FINAL 9-10-2014

THE UNIVERSITY of TENNESSEE KNOXVILLE

APAC

Program Review

Blasingame Chair of Excellence in Agricultural Policy 1991-2014

Agricultural Policy Analysis Center (APAC), 309 Morgan Hall, 2621 Morgan Circle,
The University of Tennessee, Knoxville, TN 37996, ph: 865-974-7407, http://agpolicy.org

PROGRAM REVIEW

BLASINGAME CHAIR OF EXCELLENCE IN
AGRICULTURAL POLICY
DEPARTMENT OF AGRICULTURAL AND RESOURCE ECONOMICS
THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Coordinated by:

Delton Gerloff, Department Head for the
Agricultural and Resource Economics Department

Review Panel:

External Reviewers-
Joe Outlaw, Texas A&M University
Bob Young, American Farm Bureau Federation
Pat Westhoff, Food and Agricultural Policy Research Institute

Internal Reviewer-
Matt Murray, Baker Center

September 8-10, 2014

APAC Program Review
September 8-10, 2014

September 8 – Review Committee Arrives in Knoxville

Upon Arrival, Check in to Hotel (Cumberland House; 1109 White Ave; 37916)

6:30 p.m. – Dinner, Calhoun's on the River

September 9 – All Meetings in 301 Morgan Hall

8:15 a.m. – Pick up at Hotel and transport to Morgan Hall

8:30 a.m. – Initial Meeting with UTIA Administration: Dr Larry Arrington, Chancellor, UTIA

9:15 a.m. – Overview of Review and Current APAC Situation, Gerloff

10:00 a.m. – Break

10:15 a.m. – APAC Faculty and Staff

Julie Goldman, Administrative Assistant

Brad Wilson, Computer Programmer/Analyst

Dr. Lixia He Lambert, Research Scientist

Dr. Chad Hellwinckel, Research Assistant Professor

Dr. Harwood Schaffer, Research Assistant Professor

Dr. Daryll Ray, Blasingame Chair, APAC Director

11:15 a.m. – Committee Review

12:00 noon – Catered Lunch

1:00 p.m. – Faculty of the Department of Agricultural and Resource Economics

2:00 p.m. – UTIA Administration

Dr. Caula Beyl, Dean, CASNR

Dr. Bill Brown, Dean UT Ag Research

Dr. Tim Cross, Dean, UT Extension

Dr. Robert Burns, Assistant Dean, UT Extension

Dr. Stephen Oliver, Assistant Dean, Ag Research

Dr. John Stier, Assistant Dean, CASNR

3:00 p.m. – Break

3:15 p.m. – Dr. Daryll Ray, Blasingame Chair, APAC Director

4:00 p.m. – Committee Planning, Day in Review

6:00 p.m. – Dinner with UTIA Administration, Chesapeake's

September 10 – All Meetings in 301 Morgan Hall

8:15 a.m. – Pick up at Hotel and transport to Morgan Hall

8:30 a.m. – Committee Free Time to Call in Individual Faculty, Staff, Administration for further discussion

10:00 a.m. – Meet with Off-Campus Ag Leaders

12:00 noon – Catered Lunch – Committee and guests

1:00 p.m. – Committee working on report.

2:30 p.m. – Committee present preliminary report to APAC

3:15 p.m. – Committee present preliminary report to Administration

4:00 p.m. – Transport committee to airport

Note: Committee will send final report no later than 4 weeks following the on-campus review.

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Introduction

The Blasingame Chair of Excellence in Agricultural Policy was made possible by a lead gift from Benard and Margaret Blasingame in 1989. Blasingame, a native of Selmer, Tennessee, was president and founder of Aqua Glass Corporation in Adamsville, Tennessee. The Chair position is housed in the Department of Agricultural and Resource Economics, UT AgResearch, University of Tennessee Institute of Agriculture (UTIA), Knoxville, Tennessee.

The national search for the Chair position began in late 1989, culminating in the naming of Daryll Ray as the first holder of the Blasingame Chair of Excellence in Agricultural Policy. His appointment began on September 1, 1991 and he has continued in the position to date. This is the first comprehensive review of the Blasingame Chair Program. This document is intended to provide information about the Chair and the Chair Program that is useful to the review panel, university administrators, and other interested parties as they evaluate the unit's strengths, challenges, and future possibilities.

While the review is of Chair or the Chair Program, the unit is best known as the Agricultural Policy Analysis Center (APAC). As a means of focusing attention on the unit and for ease of identification, the APAC name was created by the Chair-holder shortly after he arrived on campus. Also, the APAC moniker suggests that a team of people are part of the unit not just the Chair-holder. It is the Blasingame Chair of Excellence in Agricultural Policy name that appears on the endowment and university budget forms. In this document the unit will be identified interchangeably by the official chair name, the Agricultural Policy Analysis Center, and APAC.

