Taking the Ultimate Step by Placing Economic Values on Extension Program Impacts

John G. Richardson  
Agricultural Programs Accountability Manager  
College of Agriculture and Life Sciences  
Department of Agricultural and Extension Education  
Box 7607 N.C. State University, Raleigh, NC 27695 USA  
Email: john_richardson@ncsu.edu  
Phone: (919) 515-6080  Fax: (919) 513-3935

Charles L. Moore  
Associate Head and Department Extension Leader  
Department of Agricultural and Resource Economics  
College of Agriculture and Life Science  
Box 8109  
NC State University  
Raleigh, NC 27695  
Email: chuck_moore@ncsu.edu  
Phone: (919)515-2607  Fax: (919)515-6268

George J. Young  
Extension Specialist and Professor and  
Coordinator of International Programs for Extension  
Department of Agricultural Economics and Rural Sociology  
203 Comer Hall, Auburn University  
Auburn, Alabama 36849  
E-mail: younggj@auburn.edu  
Phone: (334)-844-3513  Fax: (334) 844-3519

Abstract

Changing trends reflect the desire of policy makers and governments to assure that extension programs produce viable and tangible results. Nearly always, such results when communicated as economic benefits, gain the attention of policy makers, the public, administrators, and the users themselves. Results that are mere descriptions or qualifications tend to be forgotten. Being able to document and defend the economic benefits of these programs are vital for continued public support. This paper presents a rationale for program valuation, ways and means of identifying impacts, and describes the various means for placing economic values on program impacts.

Twelve different means of placing values extension programs are presented. Such valuation means may be multi-faceted or may be valued using a single means. These are: Reduced costs, Increased income, Savings, Increased productivity, Value added, Expected values, Alternative opportunity cost of capital, Willingness to pay, Multiplier effect, How we are better off, Non-market benefits (cost effectiveness), and Indirect values. Each of these means of valuing is described by using actual extension program examples. Some examples of program success stories that involve estimating the economic value of programs are also presented. These success stories and actual program examples are intended to provide extension workers with tools required for recognizing and reporting the economic value of their successful Extension programs as well as providing the means for selecting appropriate methods for valuing those program successes.
Introduction

The literature from around the world produces a steady stream of information about extension relating to budget reductions, poor results, and the trends toward privatization or alternative systems. The changing trends reflect the desire of policy makers and governments to assure that extension programs produce viable and tangible results. Nearly always, such results when communicated as economic benefits, gain the attention of policy makers, the public, administrators, and the users themselves. A U.S. Congressional oversight committee indicated that regardless of the inherent benefits of a program only those impacts that contain quantified results remain in the public mind. Results that are mere descriptions or qualifications tend to be forgotten. Therefore, identifying extension program impacts and subsequently placing economic values on them are two very valuable aspects of documenting the value of extension educational programs. Being able to document and defend the economic benefits of these programs are vital for continued public support.

(b). Purpose

This paper presents a rationale for program valuation, ways and means of identifying impacts, and describes the various means for placing economic values on program impacts. Through cost benefit analysis, one identifies, quantifies, and evaluates all the positive factors resulting from an educational program as compared to its cost. Actual examples of extension success stories are presented in which agents have effectively communicated the economic values of the program outcomes.

(c). Issue

Program accountability continues to receive greater emphasis by policy makers and those who fund all program efforts as it has over the past several years. To accentuate this, the US Congress passed a law in 1998 that is very strict in its requirements that extension and research programs that are funded by USDA must demonstrate evidence of impacts and stakeholder involvement. Other governments in many parts of the world have gone further by privatizing their extension systems or significantly restructuring them in an effort to make sure that funds expended for extension services are indeed producing desired results. Environmental, social, and economic changes have been widely identified as the desired ultimate outcomes of extension programs. Moreover, by placing economic indicators (values) on the program impacts, the benefits of the program can be more easily evaluated and justified, in that cost effectiveness of programs can be shown to convince funders that continued funding is most prudent.

(d). Discussion

This paper articulates twelve different means of placing values extension programs. Such valuation may be multi-faceted or it may be valued using a single means. However, regardless of the number of methods used, knowledge of and understanding of the utility for each method should be in each extension worker’s tool kit for assuring that program benefits are adequately presented in an economic perspective. Those twelve means of program valuation along with examples of the educational outcomes for each are presented under the following twelve headings.
Reduced costs

This popular means of program valuation has been used for many years by Extension personnel to estimate the economic value that program participants gain by changing behaviors or practices resulting from the organization’s educational programs. Cost savings or reduced expenditures that participants realize can often be easily identified in determining the economic impact of programs. For example, the value of a program to educate people on how to “comparison shop” could be the amount of savings realized by purchasing “generic or store labeled” brands compared to “name” brands of merchandise.

