Background: The Problem-Solving Extension Function

Agricultural extension educational programs around the world have developmental roots, utilizing applied research knowledge to help farmers deal with identified problems focusing primarily on production practices (Harris, et al., 1992). The approach is on problem solving in response to a learner-defined obstacle (pests, disease, low yields) with the intent of improving learners' welfare (increased yields, higher net returns). The initial focus of extension work is on the adoption of fixed, generalizable research-based practices and decisions such as technology adoption and adjustments to deal with common farming problems.

However, over time the extension education focus becomes more informational and ultimately more institutional (Table 1) as the research and knowledge base grows, and as the needs of farmers become more complex in more integrated economies. For example, responses to pest and yield problems may evolve into more systems-based integrated pest management and nutrient management strategies, applying knowledge to the specific needs of the individual farmer and to the microenvironment through the adoption of technology and the use of information. The tasks of the farmer become oriented toward more comprehensive decision making rather than problem solving.

Table 1. Educational Program Typology, Selected Program Factors

<table>
<thead>
<tr>
<th>Education Factor</th>
<th>Developmental Type</th>
<th>Informational Type</th>
<th>Institutional Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goals</td>
<td>Problem Solving</td>
<td>Information Transfer</td>
<td>Knowledge, Competence</td>
</tr>
<tr>
<td>Objectives</td>
<td>Resolution</td>
<td>Timely, Critical Knowledge</td>
<td>Cognitive Skill</td>
</tr>
<tr>
<td>Role of Knowledge</td>
<td>Problem Solving</td>
<td>Selecting from Alternatives</td>
<td>Decision Making</td>
</tr>
<tr>
<td>Standard of Effectiveness</td>
<td>Termination of Problem</td>
<td>Outcomes of Selection</td>
<td>Mastery of Content, Decision Outcomes</td>
</tr>
<tr>
<td>Examples of Use</td>
<td>Insect or Disease Control</td>
<td>Response to Market Prices or Government Regulations</td>
<td>Negotiation, Management</td>
</tr>
</tbody>
</table>

Source: Adapted from Boyle, 1981, p. 7.

2. Henry M. Bahn is the National Program Leader and Patricia McAleer is a Program Specialist, Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture.
The agricultural extension model in its various forms has historically held grassroots appeal and high farmer acceptability due to its focus on problem solving and the practical application of knowledge. It placed relatively low demands on farmers: recognize problems (e.g., reduced yields due to insects, disease or the need for irrigation), recall the available body of valid interventions (e.g., pesticides, fertilizers, management methods), and apply the most appropriate recommendation. The itinerant extension educator who was armed with demonstration plots, research results, and decision rules was well suited to apply this model to service the educational needs of local farmers.

As more complex marketing, pricing, and regulatory issues become prevalent in the agricultural sector, informational education become more important as timely and accurate data must be provided to farmers to support their decision making. When dealing with more centralized marketing systems, for example, the farmers must localize prices \(^3\) by adjusting distant market prices for transportation, handling and other marketing costs, then compare the existing market or pricing opportunities, and then select the best market alternatives based on criteria of profitability, cash flow, or other considerations important to the farmer. Extension is a critical link between farmers and more complex and more highly regulated markets as value added and entrepreneurial opportunities emerge.

**Contemporary Issues Complicate the Modern Extension Function**

Historically, farmers have been self reliant and take pride in their independence, but in the modern marketplace they are no longer as independent. Economic, social, and legal changes broaden the farmer’s tasks to include management decisions on what (and perhaps how) to produce, and when and where to sell, based on market opportunities rather than their personal needs. Price incentives (meeting government grades and standards, adhering to contract specifications and delivery schedules), and performance penalties (like discounts for off-quality products) take on special importance in a more regulated and market-oriented agriculture. As markets change, the rules, incentives and decision criteria appropriate in the past (e.g., producing for personal needs and locally selling the surplus) are no longer sufficient to effectively guide the farmer’s production and marketing decisions.

