education. This calls for an understanding of farmers’ decision-making processes by agricultural extension staff which can help them to work more effectively with their clientele, as individuals and in groups. The purpose of this study was to determine the decisions on maize storage options made by farmers in the Volta Region of Ghana using a decision tree approach. The results indicated that the use of the decision tree is situation-specific, and is more effective with individual farmers than with groups. However, it is useful in group situations for creating problem awareness, and generating discussions among group members to bring out diverse views on recommended practices and options.

Introduction
Maize is the most important grain crop in Ghana. However, most farmers experience very high storage losses, with estimates reported at between 30-40% (Ghana Statistical Service, 1995). One of the recent factors contributing to high storage losses being experienced by Ghanaian farmers is a new and destructive pest of stored maize, the Larger Grain Borer (LGB) – Prostephanus truncatus (Horn). The LGB can turn the maize grains into powder, causing high losses to farmers and threatening their food supply and income. Preliminary results of a draft model to predict the possible impact of LGB in Ghana indicate that, if no action is taken to curb the outbreak of the pest, it could cause losses in maize of up to 30 billion cedis (about US$17 million) per annum (Boxall, 1995).

The LGB is most severe in the Volta Region of Ghana. A bilateral United Kingdom-Ghana Project, under the auspices of the Overseas Development Administration was launched in 1992 to work with farmers on the development, selection, and use of a series of maize storage options for controlling the LGB. The LGB Project is investigating, in close collaboration with farmers and extension staff, possible ways of controlling the new destructive pest, including improved storage methods. The focus of the LGB Project is to help farmers to select the most viable options from multiple recommendations, keeping in view their financial, technical, and socio-cultural situations.
The Agricultural Extension Service in Ghana

The agricultural extension service in Ghana is largely publicly funded and managed. One of the critical problems of the extension service is the poor training of extension staff at all levels. The majority (85%) of the current extension staff of the Ministry of Food and Agriculture possess a 2-year post-secondary school certificate. The dominant communication approach used by extension staff is a linear model. Researchers act as the main source of "good" technologies while extension staff act as a conduit for the transfer of technologies from researchers to farmers, who in turn are expected to use the recommended technologies. Only a small number of extension staff in Ghana have received training in participatory extension approaches, such as the decision tree approach, which the staff could use to give farmers several choice options to deal with the high risks and uncertainties of farming.

Agricultural extension staff in Ghana have been trained to be the deliverers of technology, not facilitators of a process to involve farmers. Thus, most of the staff do not make provision for eliciting farmers’ ideas about the development and adaptation of new agricultural technologies. Where researchers and extension staff involve farmers at all, the farmers are only expected to follow staff directives. Thus, farmers play a passive role. As a result, recommendations from researchers and extension staff are often not appropriate to most farmers’ situations.

The Use of Decision Trees as Tools in Eliciting Information for Extension Education

Farmers’ decision-making process is the key to the adoption of agricultural innovations. Agricultural extension staff must have a thorough understanding of the decision-making process to enable them to help farmers to better achieve their goals. However, as van den Ban and Hawkins (1988) note, making a choice is difficult because we are usually uncertain about what the outcome will be. In the decision-making process we use information (knowledge) to reduce this uncertainty. Therefore, choice and knowledge must be examined simultaneously.

A decision tree is a graphic representation of how individuals make decisions. The decision tree modeling method has been used during the past two decades by ethnographers in many cultures to elicit and predict the actual choices of individuals in a group (Gladwin, 1976; Gladwin, 1979; Gladwin, Zabawa & Zimet, 1989; Pierre-Yves, 1995). Decision tree can be a useful agricultural extension tool in eliciting and tailoring messages and research recommendations to farmers’ situations.

According to Compton (1994), the decision tree is a useful way of (a) capturing the current state of knowledge, (b) distinguishing pieces of information essential for making decisions from those which are merely interesting, and (c) pointing out gaps in knowledge. Gladwin (1979), and Gladwin, Zabawa and Zimet (1989) provide empirical results to show that the decision tree can be used as an advisory tool to elicit information from individuals about their decision-making criteria on choices of recommendations, and to find out why a particular individual or a group of people acts in a certain way. Making specific reference to pest management, Mumford and Norton (1984) opine that when research and extension programs in pest control are being developed, it is important that an early attempt is made to obtain information on farmer perceptions on the constraints affecting certain options and on farmers’ objectives.

Methodology

This study was a follow-up on the results of a Participatory Rural Appraisal (PRA) which was done in the LGB Project with maize farmers, maize traders, and extension staff in the major agro-ecological zones in the Volta Region regarding the best options for storing maize. The PRA results indicated use of several indigenous pest control materials, including the neem tree, wood ashes, smoke, and lime.
experiments had been conducted to assess the effectiveness of some indigenous pest control methods in controlling LGB (Addo, 1994). However, none of these methods was found to be effective in controlling LGB infestation, especially for long-term (more than one month) storage of maize. Based on the PRA results and three years of working experience with farmers, the LGB Project developed decision trees depicting various recommendations for the best storage options available to farmers.

Since decision making is very subjective and personal, involving a careful thought process, it is important to recognize the unique context and the larger system within which specific choices are being made when eliciting information about the decision-making process of an individual or a group of people. Therefore, this study was designed to test the decision trees in the LGB Project, especially with regard to two key questions: (a) “How do I store my maize?”, and (b) “My store is infested – What shall I do?”

The study was carried out from January to November 1995 in eight villages in the Volta Region. The villages were drawn from four of the five agro-ecological zones of the region. The fifth zone was not included because LGB was not a serious problem there at the time the study was conducted. The selection of the villages was purposive and was based on the following criteria: (a) the incidence of LGB in the area, (b) the importance of maize growing and storage in the area, and (c) representation of the major agro-ecological zones in the region. The study was carried out in consultation with key stakeholders of the farming systems in the study area, including the LGB project staff, extension staff of the Ministry of Agriculture, farmers, and maize traders.

Individual interviews and focus group discussions with farmers, maize traders, and extension staff were used to collect data. Decision trees were tested on 102 randomly selected maize farmers in the eight purposively-selected villages. Informal discussions were held with 20 extension staff in the study area to get their assessment of the approach of generating and constructing a decision tree to represent farmers’ decision-making processes.

Results

Out of the total of 102 farmers surveyed, 55% were men while 45% were women. The majority (71.5%) of them were between the ages of 31-50. With respect to how they usually handled and used harvested maize, 61% of the respondents indicated that they stored maize for both sale and food, 18.7% for sale only, and 20.3% for food only. Regarding experience with LGB infestation of stored maize, 28% of the respondents indicated that they had experienced LGB in previous years.

Decision Tree 1, “How do I store my maize?”, depicts farmers’ infestation history, threshold price expectation, time for keeping maize, expected maize use patterns, and whether the steps provided on the tree were popular or not. Farmers’ answers to the first question on the tree led to the development of the paths as well as the recommendations on the tree. The cost-benefit of choosing each option was analyzed with the farmers, and the implications of the choices were explained to them.

Decision Tree 1 was tested with 88 farmers to see how they would respond to the options in actual practice. Seventy-four farmers (84%) indicated that they stored maize in the husk for more than three months, while 14 farmers (16%) stored maize for less than three months in this manner. Farmers who stored maize for less than three months gave the following reasons: (a) good price for the early harvested maize, (b) defray debt, (c) need money for preparing new farm plot, and (d) fear of envy from other farmers who may not get good harvests.
[Figure: Decision Tree 1]
Contact Editor for graphic.
[Figure: Decision Tree 2]
Contact Editor for graphic.
The villages in which this study was conducted are ranked among the high LGB risk areas. Based on PRA results and the experience of the LGB Project, the most suitable option available to farmers for protecting their stored maize from LGB damage is to “shell and treat” the maize with a chemical called Actellic Super. The farmers’ decision-making process for the control of LGB was compared with the LGB Project’s recommendations (Decision Tree 2). Sixty-six farmers took part in this exercise. However, as Figure 1 indicates, only 26 farmers (39.4%) followed the “shell and treat” recommendation when their maize is infested by LGB. Twenty-one farmers (31.8%) who did not follow the recommended practice either sold their maize or used it for other purposes giving the following reasons for their action: (a) needed money for clearing a new maize plot, (b) unexpectedly high selling price for maize, (c) no chemical in the village, (d) fear the effects of chemical on maize for family food, and (e) maize used for unexpected funeral and other emergencies. Nineteen farmers (28.8%) did not consider the “shell and treat” recommendation before taking an unrelated action. This means that the “shell and treat” recommendation alone is not suitable to all maize farmers and they should be given other options.

It is important to point out that the respondents who feared the effects of the use of chemicals in storing maize were all women. If women, who are estimated to account for about 90% of food processors, are not willing to use chemicals to store large quantities of food crops, then Ghana’s food security is at risk, especially in case of an unexpected severe outbreak of LGB. This means that more women farmers should be reached by the extension service to explain to them the need for appropriate and timely use of chemicals for maize storage, and to convince them about the safety of these recommended chemicals on food crops.

Farmers’ perceptions and the criteria they use for judging maize storage losses should be considered within their unique context and social system. For example, the LGB Project defines a maize damage threshold as the observed level of damage in the outer wall of the barn caused by LGB at which the farmer decides to take any control measure to prevent further losses. According to the LGB Project’s recommendation, three damaged cobs out of every hundred cobs seen outside the barn should serve as the threshold – a point when the barn should be brought down within one month. In this study, however, farmers perceived a maize damage threshold differently. In Penyi village, for instance, where maize is a staple food and is removed from the barn regularly, farmers examine the maize while dehusking and shelling, and determine their own damage threshold. In contrast, in Dzolokpuita and Dzogbekope villages, where maize is not removed regularly from the barn, the damage thresholds are determined by listening to the noise of insects in the stack, and looking for powder on the cobs.

An attempt was also made in the study to find out whether females differed from males on the number of LGB damaged cobs considered as the acceptable threshold, beyond which the farmer would no longer accept any insect damage and, therefore, would take action to control or eliminate the insect. Three cobs out of a hundred cobs (3%) was accepted as the threshold for the female group, while thirty cobs

![Shell and Treat Recommendation](image-url)
out of a hundred cobs (30%) was accepted by the male group. This seems to confirm the general opinion of the LGB Project staff that the LGB (and other pests) problem has been of more concern to women than to men, because women are generally responsible for food processing, preservation, storage, and preparation in Ghana.

Informal discussions were held with 20 extension staff in the study area. The aim was to get their assessment of the approach of generating and constructing a decision tree to represent farmers’ decision-making processes. Eighteen staff (90%) indicated that the approach was very useful in helping extension staff to understand how farmers make choices. They indicated that the process was participatory, helpful in facilitating dialogue between farmers and extension staff, helpful in bringing out issues from the farmer’s point of view which is essential for adoption of innovations, and helpful in identifying farmers’ situations and thus enabling them to choose the most appropriate options. Two staff (10%) indicated that the construction of a decision tree involves too many arrows (paths), thereby making the process rather complicated and difficult to use practically. This is an interesting finding, because it reinforces the fact that many extension staff tend to view farmers’ problems as simple, straightforward, and unidirectional. However, in real life, farmers normally encounter complex and multifaceted problems which do not lend themselves to simple, shortcut choices.

**Conclusion**

The decision tree is an excellent tool for informing extension staff of the specific choices farmers make and the rationale for those choices. The experience from this study indicated that the use of the decision tree is better suited to individual farmer’s choice making rather than group choice making, even though the group process of generating a decision tree is valuable for creating awareness about a problem and generating discussion among group members. However, it would appear that the decision tree is better adapted to specific individual situations rather than the diverse needs of group members because farmers, even those within the same village, do not usually have the same needs or goals. Each farmer makes his or her decision based on past experience and the unique context or environment within which he or she operates. As van den Ban and Hawkins (1988:91) pointed out, each farmer makes decisions based on probability estimates. Extension staff can, and should, play a useful role in helping farmers make their decisions on the basis of what they perceive as the most correct probability estimates.

**References**


PERCEPTIONS OF RICE FARMERS OF THE NATIONAL AGRICULTURAL EXTENSION PROGRAM IN THE CASAMANCE, SENEGAL

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Abstract
The agricultural extension program of Senegal, a national government initiative since 1985 based on the Training and Visit (T&V) approach, was studied in the Casamance with respect to rice, the main agricultural crop of the country and the region. A sample of 1,004 rice farmers in the two districts that make up the Casamance was personally interviewed to determine their perceptions about the extension program. A small percentage of farmers recalled participating in rice production meetings, knew the subject matter topics discussed, and viewed agents favorably. The majority of farmers preferred radio over agents and neighbors for rice production information. Although farmers passed on information gained from meetings and encouraged others to attend, they did not reach the number recommended by the T&V approach.

Introduction
Rice is the staple food of Senegal and accounts for 40% of the diet of the country’s population of 6.9 million people. Even though the population of Senegal is essentially rural and largely involved in rice production, the country has an annual deficit of 50,000 metric tons of rice. To overcome this deficit, the government has undertaken agricultural extension programs to assist rice farmers in adopting new technology for increasing the yield and total output of rice.

Rice Farming in the Casamance
The Casamance, in the southern part of Senegal, is the main rice growing area of the country. Two major ethnic groups, the Joola and the Mandinka, are involved in rice production. The Joola has a very old rice cultivation tradition dating back to 300 AD and a cultural identity with the crop (Linares, 1970). Wealth is gauged by who produces the most rice and who has the oldest rice stocks in their granaries.

The Joola is the predominant ethnic group in the Ziguinchor Region of the Casamance. Joola men and women work together in the rice fields, and also raise cash crops. Men plough the soil and women plant seeds or plantlets (seedlings). On the other hand in the Kolda region, which is dominated by the Mandinka, women are responsible for rice production while men are responsible for cash crop production.

A number of constraints have been identified in rice production in Senegal. The total area planted to rice has drastically declined compared with other crops due to decreased rainfall, increasing soil erosion, and declining soil...
fertility. Limitations in new technology adoption can be traced to the low level of technical knowledge and skills of farmers and the non-availability of bank loans due to the high risk associated with agricultural credit, the writing off of farm loans, and/or denial of new loans (United States Agency for International Development, 1991). Kite, Keita and Thiam (1992) found that recommended rice production technology was not being followed by a large number of farmers in the Casamance. For example, only 13% of farm households in Ziguinchor and 27% in Kolda used chemical fertilizers. Animal power is limited in Ziguinchor due to low draft ownership (Kite et al, 1992) and steep land (Linares, 1984). This opens up the possibility of small power tillers (SOMIVAC, 1987).