Original Purpose and Objectives

Generally a review of a unit, regardless of type, is performed within the context of the unit's purpose or reason for being. In some cases that context is obvious but in other cases it may not be as obvious. Perhaps, in the case of this review, a natural place to start is with the Position Announcement for the Chair, which was drafted by an ad hoc committee of the Department of Agricultural Economics and Rural Sociology. In addition to the Position Announcement, the ad hoc committee produced a written report entitled: "THE PLAN FOR EXCELLENCE." This brief report expands the job-description section of the Position Announcement with discussion of the motivation for the Chair, the breadth of its clientele, the diversity of needed outreach/communication vehicles, alternative research concentrations, and suggested resource configurations for the Chair Program. Taken together, these two documents characterize the general nature of the position as understood by the Blasingame Chair appointee, although specific elements may differ due to prior negotiation or varied emphases over time.

The four objectives listed in the Position Description section of the Position/Job Announcement are reproduced below in bold type. Additional descriptive information from the position announcement (PA) or the planning document (PD) appears after most of the numbered objectives. All the text for the rest of the objectives section is taken directly from the documents.

1. **To identify and conduct research on current issues relating to resource policy, commodity policy, rural development policy, and international policy**.

   We feel that the individual hired in this position should have breadth enough to understand potential research problems in each of these policy areas. …[and] would be capable conducting policy analysis and research in each of these areas with heavy concentration in more than one of the policy arenas. (PD)

   The position has the flexibility to permit the chair to initially concentrate on one or more of these areas, expanding to the other areas as supporting research funds become available. The chair will be expected to secure grants and/or contracts to supplement the resource support for the program and to work with other faculty members in the department when appropriate. (PA)

2. **To develop analytical models appropriate for analysis of existing or proposed programs at the state, federal, or international level to determine potential economic impacts on the system.**

3. **To present research results in various forms so as to contribute to formation of governmental policies and programs dealing with agricultural commodities, natural resources, and international trade.**

   Candidates must have demonstrated the ability to conduct research and to convey the results and their implications to decision-makers, industry, and other parties of interest. (PA)

   The individual is encouraged to deliver his/her findings to the public, state institutions, agricultural interest groups, and to farmers. (PD)

4. **To participate in the graduate program by teaching and supervising master and doctoral level students.**

   Candidates must have an interest in teaching and display evidence of strong teaching ability. Candidates must have demonstrated success in directing graduate students and in administering external grants in support of research. (PA)

Reasons for Being/Why Created

Clearly, the usual reasons for creating a Chair position in the Agricultural Economics Department broadly apply in the case of the Blasingame Chair, including providing additional prestige to the department, expanding the department's resource base, providing a topical focal point for the department, honoring the recipient of the chair position and so on. But why create a chair in agricultural policy, aside perhaps from the donor's interest in agriculture and agricultural policy?

The planning document provides an insight: "As a result of Departmental makeup, the lack of research in the traditional commodity policy area is glaring. There is no one currently

evaluating proposals for the 1990 Farm Bill. Little attention is paid to the contributions agriculture makes to the State of Tennessee. In the report to the Governor provided by the Center for Business, Tennessee agriculture is represented by a single equation." (PD)

Perhaps the strongest statement concerning the need/justification for the policy chair appears in the planning document: "It is felt that the state needs an independent thinker addressing pertinent issues of today and those likely to occur in the future." (PD)

Many of the expectations of the Blasingame Chair program are similar to those of a typical agricultural economics research and teaching position. Common expectations could include: development of a nationally/internationally recognized research program; actively participate in the teaching program; supervise graduate students; collaborate with extension personnel; acquire substantial extramural funding; participate in service activities of the department, college, and university; and publish research results in peer-reviewed journals.

Journal publications are, of course, a key evaluative component of faculty positions. The Blasingame Chair Program is expected to communicate with academic peers via papers at professional meetings and in peer-reviewed journals. Those output expectations appear as a bullet point in one of the tables in the planning document. This is mentioned only because the documents describing the Blasingame Chair Program so strongly emphasize the importance of communicating research results to those who influence, or who are most affected by, agricultural policy.

Personnel and Resources

The Blasingame Chair Program staff originally included 4 research associates, a computer programmer, an editor, an administrative assistant and, typically, an undergraduate assistant plus graduate assistants. Over the years the composition of the unit's staff has changed considerably. For example, the four research associate positions were converted to two tenure track positions within APAC (for Daniel de la Torre Ugarte and Kelly Tiller); the editor position became a research associate position.

In 2007, the UTIA administration appointed Kelly Tiller to be the Director of External Operations of UTIA's Office of Bioenergy Programs. She later became President and CEO of Genera Energy LLC, a for-profit limited-liability company of the UT Research Foundation, and Biofuels Technology Manager of the University of Tennessee Research Foundation. Just prior to being tapped for the UTIA and Foundation positions, Kelly became Director of the Center for Tobacco Grower Research (CTGR) as part of her position in APAC; she retained a minor role in the Tobacco center until (2014).