Estimating the value of a soil fertility program, such as soil sampling education, can be the dollars saved when basing application rates on the recommendations from the sample analysis, rather than indiscriminately applying higher rates. Another example of the ‘reduced cost’ method of program valuing could be the amount of reduced interest realized by program participants resulting from refinancing their home mortgages in response to an Extension educational program on refinancing.

Increased income

Many times, Extension programs help participants gain new skills that enhance their job prospects, lead them to adopt innovative practices that increase yields or make other decisions that cause them to increase their income. The value of these programs is the increased income.

For example, through a family financial management program, a participant might learn about the benefits of investing in money market savings accounts rather than regular savings accounts. If, as a result of the program, participants shift their funds to money market savings accounts, the estimated value of the program could be the extra income earned as a result of the higher interest rate they earn.

Similarly, one can estimate additional income gained by producers who, as a result of Extension programming, adopt new or alternative enterprises that enable them to use available resources more efficiently. To estimate the program's value, one can compare participants' income levels before and after the program.

Savings

The implementation of a logical and sustained savings plan is recommended to help families and individuals be prepared to meet and overcome financial emergencies. Such a savings plan may ultimately result in an accumulation of sufficient funds for other investments or to fulfill a lifelong dream. Consumer economists recommend various savings rates. The amount that is recommended to have accumulated in an accessible account to meet “emergency” or unanticipated financial needs is three to six months of salary. For future consumption purposes, it is generally suggested that a person try to save 5 to 10 % of one’s salary.

There are a number of Extension programs that focus on savings enhancement education, and the amounts of increased savings experienced by program participants can be considered the estimated value of the program.
**Increased productivity**

This means of program valuation is a common practice in much of business and industry as well as agriculture. Productivity is defined as units of “output” or product produced per unit of “input” or resource used. Consequently, any practice, process, or innovation that either increases units of output in this formula or reduces the units of inputs would result in increased productivity. Such increases in productivity, i.e., greater quantities of a product being produced by the same number of workers, may be due to installation of more efficient machinery or some improved practice or procedure being implemented. Covering more acres in the same or less time with the same number or fewer employees is an example of increased productivity per unit of time per employee. Larger or more efficient equipment often increases the level of productivity of a farm operation. Obviously increased crop yield per acre would be an example of increased productivity per unit of land. The difference between the value gained from the increased efficiency resulting from the adoption of a new practice, and the costs required for obtaining the new efficiencies, would be a good estimate of the value of educational programs causing such efficiency gains.

Computer systems are often touted as excellent contributors to greater efficiencies, as supplies or inventories are constantly matched with the number of employees needed at any given time, to complete a given task. Managers of businesses such as restaurants, food stores, and many retail businesses are able to staff and maintain inventory more efficiently as a result of having enhanced computer systems. Thus, comparing sales and profits from the business prior to adopting computer technologies with sales and profits after adoption will provide an estimate of the value of the new technology. The differences between the gains realized from the increased efficiencies and the cost of the new technology would be the estimated value of the Extension programs that resulted in such changes being adopted.

**Value added**

The term *value added* is often used to reflect increased value gained from using a product in a new way or from modifying an existing product in a way that generates more profits for the business. For example, a sawmill adds value when it decides to produce finished products, rather than selling all of its production as rough lumber. To estimate the value of an Extension education program that provides the knowledge and skills for mill operators to finish lumber, one could calculate the difference in the value of the rough lumber compared to the finished lumber, minus the costs associated with the finishing process.

Another example of value added is when a farmer chooses to use the grain produced on the farm as feed for livestock rather than selling the coarse grain. This alternate use can significantly improve the returns per bushel of grain produced. One can use the difference in per-bushel returns to estimate the value of an Extension program that resulted in the farmer using his grain in an alternative manner.

Yet another example of a value added product is specialty foods or foods wrapped for convenience or attractiveness. Individually packaged products often cost considerably more than bulk products, but many consumers are quite willing to pay for the convenience or perceived higher quality of the smaller quantity or specially packaged product. The increased value can be used as an estimate of the monetary impact of the Extension educational programs that helped the business capitalize on packaging and other market development opportunities.
Expected values

To use this method of estimating program value, one needs to have some knowledge of the end products or results that are expected to result from the educational program. For example, the value of a program to help people start home-based business may be the projected income generated by the new business. That income can be based on the known history of similar ventures. For example, participants who start a tourist enterprise or bed-and-breakfast can use data from similar enterprises to project levels of use as well as anticipated income flow.

