

## **An Approach to Addressing the Economic Accountability Challenge**

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### **Abstract**

Increasing demands on state and federal governments in allocating scarce public funds have led to an increasing need for cooperative extension to demonstrate the economic benefits and impacts of extension programs in order to justify its funding. Economic impact studies of extension programs in Texas serve as the primary vehicle used to demonstrate economic accountability to these key funding sources, and represent an increasingly important component of extension accountability. The implication of this applied research lies not only in the economic benefits of the selected examples presented here, but also in the development of a methodology and application to other states.

### **Introduction**

Cooperative extension (extension) has a long history of delivering relevant educational programs and applied research through a cooperative arrangement with federal, state, and local governments. While the legislation that created extension dates to the Smith-Lever Act in 1914, there have been significant shifts over the years in funding, programmatic areas, resource allocation, and accountability requirements. There has also been a significant shift in the distribution of funding. In 1977, federal funding for extension represented 42 percent of all funds. Funding from the states and local government represented 38 percent and 20 percent, respectively (*Ahearn, Yee, and Bottum 2003*). By 2000, the distribution of funding had shifted significantly, with federal, state, and local representing 24, 49, and 27 percent respectively. With the shift in funding has come more interest in accountability information from the state legislatures.

The term “accountability” can mean different things to different people. For extension, accountability can be defined as the principle that individuals and organizations are responsible for their actions and can be required to explain them to others (USDA-CSREES). A growing area within the accountability setting is economic accountability, which can be defined as the return on the investment made by the government. This article addresses Texas Cooperative Extension’s (TCE) method of addressing the economic accountability challenge by presenting the following methods and

concepts: describing an approach to estimating economic benefits, defining key economic concepts, presenting an overview of two economic benefit studies, and offering a summary.

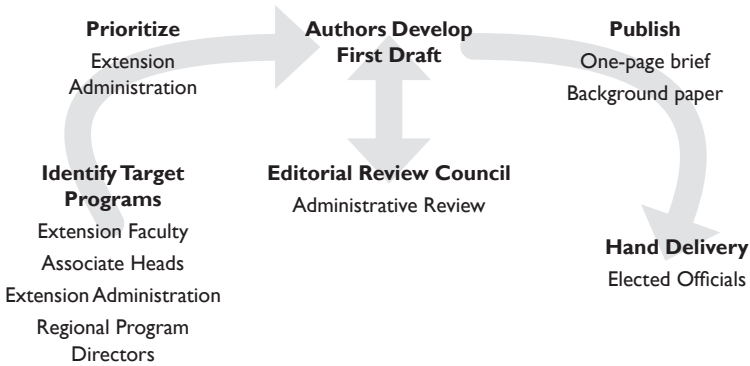
### ***Change in Accountability Climate***

Texas Cooperative Extension (TCE) provides a number of output-related indicators to the state's Legislative Budget Board, a permanent joint committee of the Texas Legislature that develops budget and policy recommendations for legislative appropriations for all state agencies. These indicators include the number of people attending educational programs, demographic information, number of volunteers trained, and teaching methods used. With the continuing growth in the state's population, and increased demands on state government, the Texas Legislature has been looking for new ways to evaluate the performance of state agencies. Since the late 1990s, TCE has been asked by the Texas Legislature to provide estimates of the economic impacts of its programs. More specifically, these requests focus on two types of economic impact: (1) economic benefits to our clientele (the participants in TCE programs); and (2) the number of jobs that have been created because of TCE programs. While this represents a major divergence from traditional accountability information, the TCE administrative team viewed this as an opportunity to showcase the impact of TCE programs.

### ***An Approach to Estimating Economic Benefits***

In response to these legislative requests, TCE created a position in 2004 with the responsibility of leading the effort to quantify the economic benefits of TCE programs. This position, extension program specialist–economic accountability, is located in the Department of Agricultural Economics. Over the course of the past three years, a methodology has been developed for quantifying and communicating the economic benefits of extension programs (figure 1). This position collaborates with extension administration, associate department heads for extension (program leaders), extension specialists, and regional program directors to identify potential statewide and regional programs for economic impact assessment. Programs that are considered for assessment are those that are economically driven. The process of identifying programs is continual and programs identified are then prioritized based on several factors, including the type of data necessary and data availability.

**Figure 1. Schematic of the Texas Cooperative Extension Economic Impact Process**



Once the programs are identified and prioritized, the next step is identifying data needs, data availability, and appropriate analytical method, and then developing the analysis of economic impact. Authors of these analyses typically include the economic accountability specialist, two extension economists, and the extension specialists involved with the extension program being assessed. For each study, a four- to six-page “background” paper is developed. The content of the background paper includes a description of the issue addressed by the program, background information relevant to the issue, a description of the extension program, the economic benefit, and the data and methodology used to estimate the economic benefit. A one-page brief is then written summarizing the important points in the background paper. The briefs are the primary communications tool used with local, state, and U.S. elected officials. The background papers are available to anyone wanting more information than is available in the briefs.