In 2014, Daniel de la Torre Ugarte retired from the University of Tennessee and moved back to his home country of Peru. He will be available to collaborate on future APAC research projects on a part-time basis.

While working as research associates in APAC, Harwood Schaffer and Chad Hellwinckel earned their masters degrees in our department and then pursued PhDs, Harwood in Sociology, specializing in rural political economy, and Chad in Geography, specializing in

Agricultural Geography and Soils. After completing their doctorates, Chad and Harwood were promoted to Research Assistant Professors. These are non-tenure track faculty positions funded exclusively by grants and contracts.

Exclusive of the chair-holder and vacant faculty positions, the current configuration of the Blasingame Policy Chair Program staff is: Administrative Assistant: Julie Goldman; two Research Assistant Professors: Dr. Chad Hellwinckel and Dr. Harwood Schaffer; Research Scientist: Lixia He Lambert; Computer Programmer/GIS Specialist: Brad Wilson; Visiting Scholar from China: Mei Yan; and graduate assistant: Chuck Grigsby.

APAC Budget

Budgeted expenditures for the Agricultural Policy Analysis Center come from three sources: the Blasingame Endowment, UT AgResearch, UTIA, and grants and contracts. The endowment typically accounts for 7 to 10 percent of APAC's expenditures with the balance divided roughly equally between the other two. For example, during fiscal years 2007 to 2014 (fiscal years end on June 30 of the identified year), years for which comparable data are readily available, expenditures by the Agricultural Policy Analysis Center averaged $889 thousand with 8 percent coming from the endowment, 46 percent from UT and 46 percent from grants and contracts. Of those expenditures, an average of 85 percent was for salaries plus fringe benefits for APAC personnel, 3 percent for travel and 12 percent for operating expenses. When at full staff, APAC annual expenditures tend to be about $1 million per year with grants and contracts accounting for a somewhat larger portion (about half) of expenditures.

Grants and Contracts

Grants and contracts are important funding sources for all aspects of the Blasingame Policy Chair Program. Table 1 summarizes grants and contract award totals by general research areas. The award totals cover the entire period of the Blasingame Policy Chair Program (September 1991 to present). They include the full award amounts when an APAC faculty person was the Principal Investigator or a Co-Principal Investigator but only the portion spent by APAC for other grants and contracts in which no APAC faculty person was a PI or Co-PI. Forty five percent of the grants and contracts have been for bioenergy-related research. Tobacco-related research received the next largest amount, followed by climate-change research and general macro agricultural policy research. Table 2 is a list of the agencies and organizations that have made grant and contract awards to APAC

Table 1. Grant and Contract Awards by Broad Categories

Research Areas	Total
Bioenergy Related	$5,098,399
Climate Change and Carbon Sequestration	$1,448,982
General Macro Agricultural Policy Analysis	$1,044,823
Farm Level Analysis	$156,150
Tobacco Policy	$2,608,285
Cotton Policy	$109,805
Other	$873,888
TOTAL GRANT FUNDING	**$11,340,332**

* The grant and contract numbers include the full award amounts when an APAC faculty person was a Principal Investigator or a Co-Principal Investigator and only the portion spent by APAC for other grants and contracts in which no APAC faculty person was PI or Co-PI.

Table 2. Funding Agencies and Organizations, 1991-2014

Agriculture and Food Research Initiative (USDA)	OnLocation Inc.
Agriculture Energy Work Group	Oxfam America
Altria	Pacific Northwest Lab
American Corn Growers Association	Pew Foundation
Better World Fund	R.J. Reynolds Co.
Bipartisan Policy Center	Phillip Morris
Burley Stabilization Company	SARE (USDA)
Cotton, Inc.	Shell Hydrogen
Economic Research Service (USDA)	South Dakota State University
Farmers Education Foundation	Sun Grant
Food & Water Watch	Tennessee Valley Authority
Howard G. Buffett Foundation	U.S. Department of Energy
Iowa State University	U.S. Department of Transportation
Knox County	U.S. Environmental Protection Agency
Leopold Center	U.S. Forest Service (USDA)
National Commission on Energy Policy	University of Arkansas
National Institute of Food and Agriculture (USDA)	University of Kentucky
National Research Initiatives (USDA)	University of Virginia
Natural Resources Conservation Service (USDA)	UT Foundation
Oak Ridge National Laboratory	UT-Battelle
Office of the Chief Economist (USDA)	Virginia Polytechnic Institute and State University

Summary of Blasingame Chair Program Activities, 1991 to Date

The objectives listed in the position announcement for the Blasingame Policy Chair are used as the organizing framework to summarize the activities and of the Chair Program/Agricultural Policy Analysis Center. Using abbreviated identifiers, the four objectives are 1) Research Areas, 2) Analytical Tools, 3) Communication to Clientele, and 4) Teaching.