**Senegal’s Extension Service**

According to the categorization suggested by Baxter, Slade and Howell (1989) the extension service in Senegal has utilized three different organizational approaches over the last 35 years: (a) *Animation Rurale* or rural mobilization, (b) commodity-oriented extension, and (c) the Ministry of Agriculture’s government extension service. *Animation Rurale* lasted only about four years. It focused on the sensitization and education of farmers in community development. Commodity-oriented extension was similar to project-type extension, promoting the production of cash crops for export. The government approach began in 1985 as part of the country’s new agricultural policy and was called the National Agricultural Extension Program (NAEP).

NAEP is unique in that it has a small administrative and technical component at the top and conducts its programs essentially through field extension staff of the National Agricultural Service (NAS) and volunteers of non-governmental organizations (NGOs), providing its collaborators with transport, office supplies, and staff allowances.

Thirty extension agents work in NAEP in the Casamance Region. All agents are men and range in age from 24 to 51 years. Although the agents are from many ethnic groups, the predominant ethnic groups are the Joola and the Fulani. None of the agents has a University college education. Most have achieved a three-year secondary agriculture school education. Though their educational level seems low, most of them have considerable experience in agricultural extension, averaging 16 years, and being involved with NAEP for an average of 3 years. The majority of the extension agents know the languages used by the farmers.

NAEP used the French edition of the World Bank’s Training and Visit Extension System (T&V) as an operating framework (Benor & Baxter, 1988). Like most developing countries, Senegal adopted T&V to secure funding from the World Bank to financially support its agricultural extension program (Dejene, 1989).

The basic strategy of T&V is to get farmers to adopt improved agricultural technologies through an educational process. The concept was that professional extension agents would receive training in specific, seasonally-appropriate crop production practices. These agents would then make individual visits twice a month to a select group of contact farmers to educate them in those practices. In turn, each contact farmer was expected to communicate the information received from the extension agent to ten other neighbors, thus achieving a multiplier effect (Dejene, 1989). Benor and Baxter (1988) posit that this kind of farmer-to-farmer extension is more cost-effective than the conventional extension service, and can help develop local leadership and self-confidence, and promote technology adoption.

Studies to determine the effectiveness of T&V conducted in several countries in Asia and sub-Saharan Africa have yielded mixed results. Mazur and Titiola (1992) conducted a comparative study of T&V in Asian and African countries and found that it was more effective and efficient in Asia. Country-specific studies in Africa have documented shortcomings. Dejene (1989) observed that the T&V communication network in Ethiopia which was...
to be used to disseminate information to non-
contact farmers in the community equivalent to
ten times the number of contact farmers did not
work as expected. Moreover, as many as 25%
of the contact farmers did not gain requisite
knowledge and skills. In Cameroon, Tchouama
and Steele (1997) found that after five years of
T&V implementation only 30% of sample
respondents reported contact with their village
extension worker, and a majority of these had
difficulty applying the extension worker’s
recommendations. In a study of T&V in
Nigeria, Asiabaka and Bamisile (1992)
determined that extension agents had favorable
attitudes and considered their work challenging,
but lack of communication skills, insufficient
transportation facilities, and cultural differences
detracted from their effectiveness. Diamond’s
(1994) study in Swaziland found that a modified
version of T&V offered the best structure for
that country’s needs. Kite et al. (1992) studied
the implementation of T&V in Senegal and
found that most farmers were aware of the
recommendations for fertilizers and other inputs,
and used family members (60%) as a source of
technical knowledge to a greater extent than
extension agents (30%).

This study was conducted to add to the
understanding of T&V in the National
Agricultural Extension Program of Senegal’s
Casamance Region, specifically focusing on
farmers’ perceptions of the program.

Purpose and Objectives

The primary purpose of the study was to assess
how effectively the twin goals of farmer
participation and information diffusion in T&V
were being accomplished in the Casamance
Region. Specific objectives were to determine
(a) personal and farming characteristics of rice
farmers, (b) farmers’ perceptions of rice
production meetings and technology learned,
and (c) the use of information sources by, and
information diffusion patterns of rice farmers.

Methodology

Population

The target population was rice growers in the
Casamance belonging to the two major ethnic
groups, Joola and Mandinka. The field study
was restricted to the Department of Bignona in
the Ziguinchor Region and the Department of
Sedhiou in the Kolda Region due to poor roads
and constraints on the researcher.

Instrumentation

The questionnaire used for data collection was
developed by the lead author. It was written in
English, and translated and administered in
French, the official language in Senegal. It
included questions focused on the study
objectives.

Three validation steps were involved. First, the
instrument was reviewed by the researcher’s
graduate committee. A second review was done
by an expert in social science surveys with 15
years of experience in the local area in
collaboration with the researcher and his
committee chair. Finally, an on-site pilot study
was conducted by the researcher under the
supervision of his committee chair. Ten
interviewers were hired and trained for this
purpose. They interviewed 50 farmers in each
of the two regions, over a ten-day period. Pilot
study locations were randomly selected from
villages where there were NAEP participants.

Sampling

The study used a sample of 1,016 households
equally distributed among the two departments
(Bignona and Sedhiou). The researcher chose to
oversample to ensure that findings could be
generalized to all rice growers in the Casamance
at the lowest margin of error.

A list of all villages involved in the NAEP was
obtained at the time of the pilot study (January
1995). A table of random numbers was used to
select villages. Two arrondissements each were
randomly selected from Bignona and Sedhiou
A rural community was chosen from each of the arrondissements in Bignona; in Sedhiou a total of three communities had to be selected because of lower participation in NAEP. A total of six villages was finally selected in Bignona, and nine villages in Sedhiou. All farm households in the selected villages were included for interviewing regardless of their participation in NAEP.

Data Collection

The same ten interviewers hired for the pilot study did the actual survey. They were selected for their experience in survey work and knowledge of local languages. All interviewers attended a meeting with the researcher during which the questionnaire was explained once again, and precise instructions were given to ensure that valid information was gathered. Since females are in charge of rice cultivation, women, if present at the time the interviewer called on them, were the preferred subjects. If not available, husbands could be interviewed. In Bignona, where men and women work together in all agricultural activities, the questionnaire could be administered to either the man or the woman of the household depending on who was home at the time. Each interviewer completed five interviews in a day, on average.

Findings

Characteristics of Farmers

Usable survey responses totaled 1,004. Major ethnic groups to which respondents belonged were Joola (68%) and Mandinka (26%). Islam was the dominant religion (997 or 98%); a small number were Christian (15 or 1%) and traditional African (4). Most respondents were married (89%). There were nearly twice as many males (64%) as females (36%). As many as 8 out of 10 respondents had never attended school. Of those who went to school, 12% did so at the elementary level (1-6 years), and 8% at high school. Average age of respondents was 48 years, male respondents 53 years, and female respondents 42 years. Average number of years of formal school was only 1.03 years. Males had more schooling than females (1.79 years vs. .26 years).

Younger respondents had more schooling than older respondents. Respondents between the age of 15 and 30 years had an average of 2.49 years of formal education, those between 31 and 50 years had an average of 1.89 years, and those beyond 50 years of age had less than a year of formal education.

Three fourths of the respondents owned rice land. The remaining 25% rented or borrowed from husbands, brothers, fathers, or other relatives. Nearly 90% of the renters/borrowers were from the Kolda region. The average size of rice fields was 1.5 hectares, with little difference between the two regions. Besides rice, a majority of the respondents grew other crops. This pattern was found to be more prevalent in Kolda than Ziguinchor.

Farmers’ Perceptions of Rice Production Meetings

The farmers were asked if they had ever attended informational meetings concerning rice production practices and who organized the meetings they attended. Twenty-nine percent of the respondents recalled attending meetings organized by the NAEP, projects of parastatal bodies, and NGOs as shown in Table 1. Most of the participation was in parastatal-organized meetings (52%) followed by NGO-organized meetings (41%), and NAEP-organized meetings (7%).

Farmers were asked if they personally knew the person who organized the meetings. The majority (97%) of them personally knew the extension agents who organized meetings, but did not know how NAEP was organized. They tended to associate agents with the local level organization of parastatals (48%) and NGOs (44%), rather than with the NAEP (8%). Knowledge of NAEP was greater in Ziguinchor (68%) than in Kolda (32%).
Farmers were asked to recall the specific topics discussed at rice production meetings. A variety of topics was indicated by respondents ranging from chemical fertilizers (167 or 63%) to the use of draft animals for cultivation (96 or 36%). All topics mentioned are shown in Table 2.

Farmers who recalled participating in meetings (n=288) were also asked if they liked the meetings and why. Ninety-three percent (268) said that they liked the rice meetings. Reasons for liking meetings were: useful topics were presented (93%); agents openly discussed problems (18%); agents were knowledgeable (12%); have good relationships with agents (5%). Reasons for not liking meetings were: did not learn anything useful (12 respondents); agents did not openly discuss problems (7 respondents).

### Table 1

**Participation of Farmers in Rice Production Meetings Organized by Extension Agencies.**

<table>
<thead>
<tr>
<th>Region</th>
<th>Parastatals (Projects)</th>
<th>NGOs</th>
<th>NAEP</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Ziguinchor</td>
<td>108</td>
<td>72</td>
<td>52</td>
<td>45</td>
</tr>
<tr>
<td>Kolda</td>
<td>43</td>
<td>28</td>
<td>64</td>
<td>55</td>
</tr>
<tr>
<td>Casamance</td>
<td>151</td>
<td>100(52)</td>
<td>116</td>
<td>100(41)</td>
</tr>
</tbody>
</table>

* Government-sponsored water management projects since 1989  
* % of farmers who attended meetings

### Table 2

**Meeting Topics Reported by Rice Farmers.**

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>Frequency of Mention</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical fertilizers</td>
<td>167</td>
<td>63</td>
</tr>
<tr>
<td>Planting in rows</td>
<td>154</td>
<td>58</td>
</tr>
<tr>
<td>Improved seeds</td>
<td>149</td>
<td>56</td>
</tr>
<tr>
<td>Composting techniques</td>
<td>117</td>
<td>44</td>
</tr>
<tr>
<td>Plowing techniques (flat plowing)</td>
<td>115</td>
<td>43</td>
</tr>
<tr>
<td>Weed control techniques</td>
<td>111</td>
<td>42</td>
</tr>
<tr>
<td>Draft animals for cultivation</td>
<td>96</td>
<td>36</td>
</tr>
</tbody>
</table>

Use of Information Sources and Information Diffusion

Farmers were asked “What is your source of information about rice production practices?” The sources of information cited by respondents are shown in Table 3. For the Casamance, radio was the most-preferred source (430 or 43%), followed by neighbors (282 or 29%), and agents (278 or 28%). While radio was used at about the same level by respondents in the two regions, neighbors were used more than agents in Kolda (63%), and agents more than neighbors in Ziguinchor (61%).

Male rice farmers tended to designate extension agents as their source of information more so than the female rice farmers. In Ziguinchor, men and women did not significantly differ in terms of sources of information. But in Kolda, men more than women tended to use extension agents as a source of information.
Table 3.
Rice Production Information Sources Used by Farmers.

<table>
<thead>
<tr>
<th>Region</th>
<th>Radio n</th>
<th>Radio %</th>
<th>Neighbors n</th>
<th>Neighbors %</th>
<th>Agents n</th>
<th>Agents %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ziguinchor</td>
<td>232</td>
<td>54</td>
<td>103</td>
<td>37</td>
<td>169</td>
<td>61</td>
</tr>
<tr>
<td>Kolda</td>
<td>198</td>
<td>46</td>
<td>179</td>
<td>63</td>
<td>109</td>
<td>39</td>
</tr>
<tr>
<td>Casamance</td>
<td>430</td>
<td>100(43)%</td>
<td>282</td>
<td>100(29)%</td>
<td>278</td>
<td>100(28)%</td>
</tr>
</tbody>
</table>

*% of all respondents

Farmers were asked to respond to the following questions: a) Did you encourage some of your neighbors or friends to attend meetings? b) How many persons? c) How many females? d) How many males? Seventy-seven percent (200) of those who participated in rice meetings reported that they encouraged other persons to attend meetings. Ninety-five percent (190) of these respondents reported that each of them encouraged about 12 other persons (7 females and 5 males) to attend. While males tended to encourage both males and females, females tended to encourage more females than males, perhaps reflecting traditional norms. This pattern was found in both regions, and was statistically significant by gender (F=11.29, p=.001).

Conclusions, Implications, and Recommendations

The majority of rice farmers in the Casamance were married males, having a low level of education, and belonging to the Joola ethnic group. One-third of the farmers were female and had a lower level of education than males. The fact that all extension agents in the region are males could hinder communication between extension agents and female farmers in a traditional, male-dominated culture. The fact that females had practically little or no education increases communication barriers.

Since the formal education level of farmers was very low, the extension program should focus on raising farmers’ awareness and should involve them in program development. This involvement could help stimulate self-

awakening attitude changes among farmers regarding agricultural practices that could be beneficial to them. This recommendation is supported by Diamond (1994), “… people at the local level should have major input in the extension program planning process”. (p. 76)

Participation of farmers in rice production meetings was low – only one-fourth had attended meetings organized by extension. However, those who did participate were able to recall topics discussed at meetings. They viewed extension agents associated with these meetings favorably for their technical competence and openness in discussing problems.

Radio was the most used information source for rice production. However, only 40% of the country’s population is reported to have access to personal radios. The preference for this medium suggests the potential to enlarge and enhance the use of radio through focused programming, and more rural broadcast time at times that are convenient to farmers.

Participants in rice production meetings encouraged their friends and neighbors to also attend. Under T&V, it is recommended that participating or contact farmers inform and teach at least 10 other farmers. Efforts need to be made to emphasize this aspect of the program which goes beyond encouragement. In this regard, younger farmers, who are more educated, should be involved to a greater extent in contacting their peers. In addition, female farmers should be motivated to inform as many
women as possible because they communicate more among themselves than with men.

One area of future research is the selection of contact farmers. Under T&V, these individuals are responsible to teach at least ten other people. Leadership characteristics of contact farmers with respect to diffusion of learned knowledge is an important area of investigation. Another research focus could be radio ownership in the area to determine how more people can be reached by rural radio broadcasting. A third area of investigation is the socioeconomic characteristics of those who inform others about rice meetings and the relationships that exist between the informant and the informed. This will help agents target specific categories of people in extension work.

References


COLLABORATIVE EFFORTS BETWEEN OHIO STATE UNIVERSITY AND THE FACULTY OF AGRICULTURE AT THE UNIVERSITY OF SWAZILAND

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Abstract

This article describes a sustained collaborative effort, spanning a decade, to enhance the capabilities of The Ohio State University (OSU) and the University of Swaziland (UNISWA), Southern Africa. The effort included amending the curriculum of the UNISWA Faculty of Agriculture, launching attachment programs, initiating a master’s degree program in agricultural and extension education, establishing a graduate school, and internationalizing faculty members at OSU. The primary argument is that sustained linkages between two institutions may be more effective than a series of linkage efforts between the institutions.