Indian agriculture is rapidly diversifying toward high-value foods like fruits, vegetables, milk, meat, poultry, and fish. This is accompanied by various market structural adjustments to accommodate assembly, packaging, processing, transporting, warehousing, and retailing of food products, often in distant locations. The market transformation presents opportunities as well as challenges to farmers and to the extension and outreach agencies that serve them.

The shift toward high-value agricultural commodities to be primarily motivated by changes in food consumption patterns (Gulati, et.al. 2005). Four key factors contribute to this change: 1) rapid economic growth allows consumers to shift from grains and starchy staples to higher-value foods; 2) urbanization accentuates the shift by changing lifestyles, increasing exposure to media, and availability of high-value foods; 3) more liberal trade policies create

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\(^3\) More of what consumers spend for their groceries is going to firms that process, package, transport, and distribute agricultural products for distant urban markets. The farm share of retail food prices has been shrinking. U.S. farmers earned 33 percent of what consumers spent for fresh fruit at U.S. retail food stores in 1982, but just 20 percent in 2004. The share for fresh vegetables shrunk from 34 percent to 19 percent (Hayden 2006).
new export and import opportunities; and 4) less restrictions on foreign direct investment change food marketing channels, particularly food processing and retail distribution.

Extension education to enable farmers to analyze modern problems in a more global context, and to evaluate the consequences before making decisions is difficult if those problems are perceived as externally imposed by the market or government, or perceived to be detrimental to the farmer’s independence or personal welfare. In particular, market prices and government regulations are beyond the direct control of the farmer (imposed by external forces), and they require the farmer to respond to them. Commercial market chains are highly dependent on grades and food safety standards, volume and timing commitments, and pricing arrangements. These requirements are external in nature (Cronkleton 1991) and they require farmers to make decisions that are compatible with the broader interests of others in the marketplace. Negotiated contract farming may dictate not only what the farmer produces, but also the specific farming methods and what chemicals or fertilizers must be used. These contracted arrangements add value – and cost – to the production and marketing process, but failure to perform them in a satisfactory manner can result in price discounts, legal and financial penalties.

**Extension Education Responses in the U.S.**

Over the past several decades, U.S. agricultural policy has moved toward more “market oriented” programs in an attempt to isolate the effects of subsidies or government transfer payments from production and marketing decisions. To the extent that market prices became more relevant to gross farm income, this required a modified approach to farmer education using a more institutional focus to serve contemporary farmers. Rather than seeking information solely to improve their welfare, farmers now need information to avoid penalties for not meeting quality specifications, or for failing to follow regulations. The developmental and informational paradigms of pervious extension education programs are no longer sufficient to serve farmers facing changes that lie beyond their individual control. This has led to a more institutional education model, designed to help the farmer develop the analytic and decision making skills to actively manage his or her farm, rather than just respond to the recommendations and counsel of extension providers in response to general problems.

In the U.S, nearly 550 university affiliated economists currently support the mission of the Cooperative Extension Service; 21 per cent are marketing economists and 9 per cent hold agribusiness appointments. Extension economics work focuses on integrating knowledge generation, information dispersion, and choices for farming and agricultural business decision making. Programs may be targeted to specific audiences, for example small or limited resource farmers, women and minority producers, or specific commodities and markets such as livestock, feed grains, etc. Extension economics work typically has equal emphasis on helping farmers avoid poor decisions and errors and assisting them in making sound and economically justified production and marketing that benefit individual farmers and the broader agricultural economy (Table 2). This work integrated contemporary issues including market structural change and public policy influences and impacts on the farmer’s management decisions.
Several particularly effective extension education models have evolved to deal with the changing marketing needs of farmers in the United States, and are available through the World Wide Web ([http://www.csrees.usda.gov/ProgViewRelated.cfm?prnum=8967&lkid=5](http://www.csrees.usda.gov/ProgViewRelated.cfm?prnum=8967&lkid=5)). Often these programs are developed and offered in collaboration with the private sector – NGOs, buyers, processors, lenders, contractors and others who can add a “real world” element to training and education programs.

Several dynamic U.S. agricultural marketing management extension models are summarized below.