Since most of the Research Areas use one or more of the analytical models that have been developed or expanded by APAC, the Analytical Models section appears before the section on Research Areas.

Analytical Tools

POLYSYS

The primary analytical model used by the unit, POLYSYS, draws heavily on models previously developed by the chair-holder. The first model, developed as part of his dissertation research, became the basis for the early econometric policy simulation analyses at the Center for Agricultural and Rural Development (CARD). It was the first national econometric policy model to include all the major crop and livestock categories, but its hundreds of econometrically estimated equations made it burdensome to maintain and keep updated.

A second model, called POLYSIM, combined the use of elasticities and other response parameters with "baseline" projections of national crop and livestock supply and demand data to simulate conditions and policies different from those embedded in the baseline projections. The requisite ten-years-into-future baseline projections are produced and published annually by the U.S. Department of Agriculture, the Food and Agricultural Policy Research Institute (FAPRI) and the Congressional Budget Office (CBO).

By tying analyses to baseline projections, decision makers can compare the impacts of a policy change or changed economic condition away from a known set of published information. This model, developed while the chair-holder worked at Oklahoma State University, was the first multi-commodity agricultural policy simulation model used by the Economic Research Service of the U.S. Department of Agriculture. Also during this time, first stochastic, multi-commodity national agricultural policy simulation model was developed by Daryll Ray. Prior to arriving at UT, he completely rewrote POLYSIM for use on microcomputers.

An enhanced and expanded version of POLYSIM, renamed POLYSYS, has been and continues to be, the major analytical engine of the Agricultural Policy Analysis Center. A large share of the unit's grants and contracts depend on the availability and adaptability of the POLYSYS model.

Enhancements over the years include 1) the addition of bioenergy dedicated crops, 2) allowing for the use of cropland for forestry production, 3) added detail for the model's livestock commodities, 4) the incorporation of new/modified policy instruments, disaggregating the supply side of model crops into 305 Agricultural Statistics Districts and then to watersheds and counties, and 5) the linkage of POLYSYS to resource data and physical process models such as FLARE, SWAT, EPIC, and to economic impact models such as AGLINK/COSIMO, and IMPLAN.

The county level disaggregation of acreage, yield, and costs per acre for major traditional crops and energy crops makes POLYSYS an ideal model to feed agricultural results to environmental and economic impact models. The distinctive analytical capabilities developed by APAC, in close collaboration with other faculty and staff in the department, make it possible to provide DOE and USDA with data and analyses of bioenergy feedstock production that are otherwise unavailable. Because of subsequent integration into the National Energy Modeling System of USDA's Energy Information Administration, the estimates for the agricultural and biomass sectors in the Annual Energy Outlook are from POLYSYS.

Additional details on the major analytical capabilities incorporated into POLYSYS (either directly or with the use of parameters derived from deterministic and stochastic runs of other models) include:

- Integration of cropland, cropland in pasture, pastureland/rangeland, and cropland in the Conservation Reserve Program into POLYSYS as single analytical framework

- In addition to the capability to evaluate the competitiveness of bioenergy dedicated crops (such as switchgrass, poplars, willows, and forest sorghum), the competitiveness of other feedstocks such as crop, forest and wood residues can be evaluated by POLYSYS by the different land-use categories listed in previous bullet.

- Endogenous integration of land-use changes and changes in agricultural production practices with changes in embodied energy, soil carbon, and net carbon flux.

- Endogenous capability to assess environmental performance of the agriculture sector including erosion and concentration and leaching of nitrogen and pesticides under a wide array of possible conditions.

- The stochastic capability was reactivated to incorporate the 305 agricultural supply regions and other added capabilities. Auxiliary programs were written to table, display and summarize the mammoth volume of data generated by the various versions of the model.

Data Manager: Data Retrieval and Display

Data Manager is a second important research tool that APAC uses on a daily basis. Data Manager is a self-contained Windows-based computer program that was designed, programmed, and continues to be maintained, by the Agricultural Policy Analysis Center. The Visual Basic program allows users to access, assemble, and graph agricultural supply and demand data for any combination of countries, commodities and variables. For example, with a few clicks 1960 to 2013 data for wheat used for food in Sudan can be graphed almost instantaneously along with corn used for feed in Ethiopia. Data and graphs can be saved as a text file or copied and pasted into a spreadsheet or word processing program. Data Manager users access variables via a hierarchical tree structure that is similar to the cascading levels of folders, subfolders, and files generated by "list directory" commands of computer operating systems.