Introduction

In 1988, The Ohio State University (OSU) College of Food, Agricultural, and Environmental Science (CFAES), and The University of Swaziland (UNISWA) Faculty of Agriculture (FA) entered into a collaborative effort to assist each other to maximally develop human resources which would improve the quality of life and level of living of their respective institutions and to improve UNISWA FA’s teaching, research, and curricula (Masina, 1989). Recognizing the importance of the collaborative effort, a number of activities were planned, including professional faculty development workshops, programming of field attachment (internship) programs, curricular review, external examining, and improving the graduate school structure at UNISWA. The creation of the field attachment program is one of the major activities described in this article. This portion of the collaboration was funded by the United States Agency for International Development (USAID) with assistance from Pennsylvania State University (PSU). The reader will note that the collaboration has continued after the end of the USAID support.
Purpose

The purpose of this article is to describe a collaborative effort between a university from a developed country and a university from a developing country. The specific objectives are:

1. Describe the collaborative effort undertaken by OSU and UNISWA.
2. Describe the achievements of the collaborative effort.
3. Describe the lessons learned from the collaborative effort.

Methods and Data Sources

Information for this article was obtained from reports produced in the collaborative effort between the two institutions. Personal experiences of the authors are also drawn upon.

Results

The overall purpose of the collaborative effort was to enhance programmatic and faculty capabilities of the two institutions. A number of activities were planned and implemented at UNISWA to accomplish this purpose.

Activities Undertaken

The first activity was (1) “A Survey of Potential Attachment in Swaziland” designed to help identify Swazi agribusinesses that would be interested in hosting interns from the Faculty of Agriculture. This preliminary work fed into (2) a workshop on internships that was conducted at a later date (Miller, 1992). The third (3) activity was an “Evaluation Plan for the Linkage Program.” This plan helped to evaluate the attainment of objectives of the program (Diamond, 1992). The next activity (4) included the preparation of “Agribusiness Case Studies” which were presented to UNISWA faculty and agribusiness persons in a workshop. A workshop on internships (attachments) was organized by OSU and the UNISWA Department of Agricultural Education. An outcome of this workshop was the identification of conditions under which interns would participate in attachments, appropriate participation by UNISWA faculty members in the process, and appropriate evaluation measures. Another important activity (5) was an executive visit to OSU by the Dean of the UNISWA Faculty of Agriculture. A survey (6) of the horticultural needs in Swaziland was also conducted (Waters & Boyer, 1993). The next activity (7) was a Swazi Attachment Visitations to the U.S. by UNISWA agricultural faculty. The purpose of these visits was to review attachments conducted in Ohio and Pennsylvania. Procurement of teaching and farm equipment (8) was an activity that bolstered teaching and farm programming at the UNISWA FA farm and was accomplished with USAID support.

The universities also collaborated (9) to conduct an intensive six weeks study abroad program of courses, seminars, and field trips that introduced OSU students to issues of development and the culture in Southern Africa. Students became aware of the region’s unique challenges through direct exposure to African development issues. After an introductory session on Southern African history and culture, participants pursued an integrated program that combined classes on culture, society, education, agriculture, and development. The OSU has agreed to similarly host students from UNISWA.

Achievements of the Collaborative Efforts

The collaborative effort facilitated profound personal and professional relationships that continue through frequent communication and that have evolved into other creative and productive relationships. OSU faculty have served as external examiners. Faculty at OSU and UNISWA are sharing joint publications and exchange information in various ways. OSU faculty were able to incorporate experiences and information about Swaziland into their courses to help students better understand the different societies and economies, and share the culture of that country. Two teaching workshops were held in 1989 and 1990 which produced two
documents called “The Challenge to University Educators: the Teaching/Learning Process.” One document contains model lesson plans, which are not prescriptive and can be modified according to the user’s needs. The other shows and explains practical skills. Other workshops held include “Tractor Maintenance and Repair” and “Pesticide Applications.” These workshops were conducted jointly and were well attended by representatives from government ministries, university employees, private sector firms, and other entities. One output of the OSU, PSU, UNISWA, USAID linkage is “The Farmer’s Handbook”, published by the Ministry of Agriculture and Cooperatives from a cropping systems research and extension project. It is a huge volume of information on specific, basic agricultural information that is simply and clearly presented.

The teaching and curricula related workshops have resulted in faculty producing high quality lesson plans and notes for their students, and practical manuals for their laboratory classes. When UNISWA started a postgraduate program (MS) in agricultural education, OSU made a contribution in terms of curriculum ideas. An Executive Advisory Committee was formed to help assess the relevance of the curriculum to employment opportunities. Methods that could be adopted for teaching, for example, with the Ministry of Agriculture and Cooperatives Extension were introduced, and pamphlets for training in many fields – horticulture, soil science, entomology, plant pathology, and sociology – were produced. The linkage introduced the innovation of the sociology component to help researchers understand the reasons farmers did not apply certain techniques or adopt certain new methods.

The linkage program improved outreach programs at the University of Swaziland which are of value to students, employers, and the institution training prospective employees (Dlamini, Gobin & Gumbi, 1994). UNISWA, unlike OSU, does not have an arm directly tying Extension to the university. Indeed, the extension program in Swaziland exists within a Ministry of Agriculture and Cooperatives separate in the Swaziland national government from the Ministry of Education. Therefore, faculty at UNISWA often had little exposure to the public and played a minor role in service, extension or outreach. This had a detrimental effect upon their general level of credibility with important agricultural and agribusiness stakeholders in Swaziland. Improving the outreach of the University is a goal of the current administration. Touching the citizens of Swaziland will heighten their awareness of the overall utility and pragmatic nature of UNISWA, making it a more valued member of society. Citizens can see that its value is broader than just educating the enrolled student: indeed, UNISWA can extend its educational opportunities to all.

Field attachment programs were introduced to enable students to relate to the pragmatic operations of their chosen field of study, make career decisions, acquire skills of immediate relevance to the work place, and improve their job prospects after graduation which could hasten promotions. Field attachment programs benefit employers by giving them an inside track on identifying, selecting, and hiring the quality of employees they desire. Students are now placed in over 50 companies and those who have graduated are often employed by those very companies where they did their field attachments.

OSU has, for three years, provided the UNISWA Department of Agricultural Education and Extension with an external examiner to assist the department in reviewing curricula, curriculum content, rules, and regulations thus improving the quality of instruction in the department’s graduate programs. Further, OSU, in 1997, provided the University of Swaziland with a consultant to assist in reviewing and putting in place a structure, rules, and regulations for a graduate school. The University of Swaziland is presently implementing the recommendations by Miller (1997).

The UNISWA farm, through the linkage program, was able to acquire a feed mixer, prepare a farm master plan, and improve its
record keeping system. The goal of the farming operation changed from solely making money to the exclusion of student involvement, to serving as an active learning laboratory for students to acquire essential psychomotor competencies and skills important to careers in and understanding of agriculture.

A recent study by Corten and Dlamini (1996) to obtain insight about how responsive the UNISWA faculty of agriculture was to the needs of the agricultural and home economics-related industries found that most of the skill areas were important and were being addressed by the faculty of agriculture; the courses taught were regarded as important and relevant to the needs of both public and private sectors; short courses have not become a regular activity of the faculty of agriculture’s mission to fulfill the needs of industries and, therefore, the faculty of agriculture had to embark on the institutional development of short courses and in-service training; and most firms were willing to cooperate with the faculty of agriculture in exchange for research results, Swazi nation land issues, research projects, farm visits by students, irrigation management, establishment of entrepreneurial activities, and giving demonstrations to students. The study indicated that linkage programs assisted in improved cooperation between the faculty of agriculture and agro-based industries.

**Lessons Learned**

The lessons learned from these collaborative activities are applicable to many programs to help change African faculties of agriculture. Indeed they are applicable to African universities generally.

**Avoid overburdening of faculty.** Faculty are likely to resist participation in any linkage project if they see such involvement as a burden. UNISWA FA could have viewed attachment programs in this light. Active participation is required if attachments are to be part of the core of the training received by students. This means that faculty must be heavily involved in them in order to give direction to, and monitor and evaluate student performance. Full faculty participation would be more likely to occur if faculty were relieved of other teaching duties to participate in any linkage or attachment, or if new faculty and staff were hired to facilitate such programs. Further, the policy decision to initiate experiential learning programs through attachments should be made after faculty involvement in the decision making process so that a consensus is reached among the faculty. This often involves change in the status quo or current procedures and ideas about the teaching mission of the faculty. Some faculty may resist change, and the creation of a climate of faculty governance enhances the likelihood of the success of the program. This is true whether one is describing linkage programs or a specific project such as the attachment program.

**Interdisciplinary requirements.** Linkage programs involve faculty from many different disciplines just as did the specific attachment program. Attachments provide students with the opportunity to address real problems, the solutions to which require inputs from various disciplines. Thus, attachments should be structured so that they are not overly identified with any specific discipline. Upon return to campus, students should be given the opportunity to reflect on attachment experiences in an interdisciplinary setting. If this setting is not provided, students are less apt to incorporate the experiential learning experience into their formal learning environment.

**Private sector interest.** Considerable interest has emanated from the private sector supporting the linkage and attachment programs. Many institutions are willing to contribute to the professional and academic development of students and faculty. However, the private sector, in many countries, is not accustomed to contacting universities directly to request assistance from faculty, or to offer their assistance in the learning process. Thus, it is important for universities to initiate these contacts.

**Student motivation for attachment.** Students can be highly motivated to participate in attachments
if they can see how they will personally benefit. Faculty and staff need to clarify and emphasize these benefits to the students. As an attachment program matures, current students will be able to observe the benefits that accrued to past students who participated, and word will spread about the benefits, particularly those related to how an attachment program aided eventual job placement. Attachments may substitute for time spent by students in gainful employment to make money to further their education. When possible, students should be remunerated for contributions they make in their attachment settings.

**Conclusions and Implications**

The collaborative effort has enabled both institutions to better their academic programs, and the faculty to experience significant professional growth and better serve their formal students and outreach clientele groups. The professional horizons of faculty have been broadened, undergraduate and graduate programs at the UNISWA have an improved capacity for outreach programs, and teaching strategies and programming at the university farm have improved.

Sustained collaborative effort over a period of years between the two institutions has proven more effective than might have been the case if many collaborators and institutions had been involved. Sponsors of programs should note the success of this effort when they seek to develop sister-institution undertakings. This model not only produces the desired effect but a level of commitment that transcends most consulting efforts for institutional development. Profound personal and professional relationships have been established that continue through frequent communication. The relationships have evolved into creative and productive partnerships, developed training programs that can be replicated, built upon the cultures of the universities, and engaged industry through field attachment programs, advisory councils, and other groups which offer relevant employment opportunities for students. The positive climate has resulted in benefits for numerous Swazi students wanting to study at OSU, regardless of their major. Students in mathematics education and student personnel work have directly benefited because faculty at OSU have a profound personal commitment and are available to them.

Equally essential is the identification of key persons to develop and carry out the linkage. Faculty committed to making such a linkage operational must be identified. These faculty must actively seek out opportunities to perpetuate linkage activities. Initiatives cannot solely come from the university in the developed country, or when requests for proposals come from development agencies. USAID has changed its mission related to agricultural development and institution building. This change has necessitated that other potential funding agencies and innovative approaches be sought to perpetuate a linkage. Linkages based solely upon the availability of sponsored projects will surely atrophy as the availability of financial support diminishes. Faculty contribute in many ways to the creation of a supportive climate of professional trust. For example, UNISWA faculty can trust OSU faculty to assist and mentor prospective students, and OSU faculty can trust UNISWA faculty to develop learning activities for a study abroad program.

**References**


Abstract

Agricultural extension around the world is experiencing structural reforms as countries make the transition from centralized to decentralized and privatized systems. Four principal restructuring reform trends exemplify this pattern. Former Soviet Union countries are just beginning to create market-oriented agricultural systems, and can tailor their extension institutions to this philosophy. The Government of Uzbekistan, which became an independent republic in 1992, is negotiating with the World Bank to restructure its agriculture, including the development of a Rural Business Advisory Service (RBAS). The RBAS can be regarded as an innovative institutional variant of the public-private partnership trend which features commercialized information delivery preceded by government (public) subsidy. A description and analysis of the proposed Uzbek RBAS integrated into a discussion of the above reform trends is provided in the paper. Prospects and challenges of the RBAS are presented.

Introduction

Worldwide, agricultural extension is experiencing institutional changes which promise to continue into the 21st century. The transition from centrally-controlled extension systems to decentralized and privatized systems reveals four principal restructuring reform trends: (a) sub-government enhancement, (b) public-private partnerships, (c) public-sector delegation, and (d) market-oriented approaches. An exception to this phenomenon are the former Soviet Union countries in Eastern Europe and Central Asia which are only now beginning to restructure agriculture and create agricultural extension systems with a market focus.

Agricultural Restructuring and the RBAS in Uzbekistan

Uzbekistan is a relatively small country (173,000 square miles) with a population of approximately 20 million. Administratively, the country is divided into 12 viloyats (regions), 162 tumans (districts), and 118 cities and towns.

Uzbekistan has a highly developed agricultural sector. It is the fifth largest producer and the second or third largest exporter of cotton. Substantial quantities of rice, vegetables, fruits, vegetable oil, silk, leather, and wool are produced and exported to the Confederation of Independent States.

Uzbekistan, like other countries in the former Soviet Union, had a pervasive central command structure which dominated all sectors of the economy, including agriculture. To accomplish the transition from this system to a market economy, the Government of Uzbekistan, with assistance from the World Bank, is likely to introduce the Agricultural Enterprise Restructuring Program (AERP) in 1999. The main features of the program are (a) a gradual shift of government management control to the private sector through land reform whereby
government land would be leased to workers previously engaged in farming and agribusiness activities on collectives, (b) a significant change in the relationship between the government’s agricultural institutions and the rural population, shifting from supply-oriented to demand-driven information and services, and (c) a new approach of allowing and eventually enabling individuals, households, and groups to make their own decisions in their own best interests. Enactment of a new land law, a land registration system, and a business-oriented credit system should help the restructuring, which is expected to be completed within ten years.

The policy guiding agricultural restructuring is notable for several reasons. First, it advances an innovative approach to agricultural information transfer and decision-making. Second, it seeks to reduce the power of government monopolies in agriculture by promoting the development of private sector entities (entrepreneurs) rather than simply privatizing these monopolies, as has been done in Mongolia. Admittedly, the public sector still dominates, but the private sector is gradually gaining importance. Private sector values focused on entrepreneurship and a customer-orientation are slowly gathering force, and some responsibilities are being shifted to sub-government units and the emerging private sector.