An editorial review council was created to review the studies. The review council consists of three extension economists and one member of the extension administrative leadership team (associate director). The review council and the economic accountability specialist meet periodically to critique and discuss the economic impact studies. The primary purpose of the review council is to identify strengths and weaknesses of each study and to identify any revisions that are necessary. Both publications are edited and published by Texas Cooperative Extension.

The prioritization process, which is primarily needs-driven, involves establishing a sequence for performing the studies. The studies conducted first typically involve those programs that have

the most demand. Since the Texas Legislature meets on a biennium schedule (every two years), the legislative budgeting process starts well in advance of the session and creates the opportunity to communicate the successes of TCE.

## **Economic Concepts**

Like most disciplines, economics has its own terminology and jargon that goes misunderstood by many people outside economics circles. A related problem is that the terminology is often misused, even by some economists, which leads to more confusion by the end user. A detailed discussion of the meaning and application of these terms is beyond the scope of this article, but a general understanding of the following terms is useful to the discussion.

- *Economic benefit*—a broad term describing any benefit that can be quantified in economic terms, such as changes in net income, financial equity, and cost savings.
- *Private benefits*—the economic benefits that accrue to program participants.
- *Public benefits (value)*—the value of a program to those who do not directly benefit from it (*Kalambokidis and Bipes 2007*). For example, a food safety training program for food service providers could reduce the likelihood of patrons contracting a food-borne illness, thus benefiting the patrons even though they didn't participate in the training.

The following terms are all related to economic impact analysis:

- *Economic activity*—dollars spent within a region that are attributable to a given industry, event, or policy (*Watson et al. 2007*).
- *Economic impact*—the net changes in new economic activity associated with an industry, event, or policy in an existing regional economy (*Watson et al. 2007*). With regard to extension programs—which is the “event” in this definition—examples of economic impact would be an increase in profitability of cattle producers or the expansion of the catfish industry resulting from an extension program. There are three primary indicators of economic impact: *economic output*, *value added*, and *employment*.
- *Economic output*—the change in total sales resulting from a change in expenditures (change in demand) in an industry. In the catfish industry, for example, growth in the industry means

that more inputs are purchased, which in turn generates sales for those industries supplying the inputs.

- *Value added*—essentially a measure of net income, such as wages and net business income.
- *Employment*—the number of jobs created.
- *Multiplier*—a ratio used to measure the magnitude of a change in economic activity. Economic impact models are used to estimate multipliers for economic output, value added, and employment.

In general, extension programs can lead to two types of economic benefits: private benefits and public benefits or value. The challenge with public benefits is that they are difficult to quantify. The University of Minnesota Extension has provided significant leadership in the area of public value by articulating public value statements about why certain programs generate public value, without quantifying the value (*Kalambokidis 2004*). Developing statements about public value and quantifying private benefits are both useful methods of communicating the economic benefits of extension programs. In Texas, given our legislative directive for quantifiable economic benefits, TCE has focused its efforts on private benefits.

### **Extension Economic Impact Study Examples**

Since this effort began in 2004, TCE has conducted twenty economic benefit studies on regional and statewide programs. To illustrate the results of some of the studies developed thus far, brief overviews of two studies are presented below. The first study is of the Walk Across Texas program, a Family and Consumer Science program that encourages participants to adopt the habit of regular, moderate-intensity exercise. The second study is about extension's role in eradicating the most devastating insect pest in cotton production, the boll weevil.

#### **Walk Across Texas**

Overweight and inactivity are consistently linked with increased incidence of chronic disease and even death, yet half of American adults are not active enough to be considered in good health. In 2001, only about half of young people between the ages of 12 and 21 reported regular, vigorous physical activity, while 25 percent reported none at all (*Ogden et al. 2002*). The direct and indirect costs of sedentary living are estimated to be \$150 billion, or

just over 9 percent of U.S. health expenditures (*National Center for Chronic Disease Prevention and Health Promotion 2004*). To help people establish the habit of being more physically active, TCE developed Walk Across Texas, a play on the song titled "Walk Across Texas," which encourages families, schools, places of work, neighborhoods, churches, and clubs to form teams of eight for a friendly competition. Since its inception in 1996, more than 85,000 Texans have participated, including over 11,000 in 2006. Evidence suggests that when people walk regularly for eight weeks they are much more likely to continue walking as a regular exercise program.

The economic benefit of Walk Across Texas results from (1) reducing the health care costs associated with heart disease, stroke, diabetes, high blood pressure, and colon cancer and (2) reducing the costs associated with lost productivity and wages. The Walk Across Texas study focuses only on diabetes and the associated lost productivity. Several medical research studies were used in estimating the economic benefit of Walk Across Texas. The future lifetime risk for developing diabetes is 32.8 percent for males and 38.5 percent for females (*Narayan et al. 2003*). As for the effect of increased physical activity on diabetes, one published study found that exercise and weight loss can permanently or temporarily delay the onset of type 2 diabetes in 58 percent of people who are at risk. Based on these findings, 2,409 participants could avoid or delay the onset of diabetes by increasing their level of physical activity (*McCorkle et al. 2007*).