The USDA's PS&D (production, supply and demand) database is one source of the data. Reformatted PS&D data are combined with metadata, or "data about the data," and stored on a University of Tennessee server. The PS&D database is updated each month when the USDA releases the World Agricultural Supply and Demand Estimates (WASDE), usually near the 10th of the month. After each monthly update, a fresh copy of the PS&D database is downloaded and prepared for use by the Data Manager program.

TNFARMS

TnFARMS is the name of a set of representative farm models that used the methodology developed by James Richardson and his cohorts at Texas A&M University. For each representative farm model, it involves selecting a group of three or four farmers who operate farms similar to the type of representative farm to be modeled. The group of farmers meets with the researcher for three or four hours in a casual setting. The researchers ask questions about the make-up of a farm that the group thinks would be representative of the area and the crops being considered. The questions cover all aspects of the farm from size, mix of crop acres, inputs required and their prices, crop yields, and so on. The researchers take this information back to the university and prepare the data for use by the Firm Level Income and Policy Simulator or FLIPSIM that was developed at Texas A&M. Once the farm is set up, it is ready to be used to evaluate the impact of alternative economic conditions and policies. The farm panel data needs to be updated regularly (every two to three years) to ensure that results remain relevant. In Tennessee representative farms were constructed for a large and medium-size cotton farms, a large and medium-size grain farms and four tobacco farms.

Research Areas

The unit's major research thrusts are summarized in this section. While all APAC staff and faculty tend to be involved one way or another in each research area, the summaries identify the primary researchers from APAC, the department, University of Tennessee Institute of Agriculture (UTIA) and from other institutions including Oak Ridge National Laboratory (ORNL).

BioEnergy Related

The bioenergy area has been a primary source of grant funding for the Agricultural Policy Analysis Center and the Department of Agricultural and Resource Economics. This has been a fruitful area to pursue funding because of a relatively long history of departmental interest and research in switchgrass and bioenergy, the existence of an analytical model adaptable for use in simulating bioenergy scenarios, and the collection of expertise and skills of collaborating faculty and staff in the Department of Agricultural Economics and Resource Economics and APAC.

What follows in this section is a collection of research projects/outcomes that is representative of the type of research carried out by the bioenergy researchers. Researchers include: APAC—Daniel De La Torre Ugarte, Kelly Tiller, Chad Hellwinckel, Brad Wilson, Steve Slinsky, Lixia Lambert; Department—Burt English, Kim Jensen, Christopher Clark, Dayton Lambert, Edward Yu, James Larsen, Lixia He Lambert, Michael Wilcox, and Jamie Menard; UTIA—Don Hodges, Samuel Jackson, Timothy Rials and Thomas Klindt; ORNL—Marie Walsh and Richard Nelson; USDA—Hosein Shapouri; Forest Service—Peter Ince; and European Forest Institute, Finland—Alexander Moiseyev among others.

Improve information on the economic potential and impacts of cellulosic biofuels: This research has been instrumental in providing critical information to the USDA/DOE for use in assessing the potential supply of bioenergy feedstock production in the United States. The ongoing research began as part of the One Billion Ton Study and continues to provide research results to the Department of Energy's Energy Information Administration for use in the annual Energy Outlook in the area of renewable transportation fuels.

Estimation of environmental impacts of extended biofuels production: This research evaluated the U.S. impacts of increased ethanol production from corn and/or dedicated bioenergy crops on agricultural land use, production and prices of major crops, farm income, and the environment. Research results identified important turning points. For example, levels of ethanol production from corn or dedicated bioenergy crops that trigger large acreages of pasture land or Conservation Reserve Program land to be brought into production. Depending on the trajectory of ethanol needs being simulated, large changes in land use were indicated. In the case of corn, early work provided detailed information on where and at what levels corn acreage would expand as mandated ethanol levels became effective. Realized expansion of corn acreage, including in areas where corn typically was not grown, broadly matched a priori POLYSYS-based estimates.

In the case of corn in particular, but also with the conversion of pasture land to the growing of dedicated bioenergy crops, regional tillage intensity went up, soil erosion rose, fossil fuel-based carbon emissions increased, and soil carbon stocks decreased assuming traditional use-patterns of conservation practices. It was also shown that additional adoption of conservation tillage practices could mitigate adverse effects on soil erosion and net carbon emissions into the atmosphere.

Estimation of the economic wide impacts of Renewable Energy Standards: This research evaluated the impact of meeting the Federal Renewable Electricity Standards (RES) on the agricultural production sector. Renewable energy technologies were assessed to determine their ability to contribute to meeting the additional renewable energy requirements given the resource base of four states Colorado, Florida, Kansas, and North Carolina. The expenditures on construction of additional renewable energy facilities and recurring operating expenditures on inputs to renewable energy generation were then used to project the economic impacts of meeting the additional renewable energy requirements.