At the center of Uzbekistan’s agricultural restructuring policy is the proposed RBAS, or agricultural advisory service, based on free market economics and extension principles and methodology. The RBAS is intended to provide information and advice to help workers previously employed on collective farms become entrepreneurs in farming and related agribusinesses. Information services will cover legal and policy matters, including beneficiary rights, restructuring procedures, and technical support on farming and agribusiness development. Advisory services will include farming and agribusiness planning and management, credit, business and financial planning, and marketing. Training programs and materials will be developed to support these services. RBAS beneficiaries include households and agribusinesses in collective farms, and government-sponsored or existing independent enterprises, desirous of transforming themselves into efficient, private profit enterprises.

The RBAS is to be headquartered in Tashkent, the capital of Uzbekistan, with subsidiaries in the six districts where the agricultural restructuring is initially planned to be implemented. Both the headquarters and subsidiary units will have information, advisory, and training support functions.

**Challenges for the RBAS**

As the RBAS is implemented, a number of challenges may be expected to arise which will need to be addressed. These are discussed below along with questions that are relevant to meeting them.

**Autonomy**

The RBAS is intended to be an autonomously managed public entity. Initially, it will be housed within a government agency, the Institute of Market Reform (IMR), and receive government subsidies to conduct its operations. The plan is for the RBAS to become commercialized within three years (phase one of the AERP) and begin charging for some of its services to partially cover operating costs, and to acquire new housing facilities. Relevant questions in this regard are: Is the three-year period adequate to achieve autonomy and become commercialized? Can it maintain independence from IMR’s policies, programs, and priorities while it is housed in IMR’s facility?

**Leadership, Organization, and Management**

The management and staff of the RBAS will need to show leadership and market-oriented business acumen and preparedness so that program beneficiaries get appropriate guidance and advice. In meeting this challenge: Will the leadership and staff of the headquarters RBAS have the organizational, leadership, and managerial skills to assist tuman staff in the development and distribution of information,
organization of a business advisory program, and production of appropriate training materials? Will the tuman staff, in turn, be able to help their clientele with the needed information, advice and training?

**Outreach**

Developing and implementing appropriate outreach programs for clientele is a challenging task. Significant questions which will arise in this context are: What outreach methodologies and techniques should be used, and in what kind of mix so that clientele in widespread geographic areas are efficiently and effectively reached? How can the needs of a large number of diversified farmers and agribusinesses, estimated at 123,000 families in each of the six districts, be reached by a small complement of three staff per district? To what extent should mass media be used to complement limited staff resources, and will mass media be as effective as more personal methods in alerting and informing beneficiaries about restructuring policy, legal rights, and access to initially free RBAS services? How could a strategy of assisting farmers to form farm associations in the tumans be implemented? When and how should business planning and management training programs be provided? Likewise, when and how can the tuman staff become more engaged in assisting farmers, farm associations, and agribusinesses with specific crop and livestock production, and input, credit, and marketing processes? What will be the role of information technology, including computers and computer-assisted instruction, in delivering programs?

**Infrastructure**

Ultimately, the Government of Uzbekistan will have to take appropriate measures to establish the infrastructure to cope with the developments that will flow from the RBAS, namely increased demand for agricultural production inputs, and marketing, pricing, and storage mechanisms to deal with increased production. Will it have the will and the wherewithal to do so?

The RBAS as an Institutional Variant in Agricultural Extension

It was mentioned in the opening of this paper that the RBAS may be viewed as an innovative institutional variant in an evolving framework of extension systems. Further discussion of the RBAS as an extension system is appropriately taken up within the context of structural reform strategies and innovations that have marked this evolution. Figure 1 depicts structural reforms in agricultural extension as (a) subgovernment enhancement, (b) public/private partnership, (c) public sector delegation, and (d) market-oriented approaches. Each structural reform consists of one or more innovative institutional arrangements. These arrangements are shown on a continuum from least radical to most radical forms of structural change. As depicted in Figure 1, they are public sector reinvention (1), structural deconcentration (2), structural devolution (3), power-sharing (4), delegation (5), public funding/private delivery arrangements (6), commercialization (7), and privatization (8). A ninth arrangement, public restructuring (9), is suggested for the newly independent states of Eastern Europe and Central Asia, including the Uzbek RBAS.

Sub-Government Enhancement

This term is synonymous with decentralization. It implies shifting of authority from the central (federal) government to a subgovernment, such as a state, province, district, governorate or other administrative unit. In some countries, such as Australia, Brazil, Canada, Germany, and the United States, sub-government enhancement has existed historically, in that federally constituted governments share authority for extension in varying degrees with sub-government authorities. Variations of shared authority for extension are found in federally constituted countries. These variations can be identified: (a) centralized federalism in which authority is strongly influenced by the federal government (eg. Brazil), (b) dual federalism, wherein authority is shared with subgovernments (eg. Canada), and (c) cooperative federalism characterized by shared authority among federal,
Public sector reinvention (1) occurs when extension systems revamp their programs and institute minimal fees for services, but do not radically change structurally, as in Israel and the United States, although the systems may find themselves subject to downsizing and pressure to rely on contracting out for extension services.

Structural deconcentration (2) takes place when the national government “deconcentrates” power and responsibility to branch offices. There has been some move in this direction in North African countries, such as Egypt, Morocco, and Tunisia.

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<tr>
<th>Innovations</th>
<th>Features</th>
<th>Degree of Change</th>
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<tr>
<td>Subgovernment Enhancement</td>
<td>No radical changes in structural authority, although system subject to downsizing and other pressures</td>
<td>Least Radical</td>
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<tr>
<td>1. Public sector reinvention</td>
<td>Central authority assigned to branch office(s)</td>
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<td>2. Deconcentration</td>
<td>Central authority shifted to subnational government</td>
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<td>3. Devolution</td>
<td>Authority for extension funding and delivery shared between government and farmer associations</td>
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<tr>
<td>Public/Private Partnership</td>
<td>Authority for funding and delivery delegated in large part to independent nonprofit NGOs, and to a small extent private companies.</td>
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<td>4. Partnership (“Dual” Authority)</td>
<td>Authority for funding and delivery remained with central government, but delivery responsibility shifted to private companies</td>
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<tr>
<td>Public-Sector Delegation</td>
<td>Authority for funding and delivery remained with central government, but delivery responsibility shifted to private companies</td>
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<td>5. Delegation</td>
<td>Government agency has been commercialized</td>
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<tr>
<td>Market-Oriented Approaches</td>
<td>Authority transferred entirely or in large part to private sector</td>
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<td>6. Public funding, private delivery arrangements</td>
<td>Commercialization preceded by public sector subsidy</td>
<td>Most Radical</td>
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<td>7. Commercialized</td>
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<td>8. Privatized</td>
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<td>9. Public restructuring (Public-Private Hybrid)</td>
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Figure 1. Agricultural Extension Structural Reforms
Structural devolution (3) refers to the decision of a national government to devolve power to a subgovernment, as is the case in several Latin American countries, such as Colombia and Mexico.

Public-Private Partnerships

Public-private partnerships (or power-sharing), though they tend to be overlooked in analyses that stress only decentralization and privatization strategies, often take shape in the form of dual government-farmer association arrangements. An example of a power-sharing dual arrangement (4) between the national/provincial governments and farmers associations is found in South Korea and Taiwan. In that arrangement, funding and decision-making are shared by government and farmers.

Public-Sector Delegation

Public-sector delegation of responsibility can involve shifting the burden of extension funding and delivery to a third party, including companies, farmer cooperatives, and NGOs. Delegation (5) captures the spirit of this reform strategy. The Latin American term for this strategy is “tercerizacion” involving principally nonprofit NGOs; in Africa, responsibility is most often delegated to a private company: Compagnie Francaise pour de Developpement des Fibres Textiles (French Company for Textile Development). These organizations operate as the main commodity developers and marketing agents for francophone African countries.

Market-Oriented Approaches

Market-oriented approaches also involve delegation of responsibility by the public sector to a third party. But, in this case, it is to private companies for agricultural development and various forms of extension commercialization, involving cost-sharing, fee-based arrangements, and sometimes graduated steps toward privatization. Public funding/private delivery arrangements (6) are devised when a national government decides to continue to fund extension but uses vouchers, or contractual arrangements, for private sector companies to deliver extension, as in the case of Chile, Estonia, and Hungary.

Commercialization (7) occurs when a public sector agency is reconstituted on the basis of private contractual arrangements, which may eventually, as in New Zealand, become fully privatized.

Privatization (8) is the shift of extension functions, albeit on a graduated basis, to private sector companies, as in The Netherlands.

Another innovative strategy that has recently evolved is public sector restructuring (9) following a period of control by and dependence upon an external entity. This is found in the countries of the former Soviet Union, where, in some cases, governments are seeking to restructure the previously command-driven agriculture sector. Part of these restructuring plans call for establishing agricultural and business advisory systems to help workers formerly employed on collectives to become entrepreneurs in farming and related agribusinesses.

It is too soon to identify exactly where such a strategy will lead, but it appears that the advisory services policies are likely to involve a schema that is directed toward commercialization preceded by public sector subsidy. In short, once the restructuring is completed, this strategy is unlikely to remain an operative direction among those currently dominant.

The public restructuring reform strategy and its business orientation toward “commercialization preceded by public sector subsidy” involves an institutional innovation which is different from those in non-FSU countries. The innovation suggests a public/private extension hybrid on its way to privatization. Indeed, the proposed Uzbek RBAS seeks to decentralize the burden of authority, and, at the same time, to gradually shift the financial costs to farmers and agribusinesses. This shift of responsibility to regional and district subgovernment levels and its fee-based
orientation is a kind of hybrid, one that appears to represent an institutional variant in the innovations that have resulted from the various reform strategies.

It is notable that all nine types of innovations underscore the diminution of national or central government control of extension. The delivery function of public sector extension services in particular is being reduced as more countries augment subgovernment or private sector responsibility for extension delivery, or contract out for these services. As noted, various countries have decided to hire private companies to reach agricultural producers. In such cases, the national government pays for, but does not deliver extension services. This division of public/private as to who pays/who delivers is graphically illustrated in Rivera and Cary (1997), Kraft (1997), and further revised in Cary (1998). Needless to say, the prevailing policy-driven public sector extension decentralization and privatization reform trends are loaded with political and practical meaning and deserve further analysis.

Summary

An innovative extension system is poised for development in Uzbekistan: the Rural Business Advisory Service (RBAS). The RBAS would foster both agricultural information transfer and business advice. The innovations embodied in the system concept and action plan differ from other extension system innovations. As such, the RBAS represents an emergent extension variant. This innovative system promises to integrate farmers and associated agribusiness workers on collective farms into a market-oriented agricultural economy. To succeed, however, the system will require considerable government commitment, institutional leadership, and staff interest to develop fully this innovative extension variant.

References


Endnotes:

1. At present (1998), The Netherlands Government is obliged to buy specific extension programs unilaterally from the DLV (Dienst Landbouwvoorzicht) private company. But by the year 2000 all government programs will be open to public tender procedures and the DLV will then have to bid along with others for government contracts.

2. Subgovernments at the state level are also being diminished as regards extension delivery. In the United States, the curtailment of the subgovernment state role appears to be occurring at different rates in different states. Wolf notes that: “A privatization gradient can be observed across higher and lower competition counties within each state.” He finds that in sites with a strong private sector and where competition is high, Extension is less active and relied upon less, independent crop consultants are more active, and dealers are more fully engaged in service delivery and promotion (Wolf, 1998:167). Boehje (1998:34) states that: “Growing competition by private sector providers and decreasing budgets of public sector providers of information will require significant reassessment of the role of the public sector in the information markets.” Bennett (1994) argues that the public sector should not try and compete with the private sector but allocate resources to areas where private sector investment is inadequate.
TECHNOLOGY ATTRIBUTES AND ADOPTION: IMPROVING THE EFFECTIVENESS OF INDONESIAN SMALLHOLDERS’ RUBBER RESEARCH

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Abstract

The purpose of this study was to find out the influence of attributes of rubber technologies on adoption in Indonesian rubber smallholdings. A sample of 257 respondents from three groups of stakeholders was studied for their opinions regarding technology attributes, knowledge, and adoption of recommended technologies, and reasons for non-adoption. Data were gathered using a mailed questionnaire, and individual and group interviews. It was concluded that some rubber research technologies are inappropriate for smallholders’ conditions because technological attributes can impede adoption. Follow-up pilot participatory research projects were developed which can enable rubber research providers to improve the appropriateness of recommended technologies.

Introduction

Adoption studies commonly regard farmers’ attributes as a major constraint in the adoption of agricultural innovations (Rogers, 1983). Researchers are also increasingly recognizing that the adoption of agricultural innovations is often delayed because a majority of farmers perceive them as impractical or unprofitable (Chambers, Pacey & Thrupp, 1990; Haerkort, Kamp & Waters-Bayer, 1991; Hildebrand, 1982). In spite of this, technological attributes are still only rarely considered as a factor affecting the adoption process. This position has been reflected in research on Indonesian rubber smallholdings (Chamala, Findlay & Western, 1985; Gouyon & Nancy, 1989; Supriadi & Anwar, 1988). Since the 1970s, the Indonesian government has launched rubber development projects to encourage farmers to adopt recommended technologies, but to date, only a minority of smallholders actually use them (Cottrell, 1990; Gouyon & Nancy, 1989; Supriadi et al., 1992). Hence, rubber smallholdings are generally far behind the larger estates in yield, productivity, and quality. State and private plantations were reported to yield an average of 1,295 kg/ha and 984 kg/ha respectively, while the yield on smallholdings was only 512 kg/ha (DGE, 1992).
Purpose

The purpose of this study was to determine the influence of attributes of rubber technologies on adoption in Indonesian rubber smallholdings.

The specific objectives were:

1. To assess the opinions of stakeholders regarding technological attributes of rubber technologies.

2. To assess the knowledge and adoption of the recommended rubber technologies by selected smallholders.

3. To identify reasons for non-adoption of the recommended technologies.

Based on the findings, two pilot projects were undertaken in the later stages of this study using participatory approaches.

Methodology

The study was carried out in three stages. The first stage was designed to enable a range of stakeholders, including policy/decision makers at district, provincial, and national levels, and extension personnel, to assess the attributes of rubber technologies and to give their opinions on present rubber research and development approaches.

The second stage was designed to verify first-stage results, and to implement two pilot projects using participatory approaches. Reflections on the pilot projects were the focus of the third stage.