**Marketing Clubs**

Fashioned after investment clubs where investors band together to pool their money and buy stocks and bonds, agricultural marketing clubs provide an opportunity for small groups of farmers to meet on a regular basis to improve their knowledge of the marketing system. These clubs are educational in nature and farmers sell independently and individually. On rare occasions producers may pool their product to sell in larger quantities or others may form marketing cooperatives. The educational model uses self study, group study, and hands-on application. Clubs are usually organized and sponsored by a local extension official, and may include a buyer, processor or merchant and a lender to provide technical education.

Marketing club agendas are set by the members, and members participate as both learners and teachers. They may choose such activities as evaluating marketing alternatives, determining what pricing opportunities exist, computing cost of production and acceptable profit goals, and preparing cash flow projections (Cooperative Extension Service, undated). Some marketing clubs are established collaboratively with farm organizations, and in some cases, the extension function is eventually transferred to a farm organization (Montana Market Master, undated).

Farmers report financial benefit from participating in marketing clubs. In Minnesota (Minnesota Extension Service 2007) 62 marketing clubs were surveyed, and 173 farmer responses were returned. Most farmers (155) reported positive financial impacts due to attending marketing group sessions. They reported a 163 percent improvement in the use of

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4. In India, Saravanan and Veerabhadaiah found that NGO and agricultural consultancies extension service programs have better organizational performance and higher clientele satisfaction.
5. One farmer stated, “I started out farming like (my father), just using the cash markets and taking what I could get at harvest time. But over the years, I learned and practiced the marketing tools that are available and incorporated using the markets into the everyday way I do business.”
marketing plans with an average increase of income per farm of $20,401. Club participants in Texas (Texas Agricultural Extension Service 2007) reported increased confidence in dealing with their marketing activities, as well as increased use of marketing plans, determining cost of production, and price analysis. Texas producers reported an average increase of 2.95 percent in cash receipts, or $12,263 per farm.

Marketing clubs were used extensively throughout the USA during the 1980’s and 1990’s. They have been beneficial in helping farmers develop and execute their own marketing plans and strategies, and also they learn new skills like hedging, contracting, developing new market opportunities, and learning about new risk management tools such as crop insurance.

**Master Marketer Training**

Taking the concept of the marketing club to a more rigorous level, Texas A&M University Extension Service developed a program called the Master Marketer Educational System. It includes a 65-hour intensive marketing education course during which farmers, lenders, and others are trained in marketing techniques, marketing plans, technical analysis, futures and options contracts, and many other marketing related topics. The curriculum-based program is taught by both university faculty and industry experts. The set of skills that the farmers develop becomes their marketing "toolkit" which equips them to apply their knowledge directly to any situations that arise when conducting agricultural business, making them less dependent of the knowledge of others.

Starting and maintaining marketing clubs has been a crucial part of the Master Marketer Educational System. Master Marketer serves as a training program for marketing club participants and leaders, giving them the marketing tools and reference materials to share the education with other producers.

The Texas Master Marketer program has received several regional and national extension awards in the U.S., and it has been replicated in other states. In a survey of over 750 participants during the 1996 – 2004 period, a weighted average increase of 4.5 percent in gross farm income was documented. Texas economists report large cumulative impacts from this program:

Texas Master Marketer graduates have collectively received cumulative impacts exceeding 100 million dollars since the project began in 1996. Conservatively assuming a 10-year useful life of the marketing information conveyed in the program, and assuming 75 percent of producers remain in business over this ten-year period, the projected economic impact of Master Marketer training exceeds $190 million in impacts, below, for graduates for the project time frame of 1996 – 2016. This is an average increase over all participants whether they did or did not implement what they were taught.

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6 The Master Marketer program follows the very successful format of the Master Gardiner program, which for over 30 years has identified, trained and supported local experts to support extension efforts by serving as mentors, experts and counselors to other gardeners in their communities.
Risk Management Oriented Training

Over the past decade, a large part of U.S. agricultural extension programming has focused on risk management. This includes mitigating historical production risks (disease, drought, etc.), market and price risk, and external risks including food safety, financial, technology, legal, and other risks to farmers.