Identification of ideal locations for biorefineries and preprocessing facilities to service biomass supplies: BioFLAME is a comprehensive GIS modeling system for assessing potential feedstock across a region and identifying ideal locations for biorefineries and preprocessing facilities. It is designed to locate these facilities in a way that minimizes feedstock procurement and transportation costs while satisfying industrial requirements. Remote sensing data is incorporated to analyze feedstock availability at the sub-county level while street level network analysis estimates transportation costs of hauled cellulosic material from field to facility. A flexible suitability analysis allows for sites to be situated near or away from a variety of geographic features that may be important to a particular scenario. The BioFLAME model has been used in a number of the bioenergy related projects.

Estimation of woody biomass potential for energy feedstock: The production reliability and relatively low costs of sustainably harvested woody biomass such as logging residue and low value roundwood could make it a significant component of the Renewable Fuel Standard portfolio. This project determines the least-cost woody biomass harvesting combinations of different sources and wood. Findings suggest that collecting forest residue and non-merchantable (small sized) timber may provide the largest initial contribution in woody biomass supply. Within a reasonable range of harvesting costs, demand for roundwood is expected to increase with higher energy production targets. Harvesting merchantable natural softwood as woody biomass has relatively small impact on marginal supply costs. This would result in little or no disturbance to merchantable natural softwood timber management and operations if demand for woody biomass increased

Climate Change and Carbon Sequestration

This series of projects analyzed how meeting several proposed energy/climate-change/carbon sequestration instruments might impact the U.S. agricultural sector. Along with the RFS, policy scenarios that have been analyzed include a cap-and-trade regulatory system and varying treatments of agricultural offsets. The results indicate that under a properly constructed cap and trade program: net returns to agriculture are projected to be positive and exceed baseline projections for eight of nine crops analyzed; income from offsets and from market revenues is higher than any potential increase in input cost including energy and fertilizer; at projected carbon prices of up to $27 per MtCO2e, afforestation of cropland will not occur; major shifts in commodity cropland use do not occur; crop and beef prices are not disrupted; and biomass feedstock production creates significant direct and indirect reduction in greenhouse gases (GHG). This includes a direct reduction of an accumulated 460 million metric tons CO2 equivalent. A project with NASA also expanded the capabilities of POLYSYS to estimate and track changes in soil carbon levels and net emissions from agriculture. Output from the model supported the North American Carbon Program.

Researchers include: APAC—Chad Hellwinckel, Daniel de la Torre Ugarte and Brad Wilson; Department—Burt English, Kim Jensen, Christopher Clark, Jamie Menard, Dayton Lambert, Edward Yu and James Larsen; ORNL—Laurence Eaton, Mark Downing, Virginia Dale, Keith Kline, Craig Brandt, R. G. Nelson, Gregg Marland and Robert Perlack; Consultant—Tris West among others.

Local Food Systems

The area of Local Food Systems has become an increasingly important component of the U.S. food production and marketing systems. Many other areas of the country are further along in the development of local food systems. APAC's Chad Hellwinckel is particularly interested in this area. His research to this point has focused on identifying existing and emerging local food system practices in the U.S. and around the world and assessing the current status of local food systems in Knoxville. The Knoxville focused study, entitled "A Local Food System Assessment of the Knoxville Foodshed," was recently published by the City of Knoxville. Other research is planned and discussed in a later section of this report. Chad is serving as vice president of the mayoral appointed Knoxville Food Policy Council. Within the Food Policy Council, Chad has helped organize public input meetings, resulting in the council's publication "Spring 2013: Community Research Findings and Recommendations." Chad has also been contacted by national organizations to speak on the subject of the importance of local food systems, including the 'Healthy Farms, Healthy People Coalition', and the American Farmland Trust. Primary Researcher is: APAC—Chad Hellwinckel.

Tobacco Policy

Historically tobacco has been an important crop in Tennessee, especially East Tennessee. When it became evident that Congress was moving toward buying out farmers' licenses to grow tobacco in which supply was tightly controlled and prices were guaranteed, APAC used the TnFARMS set of four tobacco representative farms to simulate the farm-level

impacts of a tobacco quota buyout and transition legislation. Results suggested that the buyout would increase net farm income during the buyout period but only the two larger representative farms would likely find it profitable to continue to produce tobacco. In addition to the farm-level simulations, IMPLAN studies were conducted to estimate the regional and state-wide impacts of the buyout on economic activity and employment on the major tobacco states. Cumulative economic impact for the six major tobacco states over the period of the buyout was estimated to in the billions of dollars; $18 billion for the buyout specifications that appeared in the enacted legislation.

Within a few short years, APAC's Kelly Tiller became one of three premier tobacco policy analysts in the Land Grant University System. APAC research contributed directly to the understanding and development of the buyout issue. Data and analyses were provided to several government agencies. The official numbers that the Congressional Budget Office used to "score" the cost of the buyout came directly from APAC research. Tiller directed and carried out this research with the help of Jenifer Brown and APAC colleagues.