Stage 1 Respondents: Estate Officers and Extension Personnel

Three main rubber producing provinces (North Sumatra, Jambi, and South Sumatra), accounting for 48% of the total smallholding area in rubber, were purposively selected from Indonesia’s 20 rubber-producing provinces (DGE, 1995). From each of the selected provinces, three major and easily accessible rubber-producing district offices for estate crops were chosen. The Office of the Directorate General for Estate Crops was also included. All heads and sub-heads of the selected estate crops offices were chosen because of their involvement in the rubber smallholding sector and their roles in policy and decision making. One hundred and eighty mailed questionnaires were sent to this group and 110 (61%) were returned.

All extension personnel (86) involved in rubber smallholding development in the chosen districts were also surveyed. Fifty-four questionnaires (63%) were returned.

A survey was used to collect data from these groups of respondents. The survey was carried out between August and December, 1995. A response rate of 62% is considered sufficient to minimize the possibility of non-response bias (Babbie, 1990; De Vaus, 1995).

Stage 2 Respondents: Farmers

Due to time and travel constraints the second stage of the study was restricted to South Sumatra and Jambi provinces. Musi Banyuasin District, South Sumatra Province, and Batanghari District, Jambi Province, were selected as they are the main rubber-producing districts in these provinces. Five main rubber-producing villages from the two districts were chosen to represent both accessible and remote areas. Farmers who had both immature and mature rubber trees in these villages were included in the sample to study the adoption of both pre-harvest and post-harvest technologies.

The respondents were chosen according to their availability from lists provided by village chiefs and farmer leaders. Availability sampling is a common non-probability technique (De Vaus, 1995). Using this approach, 93 farmers were selected. Individual and group interviews, and direct observations were employed for this stage. The survey was carried out during March and April, 1996.
Instrumentation

Two different questionnaires were used to collect data from (a) estate officers and extension personnel, and (b) farmers. Procedures to ensure the validity and reliability of the questionnaires were: (a) researchers from three rubber research stations in South Sumatra, Bogor, and Central Java assisted in selecting the most prominent rubber research outcomes and the recommended rubber technologies for smallholders, (b) the draft questionnaires were pre-tested with research and policy officers, extension personnel, and farmers, and were then modified, (c) multiple indicators (composite measures) were used to measure attitudes or opinions; and (d) Cronbach’s alpha test was used to assess the reliability of opinion measures. The alpha coefficient was 0.57. Henderson, Morris and Fitz-Gibbon (1987) state that in the case of attitude measurement, a reliability coefficient of above 0.70 is desirable, but lower coefficients are tolerated. This tolerance was used to justify reliability of the opinion scale measures of the study.

Findings

Opinions Regarding Attributes of Rubber Technologies

The opinions of respondents regarding attributes of rubber technologies were determined by their level of agreement with (a) selected attribute statements, and (b) statements concerning the difficulty of implementing selected technologies.

The extent to which estate officers, extension personnel, and farmers agreed with five rubber technologies attribute statements is shown in Table 1. Respondents’ opinions on statement 1 indicate a belief that rubber technologies could benefit smallholders. This positive view may be due to a belief held by respondents that rubber technologies can increase productivity (statement 2). On the other hand, respondents, particularly farmers, had negative opinions of other attributes, i.e., compatibility with farmers’ conditions (statement 3), high cost (statement 4), and difficulty or technical complexity (statement 5).

Table 2 shows the means and ranges of the opinion scores of respondents summarized for all five attributes. Kruskal Wallis test for differences in opinions was statistically significant at $p < .001$. Farmers had the least favorable opinions, followed by extension personnel and then estate officers.

When extension personnel and officers were asked to give their opinion about the difficulty that smallholders would face in applying 30 rubber research technologies, the majority of officers (>50%) agreed that 12 technologies were difficult to apply. However, a majority of officers thought that 8 of the 30 technologies were difficult. By contrast, a majority of extension personnel (>50%) felt that 10 technologies were difficult to apply. However, a majority of extension personnel felt that none of the 30 technologies was easy to apply on rubber smallholdings (Table 3).

Knowledge and Adoption of Recommended Rubber Technologies

Fifteen pre-harvest and two post-harvest technologies, and one socio-economic practice are widely recommended for smallholders (Gozali, Supiradi, Hendratno, Amypalupy & Santosa, 1992). Farmers were asked if they knew of and had adopted these practices. Table 4 shows that 56% of the farmers, overall, knew about all 18 practices but only 26% had adopted them. There was considerable variation in farmers’ knowledge of specific practices. The proportion of farmers having knowledge of the several practices ranged from 95.7% for poly budded stump to 13.9% for chemical disease control. Over 80% of farmers knew the four technologies of budded and polyutherene budded stump, manual weed control, and types of fertilizers. Farmers knew that budded (budgrafted rubber) stump and fertilizers increase the yield of rubber, while manual weed control is already practiced by most smallholders.
Table 1.

Opinions of Respondents Regarding the Attributes of Rubber Technologies for Smallholders.

<table>
<thead>
<tr>
<th>Attributes of rubber technologies</th>
<th>Respondent(^a)</th>
<th>Level of Agreement(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SD + D</td>
</tr>
<tr>
<td>1. Present practices of farmers are generally more beneficial than rubber research technologies.</td>
<td>Estate Officers</td>
<td>64.3</td>
</tr>
<tr>
<td></td>
<td>Extension Personnel</td>
<td>56.0</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>65.6</td>
</tr>
<tr>
<td>2. Rubber research technologies can generally increase the productivity of rubber farming.</td>
<td>Estate Officers</td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td>Extension Personnel</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Present practices of farmers are generally more suitable compared to rubber research technologies.</td>
<td>Estate Officers</td>
<td>34.7</td>
</tr>
<tr>
<td></td>
<td>Extension Personnel</td>
<td>34.0</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>35.5</td>
</tr>
<tr>
<td>4. More capital is generally required to apply rubber research technologies.</td>
<td>Estate Officers</td>
<td>19.4</td>
</tr>
<tr>
<td></td>
<td>Extension Personnel</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>0.0</td>
</tr>
<tr>
<td>5. Rubber research technologies are generally difficult for farmers to apply.</td>
<td>Estate Officers</td>
<td>42.9</td>
</tr>
<tr>
<td></td>
<td>Extension Personnel</td>
<td>34.0</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>7.5</td>
</tr>
</tbody>
</table>

\(^a\) Number of respondents: Estate Officers=98, Extension Personnel=50, Farmers=93

\(^b\) Level of Agreement: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree

Table 2.

Opinion Scores of Respondents Regarding the Attributes of Rubber Technologies for Smallholders.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Mean score</th>
<th>Range(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>14.42</td>
<td>10 – 19</td>
</tr>
<tr>
<td>Extension Personnel</td>
<td>15.56</td>
<td>12 – 19</td>
</tr>
<tr>
<td>Officers</td>
<td>16.10</td>
<td>11 – 21</td>
</tr>
</tbody>
</table>

\(^a\) Possible range : 5 least favorable; 25 most favorable
### Table 3.

**Extent of Agreement by Estate Officers and Extension Personnel that Rubber Technologies are Difficult for Smallholders to Apply.**

<table>
<thead>
<tr>
<th>Technology cluster</th>
<th>Respondent</th>
<th>Level of agreement&lt;sup&gt;b&lt;/sup&gt;</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Disagree</td>
<td>Neutral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD + D</td>
<td>N</td>
</tr>
</tbody>
</table>

#### A. Clone
1. Recommended clones for large scale planting.  
   - Estate Officers: 59.3%  
   - Extension Personnel: 45.7%
2. Resistant clones to *Corynespora* leaf fall disease.  
   - Estate Officers: 51.0%  
   - Extension Personnel: 30.4%
3. Resistant clones to *Colletotrichum* leaf fall disease.  
   - Estate Officers: 55.3%  
   - Extension Personnel: 26.1%

#### B. Planting Material
4. Young budded technique  
   - Estate Officers: 7.4%  
   - Extension Personnel: 21.7%
5. Green budded technique  
   - Estate Officers: 23.2%  
   - Extension Personnel: 34.7%
6. Brown budded technique  
   - Estate Officers: 60.0%  
   - Extension Personnel: 41.3%
7. Marcotting propagation method  
   - Estate Officers: 14.8%  
   - Extension Personnel: 21.7%
8. Budded stump in polybag  
   - Estate Officers: 49.5%  
   - Extension Personnel: 39.1%
9. Multi-tree planting system  
   - Estate Officers: 40.0%  
   - Extension Personnel: 39.1%

#### C. Manuring
10. The use of salt (NaCl) as KCl substitution  
    - Estate Officers: 18.3%  
    - Extension Personnel: 37.0%
11. The use of rock phosphate as TSP substitution  
    - Estate Officers: 50.6%  
    - Extension Personnel: 32.6%
12. High frequency of fertilization  
    - Estate Officers: 19.4%  
    - Extension Personnel: 34.8%

#### D. Disease Control
13. Integrated control of *Colletotrichum* leaf disease  
    - Estate Officers: 20.7%  
    - Extension Personnel: 19.6%
14. Integrated control of *Corynespora* leaf disease  
    - Estate Officers: 38.1%  
    - Extension Personnel: 21.7%
15. *Oidium* leaf disease control by using sulphur  
    - Estate Officers: 41.4%  
    - Extension Personnel: 23.9%
Table 3 (cont.)

<table>
<thead>
<tr>
<th>Technology cluster</th>
<th>Respondent(^a)</th>
<th>Level of agreement(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Disagree SD + D</td>
</tr>
<tr>
<td>16. The use of prochloraz and chlorotalonil fungicide</td>
<td>Estate Officers</td>
<td>9.8</td>
</tr>
<tr>
<td>17. Controlling Brown Bast disease by scraping the dry bark.</td>
<td>Extension Personnel</td>
<td>17.4</td>
</tr>
<tr>
<td>18. Biological control of White Root Disease by using <em>Trichoderma k.</em></td>
<td>Estate Officers</td>
<td>48.9</td>
</tr>
<tr>
<td>19. Control of White Root Disease by using triadimenol</td>
<td>Extension Personnel</td>
<td>30.4</td>
</tr>
<tr>
<td>20. Control of White Root Disease by using sulphur</td>
<td>Estate Officers</td>
<td>47.8</td>
</tr>
<tr>
<td>21. Rearing sheep under rubber trees</td>
<td>Extension Personnel</td>
<td>30.4</td>
</tr>
<tr>
<td>22. Food-based cropping system for increasing farming income</td>
<td>Estate Officers</td>
<td>56.5</td>
</tr>
<tr>
<td>23. Periodical tapping system</td>
<td>Extension Personnel</td>
<td>45.7</td>
</tr>
<tr>
<td>24. Hypodermic tapping system</td>
<td>Estate Officers</td>
<td>46.6</td>
</tr>
<tr>
<td>25. Upward tapping system</td>
<td>Extension Personnel</td>
<td>37.7</td>
</tr>
<tr>
<td>26. The use of mini creeper for improving rubber quality</td>
<td>Estate Officers</td>
<td>66.7</td>
</tr>
<tr>
<td>27. Technology for small scale rubberwood preservation</td>
<td>Extension Personnel</td>
<td>35.5</td>
</tr>
<tr>
<td>28. Processing of rubber seeds into rubber seed oil</td>
<td>Estate Officers</td>
<td>53.4</td>
</tr>
<tr>
<td>29. DRC determination using microwave and creeper machine</td>
<td>Extension Personnel</td>
<td>31.8</td>
</tr>
<tr>
<td>30. Process of concentrated latex using creaming method</td>
<td>Estate Officers</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>Extension Personnel</td>
<td>16.3</td>
</tr>
</tbody>
</table>

\(^a\) Number of respondents ranged from 90 to 96 for estate officers and 43 to 46 for extension personnel

\(^b\) Level of Agreement: SD=Strongly Disagree, D=Disagree, N=Neutral, A=Agree, SA=Strongly Agree
Table 4 shows that adoption rates of recommended technologies are much lower than knowledge levels. The overall adoption rate for all practices was 28%. Only four basic technologies – budded stump, rubber intercrops, types of fertilizers and manual weed control – had been adopted by over 40% of the farmers. Adoption rates for other technologies were lower.

Knowing about the technologies does not necessarily mean that farmers will adopt them. Knowledge may influence adoption (Dixon, 1992; Rogers, 1983), but other factors also influence the farmer’s decision to adopt an innovation. The study attempted to uncover these factors.

Table 4.

<table>
<thead>
<tr>
<th>Rubber Technologies</th>
<th>Knowing</th>
<th>Adopting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1. Budded stump</td>
<td>85</td>
<td>91.4</td>
</tr>
<tr>
<td>2. Polyutherene budded stump</td>
<td>89</td>
<td>95.7</td>
</tr>
<tr>
<td>3. Clone GT1</td>
<td>34</td>
<td>37.6</td>
</tr>
<tr>
<td>4. Planting distance</td>
<td>53</td>
<td>56.9</td>
</tr>
<tr>
<td>5. Based fertilizer</td>
<td>45</td>
<td>48.4</td>
</tr>
<tr>
<td>6. Rubber intercrops</td>
<td>43</td>
<td>46.2</td>
</tr>
<tr>
<td>7. Types of fertilizer for rubber</td>
<td>80</td>
<td>86.0</td>
</tr>
<tr>
<td>8. Recommended doses of fertilizers</td>
<td>20</td>
<td>21.5</td>
</tr>
<tr>
<td>9. Manuring frequently</td>
<td>48</td>
<td>51.6</td>
</tr>
<tr>
<td>10. Manual weed control</td>
<td>88</td>
<td>94.6</td>
</tr>
<tr>
<td>11. Herbicide</td>
<td>65</td>
<td>70.2</td>
</tr>
<tr>
<td>12. Chemical disease control</td>
<td>13</td>
<td>13.9</td>
</tr>
<tr>
<td>13. Tapping system</td>
<td>40</td>
<td>43.0</td>
</tr>
<tr>
<td>14. Angle of cut</td>
<td>38</td>
<td>40.9</td>
</tr>
<tr>
<td>15. Depth of cut</td>
<td>50</td>
<td>53.8</td>
</tr>
<tr>
<td>16. Formic acid for rubber processing</td>
<td>54</td>
<td>58.1</td>
</tr>
<tr>
<td>17. Thin slab</td>
<td>49</td>
<td>52.7</td>
</tr>
<tr>
<td>18. Group marketing system</td>
<td>45</td>
<td>48.4</td>
</tr>
<tr>
<td>All technologies</td>
<td>56</td>
<td>60.2</td>
</tr>
</tbody>
</table>

Reasons for Not Adopting Recommended Rubber Technologies

Finance, i.e., lack of funds and profitability was the basic reason given by farmers for not adopting a number of recommended rubber technologies (Table 5). Other reasons for not adopting some technologies were (a) the technologies were difficult to implement as the farmers needed to master new skills or new management practices, (b) materials were not available at the farm level or were difficult to obtain, and (c) labor to implement the technologies was inadequate.