For essentially all commercial or agricultural loans, lending institutions require an estimate of anticipated cash flow in order to evaluate loan applications. Such estimates of expected additional income as a result of a new venture can be used as an estimate of the value of educational programs focusing on alternative enterprises.

Alternative opportunity cost of capital

Extension educators provide clients with information on ways to reallocate available funds within their businesses to produce a greater level of return. That higher rate of return can be used to estimate program value. For example, if a farmer had a choice of investing in machinery to produce major cost savings or investing the same funds into a regular savings account, the difference in the value of the net income realized from the cost savings of the machinery compared to the interest earned from the savings account would reflect the value or benefit in making that decision. This increased income would be a good estimate of the economic worth of the educational program that led to the decision.

Willingness to pay

The willingness of clients or consumers to pay for some item or service may be considered an economic benefit when this willingness exceeds what would be considered a standard norm for a product or service. Some consumers are, for example, willing to pay more for bottled water than tap water because they think bottled water is more convenient or pure. While a pint of water costs only pennies, some consumers are willing to pay considerably more for the same amount of bottled water. This perception of improved quality of products can be parlayed into additional income gained through improved product packaging or presentation of vegetables or fruits in attractive farmer’s markets displays. Such increased income associated with consumers’ willingness to pay can be used to estimate the monetary impact of educational programs that focus on helping individuals and businesses capitalize on packaging and other market development opportunities.

Similarly, people are often willing to state how much they are willing to pay for certain recreational opportunities. Such stated willingness-to-pay could serve as the basis for estimating the value of educational programs exploring the benefits and cost of activities such as trail development, agritourism, or similar recreational ventures.

Multiplier effect

This term is often used in economic development circles. Oftentimes, when new money is introduced into a community as a result of economic activity, whether from the start up of new businesses or expansion of existing businesses, there is a greater demand for other goods and
services in the community. This can, in turn, result in more new businesses. The "multiplier" is, then, the number of times that the initial dollar of economic activity causes additional dollars to be generated in the community. The estimated value of the Extension program that stimulated the initial increase in economic activity could be the total value of additional goods and services being generated. Often, such multiplier effects are projected at two to three dollars gained in further benefits to the economy for each dollar earned in a newly created job.

**How we are better off**

Changes in habits, lifestyles, practices, infrastructure, and physical and social environment, often have significant impacts on our well-being. Removal of obvious hazards, improvements in physical surroundings, and changed behaviors resulting in reduced illnesses or increased life expectancy, are all factors that can reflect the economic value of educational programs.

Safe driving records usually translate to lower insurance premiums for safe, accident-free drivers. Those drivers with less than stellar driving records usually pay higher rates. Even a single driving violation can dramatically impact the amount of a person’s insurance premium. In this regard, the value of driving safety programs may be estimated based on these reduced costs for insurance, as well as reductions in pay-outs due to accidents which cause property loss, injury or death. Worker safety programs impact the safety and well-being of employees. The value of such worker safety programs can be estimated based on the reduced medical expenses associated with accident caused injuries and deaths and the costs avoided from the lost productivity of injured workers.

When valuing Extension safety programs, it is important to recognize that the insurance industry must continually place values on lives and serious injuries. Jurors in courts of law are constantly being asked to determine the economic value to be placed on persons’ lives that have been killed in accidents. These decisions may be quite variable, and are often based on a prediction of one’s future earning capacity, stage in life, education level, career and professional achievements, and on the whims of jurors themselves. Such decisions form the framework for establishing public policy regarding the level of expenditures that governments will allocate to the protection of human lives.

With the statistical valuing of human life as a given, placing economic values on the impacts of educational programs that result in people adopting safer driving and living habits is certainly a task that can be accomplished with a high level of confidence. Adopting practices that result in safer driving, improved eating habits, improved water quality and safety, increased seat belt use, safer pesticide handling, and numerous other behaviors are examples of changes that impact the protection of human life. The value of such changes in behavior can reasonably be quantified using statistical values ascribed to human life, injury, and health.

**Non-market benefits (cost effectiveness)**

Extension programs often produce very tangible changes in human behavior that can be identified, but not easily valued due to their non-market nature. Examples of these non-market benefits are usually changes (increases) in a person’s education level, changes in one’s aspirations or attitudes, improvement in one’s quality of life, self-esteem, or major leadership skills and abilities. While none of these changes lend themselves nicely to economic valuation, statistics have shown historically that on average, persons with higher levels of education have
higher earnings than less well educated persons. Further, persons with high levels of self esteem and demonstrated leadership skills often experience greater success in society. As has been demonstrated with the correlation between higher levels of education and lifetime earnings, statistical projections of estimated future value may be placed on many of these examples of positive behavioral change resulting from Extension human development programs.