The acquired experience and reputation in the tobacco policy area provided the credibility and opportunity to work closely with various tobacco and farm groups and industry stakeholders during the buyout transition period. Since the collection of tobacco information ended with the buyout, Tiller and colleagues developed and implemented a comprehensive tobacco survey that generated a wealth of information from over 6000 participants. The Center for Tobacco Grower Research grew out of the recognition that such surveys were necessary to ensure a viable and efficient industry. This center was part of APAC until 2014 when it separated from the university. Primary researchers were: APAC—Kelly Tiller, Daniel Green, Jane Starnes, Shiferaw Feleke, Harwood Schaffer, Daryll Ray, Daniel Da La Torre Ugarte, Mahadev Bhat, Duncan Chembezi; Department—Burt English and Jamie Menard; Other Institutions—William Snell from University of Kentucky, Blake Brown from North Carolina State University and Dixie Reeves and J. Michael Moore from Virginia Polytechnic State University.

Cotton Policy Analysis

Cotton has long been an important crop in Tennessee as well as in other southern states. The TNFARM modification of FLIPSIM was used with data for a number of types of Tennessee farms. Grants from Cotton Inc. provided funding to do additional policy analyses for cotton representative farms in Tennessee and also for representative farms in Alabama, Georgia and North Carolina. The five representative farms were used to evaluate policy options, price scenarios, marketing decisions or other economic conditions as they became issues of interest. Impacts of each scenario were estimated on the farms' cash flow, net income, long-term survivability and financial strength. This work and other TNFARM analyses were carried out from 2001 to 2007. Unfortunately, expertise and resource restraints prevented continuation of this work. The intent was to resume this work but the combination of expertise and funding never materialized. The principal researchers were: APAC—Kelly Tiller, Jennifer Brown, Brad Wilson, Steve Slinsky; Department—James Larson.

General Macro Agricultural Policy Analysis

As mentioned in the introduction, part of the motivation for initiating the Blasingame Chair was to fill a perceived departmental void in the area of commodity/agricultural policy. Providing analyses of Farm Bills—both alternative possibilities and enacted farm legislation—were mentioned and have been an important part of the work of the Blasingame Chair Team/Agricultural Policy Analysis Center. APAC focuses much of its attention on how policy changes—but also changes in economic conditions, consumer preferences, and international circumstances—impact production agriculture and the farmers and ranchers that make production happen.

The focus on agricultural producers is intentional. Agricultural policies affect many groups of people, including multinational agribusinesses. These and other well-positioned stakeholder groups have the incentive and resources to affect policy discussions in ways that positively affect them, but may not always have the same benefit to producers (or consumers and taxpayers).

For example, agricultural producers naturally prefer maximization of their net income while agribusinesses prefer policies that maximize bushels or tons of agricultural output (and hence their sales of inputs and marketing services). Even the policy interests of agricultural producers and commodity/farm organizations do not always perfectly overlap. Also, producers and their proponents sometimes need—but often don't appreciate—reality checks (examples: consumer sovereignty, transparency, EPA regulations, antibiotic use). In order to acknowledge and deal with "elephant-in-room" issues, analytical independence is critically important. Independent analysis is not necessarily value-free, but it is absent of external interferences and motivations. APAC is fortunate to be in an institutional setting that has been unwaveringly supportive of the unit's analytical independence.

Analyses related to farm bills and commodity programs are predictably more intense in the year or two before and the current year of the passage of a new farm bill. Upon arrival, work began immediately to prepare the use of POLYSYS to analyze farm bill proposals that were put forth to replace the 1990 farm bill. Prior to the passage of the 1996 Farm Bill, APAC developed eight newsletters, each evaluating a farm bill proposal being actively considered by Congress or stakeholders. During each subsequent Farm Bill cycle, a POLYSYS based set of analyses has been completed and made available to policymakers, producers and other stakeholders. Major studies were completed between farm bill debates comparing, for example, the cost of using grain reserves and other traditional commodity program instruments in place of the programs in use at the time, which predominately relied on government payments to boost farm incomes above what was available from the market. For a number of years the Economic Research Service used POLYSYS to evaluate alternative commodity program configurations.

Results from POLYSYS simulations give us the luxury of concrete numbers on which to base analyses of alternative farm program configurations. But from its beginning, the unit has been expected to be in position to and be available to respond to a diverse set of agricultural issues, most of which can't be evaluated by POLYSYS. Empirical results from other researchers are sometimes available, sometimes not. Often what is needed is an easy-

to-understand break-down of a legislative proposal or of the "rules and regs" that an administrative agency plans to use to implement a law. Often, media stories are too brief and disjointed to adequately convey such information. Because of what is said or not said in media reports, producers and others occasionally extrapolate the impact of a regulation, for example, well beyond what the rules and regs actually say and allow.