Table 4.

Farmers Knowing and Adopting Recommended Rubber Technologiesa.

<table>
<thead>
<tr>
<th>Rubber Technologies</th>
<th>Knowing</th>
<th>Adopting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1. Budded stump</td>
<td>85</td>
<td>91.4</td>
</tr>
<tr>
<td>2. Polyutherene budded stump</td>
<td>89</td>
<td>95.7</td>
</tr>
<tr>
<td>3. Clone GT1</td>
<td>34</td>
<td>37.6</td>
</tr>
<tr>
<td>4. Planting distance</td>
<td>53</td>
<td>56.9</td>
</tr>
<tr>
<td>5. Based fertilizer</td>
<td>45</td>
<td>48.4</td>
</tr>
<tr>
<td>6. Rubber intercrops</td>
<td>43</td>
<td>46.2</td>
</tr>
<tr>
<td>7. Types of fertilizer for rubber</td>
<td>80</td>
<td>86.0</td>
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<tr>
<td>8. Recommended doses of fertilizers</td>
<td>20</td>
<td>21.5</td>
</tr>
<tr>
<td>9. Manuring frequently</td>
<td>48</td>
<td>51.6</td>
</tr>
<tr>
<td>10. Manual weed control</td>
<td>88</td>
<td>94.6</td>
</tr>
<tr>
<td>11. Herbicide</td>
<td>65</td>
<td>70.2</td>
</tr>
<tr>
<td>12. Chemical disease control</td>
<td>13</td>
<td>13.9</td>
</tr>
<tr>
<td>13. Tapping system</td>
<td>40</td>
<td>43.0</td>
</tr>
<tr>
<td>14. Angle of cut</td>
<td>38</td>
<td>40.9</td>
</tr>
<tr>
<td>15. Depth of cut</td>
<td>50</td>
<td>53.8</td>
</tr>
<tr>
<td>16. Formic acid for rubber processing</td>
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<td>58.1</td>
</tr>
<tr>
<td>17. Thin slab</td>
<td>49</td>
<td>52.7</td>
</tr>
<tr>
<td>18. Group marketing system</td>
<td>45</td>
<td>48.4</td>
</tr>
<tr>
<td>All technologies</td>
<td>56</td>
<td>60.2</td>
</tr>
</tbody>
</table>

a Number of farmers (N)=93.
Table 5.

Main Reasons Reported by Farmers for Non-adoption of Recommended Rubber Technologies.

<table>
<thead>
<tr>
<th>Main reason</th>
<th>Rubber Technology</th>
<th>Percent of respondents indicating reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>No funds available</td>
<td>Herbicide</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Polyutherene budded stump</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Manuring frequency</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Clone GT1</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Recommended doses</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Budded stump</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Type of fertilizer</td>
<td>53</td>
</tr>
<tr>
<td>Unprofitable</td>
<td>Rubber intercrops</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Tapping systems</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>Thin slab</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>Planting distance</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Formic acid</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Angle of cut</td>
<td>62</td>
</tr>
<tr>
<td>Difficult to implement</td>
<td>Group marketing systems</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Depth of cut</td>
<td>77</td>
</tr>
<tr>
<td>Materials are not available</td>
<td>Chemical disease control</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>Based fertilizer</td>
<td>55</td>
</tr>
<tr>
<td>Not enough labor</td>
<td>Manual weed control</td>
<td>65</td>
</tr>
</tbody>
</table>

**Discussion**

The study shows that all three groups of respondents, namely estate officers, extension personnel, and farmers believed rubber technologies have the potential to benefit smallholders, but are of the view that some attributes of these technologies are inappropriate for smallholders’ conditions, and, as a result, have impeded adoption. Evidence from adoption studies supports the conclusion that one of the most influential factors in the adoption process is the technological attributes of innovations (Singh, 1981; Wadsworth, 1990). Lindner (1985) maintained that the real reason for non-adoption of agricultural innovations in developing countries was inappropriate technology. In respect to small farmers, Hildebrand (1982) argued that the resistance by small farmers to adoption is not because they are ignorant, traditional or conservative, but because technology appropriate to their needs and conditions is not available.

A 1992 study in South Sumatra provided support for this notion that appropriateness of technology favorably influences adoption. Supriadi et al (1992) found that four rubber technology practices (holing, pruning, branch induction, and planting distance) were widely adopted by smallholders, because the attributes associated with these technologies made it easy for farmers to implement them individually.
Discussion about the ideal attributes of rubber technologies for smallholders has been continuing for over a decade. In 1984, Barlow and Jayasuriya (1984) suggested the need for developing intermediate rubber technologies for smallholders which should mimic the characteristics of traditional practices, be inexpensive to implement, and require fewer rather than more additional facilities and techniques. Gouyon (1992) suggested that in generating rubber technologies for smallholders, different rankings of technologies and choices of techniques were needed.

In an effort to involve research consumers, a number of research and development agencies have successfully applied participatory research approaches to generate appropriate technologies to resolve problems of the intended beneficiaries (Chamala, 1995; Pretty, 1997). Following this strategy, a follow-up study to the one reported in this paper has been undertaken (Supriadi & Chamala, 1998). Two pilot action research projects in that study investigated (a) the low quality and price of raw rubber materials in two villages, and (b) the lack of high-yielding rubber planting materials in one village.

The pilot projects have yielded significant outcomes in achieving a better understanding of the causes of the problems, and producing potential solutions and action plans. Important lessons learnt from these projects include: (a) participatory approaches have the capacity to improve the effectiveness and efficiency of rubber research, development, and extension efforts; (b) participatory approaches help to eliminate psychological and communication barriers and develop effective relationships among the involved partners; (c) research clients are more committed to research outcomes as a result of their active participation and therefore more likely to adopt the technologies; (d) lack of planning and institutional support, inadequate skills and conflicting opinions among individuals are constraints which could detract from the effectiveness of participatory approaches.

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TRENDS IN IRISH AGRICULTURE: IMPLICATIONS FOR EXTENSION AND RURAL DEVELOPMENT

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Abstract

The structure of Irish agriculture is changing, pushed largely by European Union (EU) policies and changing world market situations. The adjustment process is seriously affecting the viability of many rural areas, with an unprecedented exodus of people from these areas leaving societies with weak demographic structures and low levels of services. Farm households in Ireland currently obtain just over 50% of their household income from farming. Direct payments from the EU now form a significant component of farm income. The adjustments to agriculture are occurring at a time when the current model of competitiveness is under increasing scrutiny, and food safety is becoming a major concern. The Irish agricultural extension service has restructured itself to meet these changing circumstances. Many of its services, particularly advisory services, are provided for a fee. The focus on rural development is increasing and agencies servicing this need are beginning to emphasize farm households as a relevant target group for their services.

Introduction

The purpose of this paper is to outline the importance of agriculture in the Irish economy, to detail the adjustment process that is taking place, particularly regarding income levels and sources of income of farm households. It also examines the implications of these adjustments for the extension service and for the future development of rural areas.

Within the EU (European Union) Ireland is one of the most rural and agrarian based societies. Excluding the Dublin area over 60% of the population live in rural areas. Almost 11% of the workforce is directly employed in agriculture, and primary agriculture contributed 7% to the gross domestic product in 1995. The agri-food sector accounts for 14% of employment, 14% of output and 18% of total exports (DAFF, 1997). Ninety percent of Irish farms are family owned and run.

The Future of Rural Societies (Commission of the European Communities, 1988) examined in detail the role that rural areas in the EU should play in the broader development context, and how agriculture was contributing to this development. It clearly identified the need for more balanced rural development. Many peripheral areas of the EU, like Ireland, where agriculture is the main industry, are suffering from severe rural decline arising largely from low farm incomes and the lack of off-farm employment (Phelan, 1994). The number of dairy, drystock and tillage farms has gone down, while the average scale of operation and level of production efficiency of many farms has increased. In 1980, there were 223,000 farms; this figure decreased to 159,000 in 1993 (Teagasc, 1996). Dairying, one of the most
profitable enterprises, has on the one hand seen a reduction in the numbers of farmers with cows, from 144,000 in 1973 to 41,000 in 1994, while on the other hand herd size has increased from just under 20 cows in 1985 to over 27 in 1995 (DAFF, 1995; Moss, Phelan, Markey, McHenry & Caskie, 1991). Seventy five percent of rural districts in Ireland lost population between 1986 and 1991 (Commins, 1991). From a farming perspective, the poorer parts of the country suffered the most. In 1992, common agricultural policy reforms were implemented, but have done little in addressing the core problems of rural areas.

**Farm Household Incomes in Ireland**

The Household Budget Survey (HBS) is conducted every seven years by the Central Statistics Office (CSO), the latest being for 1994-95. This survey is representative of all farm households whose self-reported principal occupation of the head of household is farming (12% of the workforce in 1995). The HBS classifies income of farm households under three sources; income from farming activities (farming income); income earned by a member of the household through an off-farm job, investments or pensions, and property income (other direct income); and income from state pensions, social welfare, and children’s allowances (transfer payments). Farming income accounted for 53% of the total income of farm households in 1994-95, other direct income 35%, and transfer payments 12% (Table 1). It is important to mention that the contribution of income from farming to gross household income has declined from 70% in 1973 to its current level of just over 50%. Household income in real terms was 18% higher in 1994-95 than 1987, and 40% higher than 1980. However, this must be interpreted in the context of a large exodus from farming over the period.

Table 1 also shows that the biggest factor in increasing incomes from 1987 to 1994-95 was other direct income, which rose 45% over 1987. Income from farming has increased significantly from 1980 to 1994-95. However, farm incomes in 1994-95 were almost similar to those obtained in 1973, the year Ireland joined the European Union. Farming systems also significantly influence incomes, with dairying being four times more profitable as a farm enterprise than cattle farming. Cattle farmers, who account for 50% of Irish farmers, had average gross household incomes in 1994-95 of £14,560. Income from farming contributed just over one-third of this income.

Table 1.

**Contribution of Different Sources of Income to Annual Gross Income of Farm Households.**

<table>
<thead>
<tr>
<th>Income Source</th>
<th>1973a</th>
<th>1980a</th>
<th>1987a</th>
<th>1994-95a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farming income£</td>
<td>9,471</td>
<td>7,719</td>
<td>8,498</td>
<td>9,938</td>
</tr>
<tr>
<td>%</td>
<td>70.12</td>
<td>58.46</td>
<td>54.16</td>
<td>53.48</td>
</tr>
<tr>
<td>Other direct income£</td>
<td>2,577</td>
<td>3,472</td>
<td>4,434</td>
<td>6,474</td>
</tr>
<tr>
<td>%</td>
<td>19.08</td>
<td>26.29</td>
<td>28.26</td>
<td>34.84</td>
</tr>
<tr>
<td>Transfer payments£</td>
<td>1,460</td>
<td>2,014</td>
<td>2,759</td>
<td>2,169</td>
</tr>
<tr>
<td>%</td>
<td>10.80</td>
<td>15.25</td>
<td>17.58</td>
<td>11.68</td>
</tr>
<tr>
<td>Gross income£</td>
<td>13,508</td>
<td>13,205</td>
<td>15,693</td>
<td>18,582</td>
</tr>
</tbody>
</table>

Source: Household Budget Survey; (£, 1995=base)

Includes direct payments (EU payments which are not market related i.e. area aid payments, payments per head of livestock, and payments for maintaining the environment)
**Income Trends**

The above information shows that other earned income is a very important source of income for farm households. However, the question often arises as to the type of households that are obtaining this income: Is it the richer or poorer households? Figure 1 shows that households which are obtaining high gross household incomes are doing so by combining high farm incomes with high incomes earned outside the farm. Phelan and Kinsella (1994) showed that these high incomes were strongly associated with a working spouse. The low income problem is not unique to farm households; in fact the 1994-95 HBS shows that rural non-farm households have, on average, lower incomes than their farming counterparts (Figure 1).

**Direct Payments**

Since the reform of the common agricultural policy in 1992, direct payments (EU supports which are not market related) have played an increasing role in supporting farm income. By the end of 1997 direct payments to Irish farmers had reached over £1,000 million (Teagasc, 1997). There is considerable debate as to who receives these payments. The top 30% of farmers, in terms of utilized agricultural area, received 80% of direct payments paid to Irish farmers in 1995. The extent to which direct payments are compensatory payments, or contain a “public good” component (something which society wants but which cannot be supplied commercially) is also part of the debate. The long-term commitment to direct payments given EU expansion to the East and Ireland’s currently booming (“Celtic Tiger”) economy is also a consideration. The boom in the economy has not solved the low income problems of farm households which have again been highlighted by a number of recent studies (Commins, 1996; Moss et al., 1991; Phelan & Markey, 1994). Many commentators feel that better targeting of direct payments towards low income farmers is required.

**The Role of Extension Services**

Considerable changes have occurred in the methods of operation and in the goals of advisory services across the EU over the last 15 years. In the 1960s the push was for increased production through the adoption of new technology and improved practices. This was encouraged by generous development grants which were taken up by the better resourced farmers. The late 1970s and 1980s saw efforts to curtail production and a concentration by advisory services on efficiency. Severe budgetary constraints resulted in a significant reduction in the numbers of advisers and the introduction of fees for advisory services.

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**Figure 1: Gross Income, Farm Income and Other Income Classified by Gross Household Income Decile (£/Week, 1994-95).**

The nature and target audience of advisory services changed somewhat as charging for services became part of the method of operation. Farmers who could pay and who were willing to pay were targeted as clients. The 1990s brought further changes as farmers’ incomes, particularly in the more peripheral areas (areas remote from mainland Europe), relied more on direct payments. The bureaucracy associated with obtaining these payments introduced a “paper” enterprise on many farms. To obtain payments farmers had to complete complex application forms, a service which was quickly supplied by the advisory service, and others, for a fee. In 1995, Teagasc reorganized the structure of the Irish extension service to deal with the changing circumstances in farming and in rural areas. Three different types of service were established: a commercial service; a farm viability service; and a rural enterprise service (Teagasc, 1995). Teagasc’s increasing focus on income generation, and its curtailment of staff expansion, combined with the increased demand by farmers for support in obtaining direct payments, have meant severe difficulties for the extension service to provide an effective viability service to an increasing number of farmers whose income is at risk and who are being marginalized.