The National Ag Risk Education Library (http://www.agrisk.umn.edu/) is a major component of USDA's Risk Management Education program. The library organizes thousands of scientifically valid peer or merit reviewed management materials that help producers and agricultural professionals quickly locate information, tools, and assistance on specific risk management topics. It includes several major components:

Main Library contains over 2,000 documents organized by production, marketing, financial, legal, and human risk topics; Specialty Crop Library contains documents specifically related to specialty crops; Budget Library contains more than 2,750 crop budgets representing over 280 crops and more than 425 livestock budgets to help producers evaluate alternative enterprises; FINBIN Financial Database contains actual cost of production data from 3,500 farms representing more than 3.2 million acres of cropland, over 65,000 dairy cows, and more than 900,000 pigs.

In addition to the digital National Ag Risk Education Library, four regional Risk Management Education Centers (http://www.agrisk.umn.edu/RME/) tailor extension programs to farmers throughout the country. They fund programs specific to regional needs. Each has an advisory council to help set goals and priorities, and relies on farmer input to identify programs that deliver programs based on expected outcomes (Guftason 2006).

Value-Added Agriculture

Interest in value-added agriculture largely arises from the fact that the value added on the farm for each consumer dollar spent on food continues to decline. The Western Extension Marketing Committee8 developed a web site focused on helping farmers who are looking for ways to differentiate their products so that they can receive higher prices, obtain better market access, and experience less volatile price swings. The curricula and resources on this site are designed to assist farmers in identifying, selecting, managing, monitoring, and growing agricultural enterprises that increase value-added marketing on farms and ranches.

The Diversified Agriculture Toolbox (2008) is designed to provide farmers with the tools to help them learn how to analyze, consider costs and potential benefits, and make management decisions.

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7. The National Agricultural Law Center has an extensive inventory of legal education materials, including materials on contract farming (see http://www.nationalaglawcenter.org/readingrooms/productioncontracts/).
8. The Western Extension Marketing Committee mission is to improve the quality of marketing education programs throughout the Western region. Expertise and resources are pooled together by committee members to address common agricultural marketing issues. The committee consists of extension economists from the 13 Western U.S. states, including Alaska and Hawaii. http://ag.arizona.edu/AREC/wemc/
decisions, rather than depend on the expertise of the extension officer, market consultant, or contract buyer. Subjects include Competitive Analysis; Market Structure and Market Strategies; Market Potential; Importance of Product Packaging; Pricing; Importance of Product Differentiation; Promoting and Advertising; Value-Market & Price Risk Reduction; and Supply Chain Management.

**Niche Marketing Training**

Following the same education model as for value added agriculture, a current Western Extension Marketing Committee project on niche marketing will soon provide farmers with information to analyze, consider alternatives, and make decisions regarding:

- Evaluating market size;
- Screening new enterprises;
- Using demand & supply elasticities;
- Evaluating price sensitivity;
- Strategies for a competitive advantage;
- Promotional resources;
- Using primary data; and
- Using secondary data.

The niche marketing education materials will also include detailed case studies on organic horticulture (melons), organic and natural beef, and organic dairy production and marketing.

**Summary**

Changing conditions place new demands on farmers interested in actively participating in national and global markets. Contemporary extension services face an educational challenge to provide the necessary training to prepare farmers to successfully compete in complex, consumer oriented markets. In exchange for the financial benefits of reaching broader markets farmers must give up some independence and must learn new management skills, including negotiating and managing contracts for crop production and marketing.

This paper reviewed the need for extension education program adjustments, and provided several examples of more comprehensive institutional programming that is designed to improve farmer marketing knowledge, decision making capability, and skill. The benefit of this more institutionalized education approach is less farmer reliance on the recommendations and counsel of others, and more on their own abilities and skill to seek and analyze information, compare alternatives, and make their own business decisions. The independence that farmers give up as subsistence producers for local markets is offset by the capacity they gain to effectively participate in regional, national, and perhaps global markets.
References


http://www.diverseag.org/htm/toolbox/marketing