Considering the additional health care cost for a person with diabetes of \$7,601 annually, the average age of diabetes onset of 51 years, and average life expectancy, the present value of the future health care cost savings for 2006 participants is an estimated \$139 million (*McCorkle et al. 2007*). For the cost of lost productivity, a study published in *Diabetes Care* provided data on full and partial missed work days, information needed to estimate the value of lost productivity (*American Diabetes Association 2003*). Using the average wage in Texas, lost productivity was valued at \$7.2 million, bringing the total economic benefits of the program to \$146 million.

### **Eradication of the boll weevil in cotton**

Without a doubt, the boll weevil has been the most destructive insect pest of cotton in Texas and the United States. No other cotton insect pest has caused such devastating yield losses and so negatively impacted the economy of cotton production. The boll weevil largely determined where cotton could be profitably grown in Texas and caused the majority of cotton production to shift from east Texas to west Texas.

Texas joined the national boll weevil eradication program in the mid-1990s. Leading up to this, extension entomologists played a significant role in developing a boll weevil eradication plan for Texas. The plan included eradication tactics used in other states but also reflected the differences in cotton production practices in Texas. While the Texas Boll Weevil Eradication Foundation is charged with implementing the eradication program, extension specialists from several disciplines, the Texas Agricultural Experiment Station, and USDA scientists have been heavily involved in the planning, implementation, and evaluation of the Texas boll weevil eradication program.

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The state was divided into twelve eradication zones and producers in each zone determined participation in the program by a vote on an eradication referendum.

While eradication has not been achieved yet, substantial progress has been made in eradicating the boll weevil from the majority of the state’s cotton-producing regions. To assess the economic impact of boll weevil eradication, statewide estimates of net cash flow for cotton production

were developed for 1996–2005. These estimates utilized annual boll weevil yield loss estimates for Texas provided by the Beltwide Cotton Conference Cotton Pest Loss Database (2006). Utilizing this data enabled the estimation of the yield loss “savings”—that is, the value of production that was once lost to boll weevil infestation. A modified-Delphi process was used with a group of growers and production consultants to elicit expectations about boll weevil insecticide cost savings resulting from boll weevil eradication. The Texas Boll Weevil Eradication Foundation provided data for cotton acreage in each of the twelve eradication zones, and boll weevil eradication assessment fees (Allen 2007).

Acreage enrolled in the eradication program, annual economic net benefits, and cumulative benefits are presented in table 1. Acreage enrolled in the program has grown significantly since 1996 as the benefits have become more evident. The total net benefit has increased from \$18 million in 1996 to \$206 million in 2005, with the cumulative benefits topping \$940 million.

Employment multipliers from the IMPLAN model (MIG 2004) were used to estimate the additional number of jobs supported by the boll weevil eradication impacts. In 2005, the impacts of the

**Table 1. Statewide summary of the net economic benefits to cotton producers of the Texas boll weevil eradication program.<sup>1</sup>**

	Total Acres	Total Net Benefit	Cumulative Economic Benefit
1996	1,476,745	\$18,444,848	\$18,444,848
1997	1,113,748	\$17,315,355	\$35,760,202
1998	1,203,037	\$28,922,518	\$64,682,720
1999	3,892,387	-\$42,334,288	\$22,348,432
2000	4,266,331	\$76,662,917	\$99,011,349
2001	5,803,719	\$125,679,398	\$224,690,747
2002	5,664,936	\$144,237,988	\$368,928,735
2003	5,723,436	\$162,128,300	\$531,057,035
2004	5,982,985	\$209,560,486	\$740,617,521
2005	6,070,076	\$206,283,986	\$946,901,507

*1. Benefits are reported in 2005 dollars.*

boll weevil eradication program supported an additional 2,200 jobs statewide.

## Summary

While applying economic concepts to the assessment of extension programs is not uncharted territory, the effort that TCE has expended in the economic assessment of extension outreach programs is significant. The economic benefit information produced through current methodologies has been well received by elected officials; however, TCE's goal is to develop methodology that will allow for measuring the return on investment for extension funding.

The economic benefit studies described in this article based estimates on different analytical methods, data, and bodies of research. To respond to those that may question the methods used or the reliability of the estimates, every effort is made to maintain a transparent analytical process, with all data, assumptions, and analytical methods explicated in the background paper. With regard to assumptions, which are an inherent part of estimating economic benefits, the philosophy of TCE has always been to be conservative, and realistic, when making assumptions. Considering the target audience is elected officials, it is important to communicate the analytical methods in language that can be understood by a broad audience.

While it is easy to engage in seemingly endless debate over data, analytical methods, and assumptions, the demand for economic accountability information has fueled the development of



an efficient method of developing reliable and defensible economic benefit studies of Texas Cooperative Extension programs. This transparent process has resulted in defensible estimates of economic benefits and impacts, and as a result, has earned the confidence of elected officials in the analysis provided.

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