It is often difficult to estimate the economic value of the impacts of educational programs that focus on human development or producing social change but that do not have direct market value (cannot be bought or sold). However, such changes have been studied and values projected for these changes. These values can be used in estimating the value of Extension programs that produce such identifiable change. For example, the United States Census Bureau produces estimated values of different education levels in average lifetime earnings for the respective levels.

**Indirect values**

Indirect values are often difficult to assess without considerable study by economics experts. Also, such indirect benefits may be affected by numerous factors well beyond the scope or influence of the educational program. When attempting to value the results of a program beyond its most immediate results, such values may be questionable at best, especially if the valuation is being done by persons who are not recognized valuation experts.

An example of the difficulty of estimating indirect values could be determining the value of refrigeration equipment sold to provide better protection for food in a restaurant. Part of the motivation to purchase the equipment may be assumed to be a result of Extension certification programs for food handlers. While the primary program goal was to assure food safety through proper food preparation and handling practices by restaurant or other food service workers, in reality, the equipment may have simply been a replacement of old equipment or merely a step toward expanding the restaurant’s business. On the other hand, the purchase of the new equipment may have been the result of a visit by a very good refrigeration equipment salesperson.

Care must be exercised in determining the value of any Extension program, but especially programs having indirect impacts. Unless indirect values can be clearly identified as resulting from a specific program impact, such indirect valuation should generally be avoided or at least approached very cautiously.

**Summary**

This paper is intended to give some insights into the process of estimating economic values for Extension program impacts. While savings, increased income, and reduced costs may be more familiar to Extension workers, the other means of valuation that are discussed may be more useful and appropriate for assessing the value of many educational programs and their resulting impacts. While a few examples are provided, the reader of this document will likely have many more examples that fit more appropriately the respective valuation methods discussed.

While some of the valuation methods may be relatively easy to use, other methods may be found to be more complex or difficult to define and/or to locate sources of appropriate values. Fortunately, during recent years, the Internet has provided a new and vast opportunity for
locating specific values associated with a broad array of entities. For example, the values associated with the benefits of breastfeeding are quite numerous on various Web sites. A brief Web search is often all that is required to obtain valuation information that may be needed. The example used in this document of U. S. Census Bureau projections for average income associated with different levels of education demonstrates that the Web is a reliable source of valuation information. While brief Web searches may be a convenient method for locating respective valuation information, keep in mind that not everything on the Web is valid. Extension specialists or other experts can be reliable sources for information on appropriate values for many program outcomes, and should be consulted to assure that estimated program values are realistic and valid.

The process of valuing Extension educational programs has been a standard practice among many for several years. However, as the ever-increasing need for program impact information is required for organizational and programmatic accountability, much greater attention is being given to the quantification of values of impacts resulting from Extension educational programs.

Some examples of program success stories that involve estimating the economic value of programs are presented below. These success stories were prepared and submitted by extension agents in North Carolina, and were among 2,300 other success stories submitted during the year of 2003. The final story was produced by Extension Specialists in Alabama. We have identified the most predominant means of valuation used in each of these success stories.

Communicating Program Value Through Success Stories

Location: Caldwell  
**[Increased income]**

Many small and limited-resource farmers are constantly looking to diversify their agricultural enterprises in order to stay in business. One area for potential growth in the foothills and mountains is in the green industry. During 2002, 131 small and limited-resource farmers received information on growing nursery and greenhouse crops as value-added products through workshops and personal consultations. Of the 131, 27 have diversified or expanded into the green industry. As a result, 324 acres are in production resulting in an increased total income of $291,600 for the 27 farmers.

Location: Robeson  
**[Reduced costs] [How we are better off]**

Robeson has the 2nd highest diabetes mortality rate in NC for primary cause. Afro- and Native Americans, majority of Robeson's population, have a higher diabetes rate than Caucasians. Robeson County Cooperative Extension partnered with the Health Dept. and 4 minority churches in 2002(4 were completed in 2001) in conducting diabetes educational classes and grocery store tours. 71 consumers participated. According to follow up behavioral change surveys, 69% had improved foot care and 79% had made dietary changes to better control their diabetes. One congregation used class information to revive a member experiencing low blood sugar. One man relieved foot numbness by using correct walking step. In follow up conversations, several participants commented on increased label reading and used correct diabetic terminology. Nutrition intervention is believed to contribute to health care savings ($5400 per person); thus this instruction saved an estimated potential of $383,400.