In Ireland, advice to farmers and rural communities is not limited to the state advisory service, Teagasc. The agribusiness sector has for over 20 years offered technical advice to their farmer customers free of charge. In conjunction with Common Agricultural Policy reform, moneys were made available by the EU for community-led rural development initiatives, whose main aim is to diversify the rural economy. This has led to the establishment of several agencies and groups with a rural development focus. These groups see low income farm households as a relevant target audience for their services. With the decoupling of supports from production, and with farming contributing a decreasing percentage over time to household income, technical production advice for many households has become less important. A wide range of skills is needed to provide effective advice in the broader rural development context. As extension commercializes, the need for high levels of technical expertise increases. This raises questions as to the ability of this type of system to service the needs of farmers who are less resourced and who must seek viability through combining farming with other activities in the broader rural economy. In addition, the tendency for increased part-time farming further marginalizes farmers from extension which operates during “normal” working hours.

Conclusion

Reflection on the above analysis raises questions as to the type of society we want in rural areas and the role which agriculture should play in shaping that society. The gradual concentration of resources in fewer and fewer people, and the consequences of this trend for both rural and urban people have not received enough debate. The effects of intensification on the environment, animal welfare, and food safety are beginning to elicit a response among concerned groups and consumers. How far can countries go in following this approach? This approach means that as the cost/price squeeze tightens one must expand output to compensate. Thus units must get bigger and bigger and continually squeeze out the less resourced “smaller” and “less efficient” producer. The system of supports which are in place strongly underpins this system.

The viability of a large sector of Irish farming is at risk. There is need for substantial support to be targeted at this sector if irreversible change to the nature of several rural areas is to be avoided. Farmers are a critical component of the Irish rural ecosystem. While there has been much debate and concern about the problem from a policy point of view, meaningful policies have not emerged. The extension service is dealing with a reducing target audience, and at the same time is facing increased competition from other agencies in the broader context of rural development. The future of advisory services and training institutions will depend on how they position themselves to deal with these changing realities. On the one hand, there will
be the continued push for high levels of technical expertise, which will have to survive commercially, while on the other, significant moneys are likely to be available for public good type services to support the development and diversification of less intensive, non-commercial farms, and the broader rural economy. Can extension services successfully fulfill both functions? Extension services that are slow to adapt or who choose the wrong direction may, just like their farmer clients, find themselves marginalized and of little relevance to future developments.

References


COMMENTARY

BUILDING A PARADIGM OF NONFORMAL EDUCATION ADMINISTRATION:
FOCUS ON COMPETENCIES

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Abstract

The literature on administration, management, and leadership is extensive. Few sources, however, address the competencies (skills, knowledge, and attitudes) of effective administrators in nonformal education. None of the sources put those competencies in a scheme that is simple yet comprehensive. The author has developed a paradigm of nonformal education administration based on his experience in teaching and consulting in nonformal education. Competencies are a significant component of this paradigm, and the focus of this article. The paradigm sketched into a diagram in this presentation has potential for guiding competency-based training programs and self-directed professional development for administrators. It can also be used to guide search and screening committees in hiring the best candidates for administrative positions in nonformal education.

The Need to Understand Competencies of Administrators in Nonformal Education

How many of your colleagues have become administrators without really being prepared? They were good teachers or researchers or extension workers; so they found themselves rewarded with an administrative position. Yet, they had only a partial idea of the skills, knowledge, and attitudes that they needed. If they had any time or interest, before the avalanche of administrative problems, they might have picked up a book on management or administration in the private sector.

The literature on administration in business is voluminous. The focus of books and articles ranges from “how to” (Winston, The Organized Executive, 1994; Nelson & Economy, Managing for Dummies, 1996) to theoretical (Senge, The Fifth Discipline, 1990; Gitlow & Gitlow, Total Quality Management in Action, 1994; Hersey & Blanchard, Management of Organizational Behavior, 1977). Literature on leadership, likewise, varies from the highly theoretical (Bass & Avolio, Transformational Leadership, 1993; Yukl, Leadership in Organizations, 1998) to popular treatments (Covey, The Seven Habits of Highly Effective People, 1989; Peters, Thriving on Chaos, 1987; Smith, Taking Charge of Change, 1996). Still, the competencies of administrators in the private sector are often not the same as the competencies needed by administrators in nonformal education. Even the competencies of school administrators differ from those of nonformal educators.

Nonformal education is learner-centered. The organization must adjust to the learners rather than expect learners to adjust (like elementary school students) to the organization. Nonformal education favors a cafeteria curriculum and a lower level of structure than schools. So, administrators must be more flexible. Practical learning and immediate usefulness are two features of nonformal education that mean
administrators must be more responsive to their clients. They cannot hide behind legalistic and bureaucratic walls if they are to be effective. In nonformal education we often depend heavily on volunteer staff who have different requirements than paid staff.

A recent text, Management in Extension (Buford, Bedeian & Lindner, 1995), is more relevant to nonformal education than the sources mentioned above. It presents many issues facing administrators of U.S. Extension programs. It does not, however, provide a framework that defines administration of nonformal education, and the competencies of administrators.

A Paradigm of Nonformal Education Administration

A paradigm of nonformal education administration, including the competencies of administrators has been developed by the author. It was initially conceived in diagram form as part of a course on public administration for international development, taught by Dr. Robert LaPorte at Pennsylvania State University in 1994. The diagram was inspired by R. A. Mackenzie’s article, The Management Process in 3-D, in the Harvard Business Review (November-December, 1969). In 1995 and 1996, the diagram was used in courses and workshops on international nonformal education in the United States and Mexico. In 1997, it was used as the theoretical frame for a course at the University of Nebraska, “Administration of Agricultural Agencies and Organizations.” In each case, the elements of the diagram were tested by students’ and administrators’ experience, and by the literature on management, especially Cooperative Extension programming.

The paradigm is shown in Figure 1. The bottom slice (shaded) is the key for the rest of the diagram. At the center of the diagram are the “assets” of the administrator: people, ideas, and resources (funds, materials, equipment, and time). Assets possessed by administrators enable them to fulfill the “roles” of leader, creative thinker, and manager. Furthermore, “abilities” needed to execute these roles include communication, decision-making, and problem solving.

The numbered “steps” in the next layer are the basic steps of the administrative process: anticipate, plan, organize, staff, facilitate, and evaluate. The bottom layer gives the specific competencies that administrators need in order to be effective.

Although this list of competencies may appear to be generic to any administrative position, it is quite different from Mackenzie’s list of competencies for business. Some of the most striking differences are in steps 2 through 5. An administrator in nonformal education usually is quite concerned about securing external funds and coordinating with other agencies (step 3, organize). Staffing (step 4) includes attention to both paid staff and volunteer staff. The latter are quite different in their supervisory requirements and expectations. Step 5, facilitate, is usually called “direct” in management literature. Directive leadership is appropriate for highly structured organizations seeking profit and employing paid staff. An administrator in nonformal education, however, needs to use democratic and non-directive leadership styles as well as a directive style. This combination of three styles employed depends on the particular situation, and is called “facilitator leadership” by the author. For a more detailed discussion of facilitator leadership, see the article on Leadership for Nonformal Education published in this Journal [Etling, 1994].
Uses of the Paradigm

So, what use is this paradigm of administration in nonformal education? The author would like to suggest three potential applications. Unlike in business, training for administrators in nonformal education is often “on the job.” The diagram could be used as a guide for professional development for new administrators. It could serve as a checklist for administrators to evaluate their own competence and then as a guide to seek inservice training opportunities.

If programs are being developed to train new administrators or to update experienced administrators, the diagram could be a guide for the content of the training. It could be used as a checklist to assess the needs of trainees in order to choose content that is most appropriate to any particular group.

A third application is for recruitment and selection of candidates to fill an administrative position. Too many times administrators are chosen for their “fit” in the organization. “Fit” often means the likelihood that the candidate will follow orders and not make waves. The diagram allows search committees to focus on competencies and ask questions which cause candidates to focus on those competencies.

A Caution

Research is needed for the diagram to realize its full potential. Potential areas of research include (a) verifying and validating the competencies in actual nonformal education settings, (b) differentiating between competencies needed by administrators in the private sector and in nonformal education, and (c) correlating competencies with administrative effectiveness. Based on results obtained, the paradigm could
be refined and evolve into a model which would have reliability and utility.

References


EXTENSION AGENTS – A “TOOL” FOR BECOMING INTERNATIONALLY ENGAGED?

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“One must care about a world one will not see.”
Bertrand Russell

Acker and Scanes writing in the Spring 1998 Journal of International Agricultural and Extension Education provided a commentary on the rationale for globalizing programs in U.S. colleges of agriculture. Their commentary supported the agenda for action developed by the Globalizing Agricultural Science and Education Programs for America (GASEPA) Task Force which emphasized: “We urgently need to find ways to increase the level of engagement of our resident teaching faculty, research scientists and extension agents in addressing global dimensions ...” (GASEPA, 1998, p.1).

One of the agenda items outlined by GASEPA is the development of mutually beneficial collaborative global partnerships. Partnerships between colleges and universities to increase global competency, identify and address issues of mutual concern, and conduct related research are encouraged. Likewise, linking farmers and agribusinesses to international trade providers and establishing mutually beneficial partnerships not only in the private sector, but among those interested in creating greater awareness and understanding of global environmental concerns is encouraged as part of the agenda.

Partnerships between institutions are the result of relationship building between individuals. Yet, one wonders how many international scholars and graduate students visit U.S. campuses to continue their education yet never have a planned and purposeful experience which allows them to travel within the state, meet and interact with community leaders, local educators, and business persons. There is also a great deal Americans can learn from international visitors just as many within the U.S. have benefited from experiencing a foreign environment. Could extension professionals become the “tool” linking international scholars at the land grant university with the people of the state?

Our world in general and the educational world in particular are in a period of change. With the emerging global economy and growing interdependence among nations, land grant universities as a part of their mission have a responsibility to local constituents to educate within the framework of the realities of economic, social, environmental, and political interdependence. Extension, as a major part of a university’s outreach component, needs to examine its response to this challenge. How can extension educators facilitate constituents developing a fundamental understanding of global interdependence? Particularly when one of the barriers to this is often the Extension professional’s lack of knowledge and experience.

Why not create an organizational system to facilitate the hosting of international graduate students and scholars by county extension professionals? Why not as a part of these planned experiences incorporate dialogue with local advisory committees, community leaders and educators about issues and concerns of mutual interest? Why not pre-plan a visit to a
farming operation to be more than a “show and tell” experience? It would seem that an opportunity to increase the level of engagement between international visitors, local Extension agents and constituents lies before us and needs only a small amount of structure and organization to begin the exchange of ideas and search for shared interests and concerns. From these exchanges, the chances of collaborative partnerships and relationships across the globe increase.

For extension professionals, the opportunity to meet and host international experts provides added impetus to participate in workshops and other staff development opportunities which develop cross-cultural competency or increase expertise in global economics and decision making. Extension has typically tried to be responsive to local needs, but at times local constituents need leadership from extension professionals who can see a need that may be invisible to the general population. Extension may have a unique role to play in helping traditional rural and agricultural county clientele to recognize the need for education on international issues. International visitors and the questions they often ask have a wonderful way of stimulating us to look at what we take for granted in new and different ways. Incorporating visits by international guests into the daily activities of extension professionals and allowing these guests to participate in extension activities will greatly enhance for them what is learned in the classroom about extension and educational philosophy.

In Ohio, while an organizational system for hosting international students and visitors has not been institutionalized, members of the Extension International Committee from across the state on occasion host and coordinate tours for visiting scholars. A committee to guide the internationalization effort, working closely with the person designated to provide international leadership within the college can be effective in defining and developing professional growth opportunities for extension personnel.

Related to the hosting of international experts, a tool that has been developed by the author and was utilized in Ohio prior to a visit by 4-H professionals from Taiwan was an “International Visitors Background Guide”. It is a brief questionnaire that gathers background information about each guest, their experiences and interests. Special travel or dietary needs and a checklist of possible extension and community experiences is included. Once completed by the international guest, the Guide provides both the sponsoring campus faculty member and extension hosts important information to plan experiences that enable mutual learning to take place. The Background Guide could easily be adapted by others to use in hosting or to provide information about U.S. study tour participants who may be participating in a study tour or study abroad program. The Guide is reproduced for reader use.
[CONTACT EDITOR FOR GRAPHIC]
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We live in a world characterized by rapid change. One way of managing this rapid change is through sharing information and collaborating. A collaborative arrangement with the European Journal of Agricultural Education and Extension (EJAEE), renamed The Journal of Agricultural Education and Extension, enables us to publish abstracts of their articles. They can do likewise. Both journals benefit as a result.

The Journal of Agricultural Education and Extension is published quarterly from Wageningen Agricultural University, The Netherlands. The main focus of the journal used to be on developments in European extension and education. The change in name and focus reflects the growing number of contributions and readers from outside Europe.

In this article, we bring you modified abstracts of six articles selected from the last five issues of the journal. Articles we considered thought-provoking were selected.

Agricultural Education for Sustainable Rural Development: Challenges for Developing Countries in the 21st Century
L. van Crowder, W. I. Lindley, T. H. Bruening and N. Doron

The authors posit “A critical issue in the 21st century will be the changes and adaptations required in agricultural education … for it to more effectively contribute to improved food security, sustainable agricultural production, and rural development.” Based on a review of the results of eight roundtable conferences and consultations organized by the Food and Agriculture Organization on issues and opportunities for agricultural education and training for developing countries in the 1990s and beyond, the authors conclude (a) that while agriculture will be a major contributor to the economies of most developing countries, shifts in employment opportunities for agricultural graduates from production to related sectors will require curriculum revisions that should reflect the labor needs of a market-oriented private sector, social and environmental issues, process skills, and learning psychology processes, (b) that agricultural colleges and universities will need to communicate better their value to society, and inculcate a problem-solving, holistic approach, and (c) that inter-university alliances, regional collaborations, and a technology-based communication infrastructure will need to be emphasized and operationalized. To accomplish these goals, agricultural education institutions, in the authors’ view, will need to abandon long-established traditions of academic isolation and become active contributors to sustainable agricultural rural development through innovative teaching, research, and extension. (J Agr Educ Ext 1998, 5, 2, pp 71-84)

Promoting Pluralism
W. Zijp

Willem Zijp, Agricultural Extension Specialist in the World Bank, Washington, D.C., presents his view of the future direction and focus of agricultural extension. To meet farmers’ needs in an increasingly complex, technology-based, changing environment, Zijp proposes some
important changes which will lead to more pluralism in the services offered, and the organizations providing these services, from a “one size only” to a “tailor made fitting.” A major theme that runs through the article is the critical role of knowledge and technology in extension. The author recommends a practical agenda for action, featuring five ways to improve support to extension: help farmers to mobilize themselves and get organized; help governments to shrink to their core function and decentralize services; increase the financial sustainability of public extension through creative and alternative funding mechanisms; reach underserved farmers and other rural people by better use of local media and information systems; and support extension practitioners by establishing and developing a public-private partnered extension clearing house for information and responsive systems. (J Agr Educ Ext 1998, 5, 1, pp 1-12)

Interactive Regional Policy Development: Cooperation in Northern Cameroon
J. H. A. M. Brouwers, M. Ali, and J. V. Ferrari

Solutions for today’s problems in an increasingly complex world require increased collaboration between different organizations. This is especially the case in regional planning at the supra-project level, involving different partners like government and non-government organizations, researchers, and training and funding agencies. The article provides an overview of an experience in regional planning in Northern Cameroon, focused on the methodology of regional participative analysis and policy assessment. The methodology enabled structural interaction among representative organizations to generate new information and general concerns. In the regional analysis, opinions and options were assessed which led to the identification of key issues and setting of goals for regional policy. Regular workshops and feedback meetings facilitated a regional dialogue on development issues. This resulted in complementary efforts whereby larger, centrally-planned projects and local self-development activities conformed to a regional strategy and were mutually supportive. The regional position was compared to the international position in policy assessment which gave an impetus for regional-level factors to be considered. The methodology resulted in the creation of an effective regional network in Northern Cameroon. The process was strengthened by the present regionalization policy of the Cameroon government as well as the urgency felt at regional level to establish more effective collaboration. Environmental problems, the most important issue for this region, were elaborated upon by the network, resulting in harmonization of intervention methods, clearer linkage mechanisms among funding, research, and development agencies, identification of legislative support for sustainable development, and the assessment of more effective participation. However, it is still to be seen if the new network structures can be maintained in the present political scene of Cameroon. (J Agr Educ Ext 1998, 4, 4, pp 225-230)

Beyond Technology Transfer
P. G. H. van Beek

The author takes issue with the position of a 1996 conference that extension personnel have moved beyond technology transfer. He argues that this is not the case. This becomes clear when looking at what people do (theories in use), rather than what they say they do (theories espoused), and when the innovations they are promoting have low adoption rates. He suggests a more appropriate descriptor is “Expanding from Technology Transfer”. A broader view of extension is then presented, followed by reasons why individuals in key organizations are not likely to change their thinking or to voluntarily expand from technology transfer in the future. These arguments are supported by data from 200 indepth interviews using a set of assumptions about agricultural knowledge systems. The author concludes that an expansion from technology transfer will benefit farmers and other end users but will require a concerted effort by the main beneficiaries to overcome subtle but strong resistance. Extension personnel can and should play a significant part
Towards a Participatory and Demand-driven Training and Visit (T&V) Agricultural Extension System: A Case of Tanzania
A. W. van den Ban and D. S. Mkwawa

The Training and Visit System of agricultural extension (T&V) in Tanzania is currently a top-down technology transfer system. The Ministry of Agriculture is convinced that the extension system would be more effective if it were more participatory and demand-driven. Village Extension Officers (VEO) learn important points, which are passed on to farmers. However, most farmers do not follow VEO recommendations because the recommendations do not give enough attention to the limited investment possibilities of farmers. Considering the large diversity among farmers in income, access to markets, and agro-ecological situations blanket recommendations cannot work. Farmers need information that helps them to make better decisions by themselves adapted to their goals and their situations. This can only be realized with a decentralized system of decision making in the extension service, and a participatory system of supervision and inservice training. Discussed in the paper are difficulties involved in realizing such a major change. Time, training, and a systematic strategy of organizational change are needed to overcome these difficulties.

Planning Agricultural Education in India
D. Rama Rao, U. Muralidhar and Jagdeesh C. Kalla

The study reports the growth and status of agricultural education in India and projects a future scenario. The forecast of trained agricultural manpower is based on socioeconomic considerations. An education plan is suggested. Issues relating to educational policy to achieve supply-demand adjustments are discussed. Three main recommendations emerged from the study. First, the number of diploma holders at the lower end of the professional ladder needs to be increased to meet the demand for more trained and readily available manpower to help farmers become aware of technological developments in agriculture. Second, the number of specializations at postgraduate level needs to be decreased, and agricultural education needs to be more broad-based to meet occupational demands. Third, the participation of the private sector in the institutionalization of agricultural education may offer healthy competition to state-supported agricultural universities and motivate entrepreneurship.
(J Agr Educ Ext 1997, 4, 1, pp 67-80)
Daniel Selener’s 358-page book distills his careful review and analysis of the literature about participatory action research and portrays his own evolving thought. When preparing to teach “Participatory Research and Development” at Cornell University in the 1980s, Selener noted that the literature introduced many parallel terms – action research, participatory inquiry, collaborative inquiry, action inquiry, cooperative inquiry.

To guide his analysis of over 1,000 references, he developed his own definition – research and evaluation methodologies that empower people and contribute to a more just society. He clarified his purpose – to help researchers, educators, practitioners, and citizen groups engage others in thinking about social and political transformation.

His analysis revealed that participatory action research (PAR) has been applied in four broad settings: community development, organizational development, schooling, and sustainable agriculture.

To assess PAR as used in each of these four settings, Selener developed focus questions:

1. What are the origins of participatory research? He emphasized the historical, philosophical, professional, and organizational roots. For instance, in his chapter on Farmer Participatory Research, the author traces the evolution of extension from the transfer-of-technology model, to Training and Visit, Farming Systems Research/Education and to the participation of small holder farmers in creating appropriate technologies.

2. What is the definition and main focus of PAR? (See, for example, Selener’s definition, above.)

3. What are its principal components and characteristics? For example, he searched for clues about: What is the origin of the problem that prompted the research? Where does the research take place? Who is involved and, more specifically, are the oppressed engaged? What roles do they play in the research process – defining the problem, choosing research methods, gathering data, analyzing findings, using conclusions? What is the role of the researcher? What are the ultimate goals of the research? What are the outcomes in terms of the participants?

4. What are underlying assumptions? What are assumptions, for instance, about the credibility of “indigenous knowledge” among smallholder farmers?

5. What are the types of research? In the agricultural setting, for example, Selener noted a continuum of on-farm trials: researcher managed-consultative-collaborative-farmer managed.

6. What are key issues in each setting?

7. What methodological guidelines are suggested through each evolutionary phase of research?

8. What are the intended final and process outcomes? What are actual outcomes?

Selener offers a crisp case study to illustrate the application of his analysis of PAR in each of the four settings. He draws case experiences from around the world.

I believe that Part I could be summarized in a useful matrix: one axis representing the four settings – communities, organizations, schools...
and farms – and the other axis featuring the focus questions. Each cell could summarize Selener’s findings. But more than that, the matrix could guide our thinking as we plan to use PAR in any given setting, as we consider crucial questions appropriate to our setting and purposes.

In Part II, Selener reflects about his observations, relative to his initial focus and subsequent thinking. He asserts, for example, that participation does not necessarily increase power for oppressed communities, nor lead to more democratic, more holistic decision making. It depends, he says, on choices relative to the focus questions articulated early in the inquiry and the context in which the research is conducted. He concluded that some kinds and levels of involvement illustrate pseudo-participation; others feature genuine participation.

He then places PAR within a spectrum of western theories of social change, whether, for instance, they illustrate the equilibrium paradigm or the conflict paradigm.

Finally, Selener draws out implications for practicing Participatory Action Research. Here, he offers an insightful adaptation of the well-conceived focus questions that guided his assessment.


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Within the bibliography, I did not find references to literature that I expected to see, for example, the research in Africa by Niels Röling and his colleagues at Wageningen Agricultural University, The Netherlands; and Claude Bennett’s thoughtful framework published in 1992 by the U. S. Dept. of Agriculture entitled “Cooperative Extension Roles and Relationships for a New Era, Meeting Public and User Needs Through the Generation and Adoption of Practices and Technologies – An Interdependence Model and Implications.”

But these omissions don’t detract from the power of Daniel Selener’s deep beliefs, his comprehensive literature review and analysis, and the care with which he introduces key questions for our considering participatory action research as an instrument to build a better world – from the inside out.

This paperback book (ISBN 9978-95-130-X) is available for the equivalent of $30 US issued by a bank in the U. S. A. or in Europe from: Global Action Publications, Apartado Postal 17-08-8494; Quito, ECUADOR, SA. For more information: fax (593-2) 443-763; <daniel@iirr.ecuanex.net.ec>

Daniel Selener is Latin America director of IIRR – International Institute of Rural Reconstruction. IIRR is a nonprofit NGO devoted to improving the quality of life of the rural poor in developing nations of Africa, Asia and Latin America. IIRR grew out of the revolutionary grassroots development movement in the 1920s founded by Dr. Y.C. James Yen in China.
Nonformal educational models around the world have successfully used educators who do not have formal teacher preparation or certification. Many times these educators are volunteers. In the 4-H program, parents are encouraged to volunteer to teach specific subject matter to the youth of their community. Paraprofessionals are sometimes hired, based on their expertise, to teach their specialty part time. Cooperative Extension uses a variety of paraprofessionals. Other programs have identified outstanding farmers who are paid full time to teach agricultural techniques in their local districts.

Selener and associates have published a book which describes and analyzes the experiences of “farmer promoters” who fit all three of these categories. The farmer promoters all worked for the International Institute for Rural Reconstruction (IIRR), a non-governmental organization with a long record of community development emphasizing agriculture, leadership, and improving the quality of life of the rural poor in Africa, Asia, and Latin America. As a result of two workshops, one in Ecuador and the other in Honduras, the authors wanted to systematize and analyze the experiences of forty-six farmer promoters who came from IIRR’s farmer-to-farmer extension programs.

The resulting book is a relatively short (140 pages), concise, no-nonsense look at the advantages and disadvantages of different hiring patterns (selection characteristics and procedures, work expectations), different levels of employment (volunteer, part-time, full-time), different support systems (incentives, training, technical assistance), different work locations (in their community or in other communities), and different assignments (generalist or specialist). One chapter is devoted to the special concerns of farmer promoters who are women. Each chapter presents a brief discussion of the relevant issues and alternatives, followed by a tabular analysis of the strengths and weaknesses of each alternative. The chapter closes with recommendations based on the analysis.

Introductory chapters describe how IIRR got involved in farmer-to-farmer extension and the nature of the work of IIRR’s farmer promoters. Subsequent chapters take up the discussion, analysis, and recommendations related to the issues mentioned above. Four case studies then describe how farmer promoters have worked in Mexico, Nicaragua, and Ecuador (two case studies).

The book is full of concrete suggestions and cautions that come from IIRR’s experience. It would be useful to development organizations who wish to plan or evaluate the use of community-based educators similar to IIRR’s farmer promoters. It would be useful to trainers and support staff who want to increase the effectiveness of community-based educators. By studying this book, students of international development would gain greater insight into roles and issues related to local educational projects.

The in-depth analysis of experiences with four related case studies is the strength of this book. Much information is packed into relatively few pages. The information is well organized and easily accessed. Limiting the focus, however, also limits the scope of the book. Forty-six participants in two workshops does not yield a very large sample.

Geographically the experience is confined to four Latin American countries. No attempt is made to compare IIRR’s experience with similar
programs using community-based educators. The authors, however, are careful not to generalize their experience to settings beyond the ones reported in the book.

An “outside” point of view would also be helpful to balance the perspective of the book. The information sources and analysis all come from within IIRR. The recommendations would be strengthened considerably by including the perspectives of individuals from other organizations.

Reading this book one might ask certain questions about community-based education. What importance does culture have in organizing and supporting farmer promoters? How do farmer promoters relate to formal educators and other development groups in their communities? Has IIRR tried the farmer promoter model in Asia or Africa? If so, what are the commonalities and differences among farmer promoters. If not, why not? How important to the success of the farmer promoters was IIRR’s institutional framework and agreements with host country governments? What was USAID’s role in farmer-to-farmer extension (this agency’s logo appears on the book cover)? Can anyone compare the farmer promoters with the University of Massachusetts’ educational “facilitator” project funded by USAID in Ecuador in the 1970s?

Despite these limitations, the book is recommended to those interested in nonformal education, health, agricultural development, and community development. They can draw their own conclusions and make their own applications. They will certainly find insights to consider in community-based educators whatever the setting.

[Editor’s note: “Participatory Action Research and Social Change” by Daniel Selener, also reviewed in this issue, is more comprehensive than this book and includes a discussion of the relationship of farmer promoters with others in their communities as well as examples of participatory action research from throughout the world.]

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Improving agricultural extension through a systems approach: Lessons from the Caribbean agricultural extension project (CAEP). Joseph Seepersad. (1/2: 22-27)

Incorporating indigenous knowledge systems into agricultural and extension education programs: A study of the perceptions of extension professionals in India. Robert A. Martin & B. Rajasekaran. (1/2: 13-21)

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The association comes of age. Jack Elliot. (2/2: 2)

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Announcements

National Extension Conference in India

“Extension Education for Sustainable Development” is the theme of a national extension conference to be held in Mumbai (erstwhile Bombay), India, from December 29-31, 1998. The Indian Society of Extension Education which was formed about 40 years ago is organizing the conference in collaboration with the Department of Agriculture, Government of Maharashtra, Rashtriya Chemicals and Fertilizers, and the Family Welfare and Research Centre.

The conference is focused on five dimensions relevant to education and sustainability, namely extension approaches; training and human resource development; production input technologies; gender issues; and management and communication. Topics have been identified in each dimension and announced to scientists and practitioners who will present papers and engage in discussion.

Awards instituted by the Society for research, teaching, and communication will be given to scientists, practitioners, and students who have made contributions to the field.

Inquiries regarding the conference, papers, and proceedings, as well as the Society may be addressed to Dr. O.S.Verma, President, Indian Society of Extension Education, Division of Extension and Training, Indian Institute of Sugarcane Research, Rae Bareli Road, Lucknow, 226 022, India (fax: 91-522-480739).

Journal of Extension Systems on Web

Journal readers may be interested to know that abstracts of published articles in the Journal of Extension Systems (JES), a bi-annual international journal, are now online at the JES’s new website (http://www.caf.wvu.edu/jes/index.htm).

JES, published since 1985, is dedicated to advancing understanding of extension systems through empirical investigations, theoretical analyses, and practical experiences. It is published in India under the direction of the chief editor, Dr. O.S.Verma, Division of Extension and Training, Indian Institute of Sugarcane Research, Rae Bareli Road, Lucknow, 226 022, India.

Manuscripts for publication should be sent to the editor, Dr. Layle Lawrence, 2056 Agricultural Sciences Building, West Virginia University, Morgantown, WV 26506-6108, USA.

Manuscript guidelines and subscription information may be viewed on the Journal’s web address.
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