Location: Hoke  
**[Reduced costs]**

According to the Department of Juvenile Justice, Hoke County is a "target county" because a large number of youth are sent to training school. Between January and May 2002, it has cost the county $25,272 to detain youth. To address the character and decision making skills of youth, Cooperative Extension offers a prevention program called 4H Life Skills. Cooperative Extension collaborates with Hoke County Schools to offer the program to elementary and middle school students. The program has reached 158 students this year and none of the students who have graduated from the program have been referred to juvenile justice. For each child not referred to juvenile justice, the county saves $72.00 a day and $26,280 a year.
Location: Chowan

- **[Expected value]**
- **[How we are better off]**
- **[Increased productivity]**
- **[Increased income]**

2002 was an extremely dry season for all of the counties' row crop and vegetable farmers. Because rainfall was extremely short of providing crop needs, growers were increasingly dependent on the abundant surface waters of the Chowan River and the Albemarle Sound. The sound and river become increasingly salty over time when rainfall is limited. Monitoring for salt concentration was initiated in late May and continued through the growing season. Salt concentrations were reported in newsletters and made available on request. Concentrations became high enough (3000ppm) that continued irrigation would cause crop damage. Cooperative Extension implemented an educational program focusing on Salt Concentration Monitoring that enabled growers to make informed decisions on irrigation timing and frequency and avoided a potential 20% loss in yield. On approximately 10,000 acres of irrigated crops, this could have amounted to a $800,000 loss.

Location: Iredell

- **[Reduced costs]**

Poultry growers in Iredell, Alexander, and Wilkes Counties have been assisted by the North Carolina Cooperative Extension Service in Iredell County to properly manage the waste produced on their farms. 87 growers were able to realize a cost savings of $1,142,970.00 in commercial fertilizer cost by utilizing poultry litter as the nutrient source for crops grown on their farms. Growers were assisted in litter analysis, soil testing, and crop nutrient requirements. 3529 acres of crop land and 15,676 tons of litter were analyzed and applied according to agronomic rates and in an environmentally friendly manner.

Location: State of Alabama

- **[Reduced costs]**

The annual Alabama Extension publication, Alabama Farm Analysis Association Summary Report, provides detailed cost and return information on the 10 major farm types in Alabama, for the past five years. This documentation of actual farm profit and loss history is valuable not only to farmers in their business planning tasks, but also helpful to agricultural lenders and agricultural policy makers. Anne Payne, chairperson of the Alabama Agribusiness Council wrote in 2003 that having this information to share with the Alabama Legislature resulted in Alabama farmers not being subjected to 61 million dollars, per year, of proposed sales tax increases. This is quite a benefit to Alabama's agricultural industry in that the public cost associated with gathering the data for this publication is about $ 100,000 per year.

(e). Educational importance, implications, and conclusion

The intent of this paper is to provide extension workers with tools required for recognizing and reporting the economic value of their successful Extension programs as well as providing the means for selecting appropriate methods for valuing those program successes. Cooperative Extension agents in North Carolina as well as extension professionals in attendance at the system-wide Association of Extension Administrators for 1890 Land Grant Institutions Conference in Atlanta, Georgia in June of 2003 have indicated their appreciation for such valuation information and training. The importance of such information has been indicated by testimonials such as comments made by the chair of the conference who indicated “…I heard many positive comments about your session on, Measuring Impacts - How to Transfer Numbers Into Economic Benefits. Measuring impacts by showing economic benefits will certainly be a critical factor when delivering educational programs in the 21st Century. The information provided in your session was well received by the participants, as reflected in the conference evaluation.”

As indicted in the examples above, Extension agents in North Carolina are also demonstrating increased knowledge and skills in writing success stories and placing values on them as indicated by the increasing number of such stories posted in the Extension Reporting System operated by the North Carolina Cooperative Extension Service. Such strong stories are being used by extension administrators at the local, state and national levels in providing substantial justification for continued funding of extension programs. There is little reason to suspect that such presentation of program impacts would not be a strong statement to policy makers and others around the world in gaining support for extension program efforts.
References


Acknowledgement

Grateful acknowledgement and appreciation is expressed to the following persons who contributed their knowledge and thoughts in the development of this paper: Michael L. Walden, Department of Agricultural and Resource Economics; David M. Jenkins, Personal and Organizational Development; Carol Schwab and Judy Mock, Department of Family and Consumer Sciences; Dee Shore, Department of Communications Services; Edwin Jones, Agricultural and Natural Resources Programs; Donald Cobb, District Extension Director; Joy Staton, County Extension Director, North Carolina Cooperative Extension Service, North Carolina State University; and Joyce Dolbier, Communications Specialist, University of Florida.