Court decisions are another reoccurring example of the need for this type of research and outreach. As with legislation and rules and regs, it takes considerable time to wade through the legalese to distill and accurately communicate an understandable rundown of court decisions. Here again, in addition to presenting understandable renditions, we provide independent analysis of the impact of the rulings on producers and other stakeholders. To be of most-use, this type of research and outreach has to be made available quickly. While other units do some of this type of timely research and outreach, APAC specializes in filling what we see as an information and analysis void.

Agricultural and food issues come up continually; often they are contentious and are foreboding, if not threatening, to producers—causing them and their proponents to take short-run expedient positions or make responses that may be detrimental in the longer-run. There are numerous examples of this that we have addressed over the years, some of which have been alluded to earlier.

It is important to address these issues when they arise. Many of the "misunderstandings," at least what seem to be misunderstandings to us, are caused by losing sight of the market economy's reason for existence—that is, to produce goods and services that consumers need and want. Producers have of course been doing that for centuries. But once food is plentiful and incomes are adequate, consumers become interested in the specifics of food production such as what exactly is involved in its production and processing and where was it done. But the mantra that has worked so well for so long for production agriculture is "Produce it and they will come." Farmers eagerly adopt cost-saving and production-increasing technologies not only as means to be profitable and survive but also because those producer-chosen technologies provide ample quantities of food at reasonable prices to consumers. Commercial farmers tend to bristle when consumers question the technologies that they use.

Our role, as we see it, is to remind producers that consumers are really in charge and they eventually get their way. We tend not be so blunt as to come right out and say that it really does not matter what producers think of the justification or lack of justification that is behind consumers' positions on agricultural and food issues, but that is the message we try to convey. In some cases, as much as anything, the problem is perception. In the case of the use of antibiotics in livestock production, it is likely a losing battle to hide behind the term "judicious use" when that includes supplying antibiotics to healthy livestock in order to increase their rate of growth or for prophylactic use. No defense of such uses is going to be convincing to a mom and dad concerned about antibiotic resistance. It will only amplify distrust of the industry.

There are numerous other examples of consumers questioning agricultural production practices that we have tried to put into perspective for farm operators. Transparency and

animal welfare issues are among agriculture's greatest public relations challenges at the moment. We feel that none of these and other consumer-driven issues will be going away anytime soon. If that is true, agriculture really has no choice but to take issues like these seriously. In the case of transparency and animal rights issues, passing state "ag gag" laws may play well among livestock producers but in all likelihood hastens the long-term reduction in domestic per capita consumption of beef and pork.

Often farmers and their proponents blame special interest groups as "the" source of problems. Clearly, special interest groups have often been effective, but in the case of animal welfare issues, for example, independent public surveys suggest that respondents, who were unaware of special interest group positions on the issue, care deeply about animal welfare. In other words, it makes no difference how consumers arrive at where they are on an issue, they rule. It is natural to think that consumers would think differently if only they understood the issue from producers' perspective. That may be true in some cases, but probably not in most cases. Even though it may seem trivial compared the emotionally-driven issues of today, recall that despite Henry Ford's early proclamation that he would only produce black cars, it hasn't worked out that way.

The point is that this is another area—long-term vs. short-term consideration of contentious issues—where APAC provides important analyses to producers and stakeholders that are generally unavailable elsewhere. While we focus most of our attention on farmers and production agriculture, we also research and add value to discussions related to food safety, climate-change and its potential impact on farmers and agricultural production, hunger in the US and abroad, food security, the long-range potential for agricultural production among small-holders around the world, crops not grown in the US that have the potential to help reduce hunger world-wide, the role exports have played in US agriculture, and changes in the US agricultural sector. The weekly column and presentations are important outlets for conveying research information on these and other diverse issues.

Finally we think it is critically important to routinely consider how the unique nature of food and agriculture can affect economic analyses of the agriculture and food sectors. The magic of the market is awe inspiring to us economists, as it deserves to be. It provides a built-in way to recalibrate a sector's performance whenever the need arises. If prices fall to unsustainable levels, for whatever reason, two things happen: consumers respond by increasing the quantity demanded and thus reduce excessive levels of product inventory and secondly, producers immediately reduce the production of the industry's product. Recalibration tends to be quick and complete.

But in important ways, "food" is not like other goods. In contrast to non-food items, food consumers do not have the option of substantially delaying or declining to purchase food; demand theory's implicit non-coercive assumption is not valid for food. When economists portray demand curves in economics textbooks or in the classroom on whiteboards, the demand curve is often/usually drawn with a relatively flat slope and the curve typically intersects the vertical axis, suggesting that, if prices get high enough, the quantity demanded will approach a very low level, probably zero.

Since it is needed to sustain life, food must be secured no matter how high the price, and yet a much-reduced price does not result, for example, in a movement to eat 5 meals per day. Thus, the quantity demanded of all food/feed taken together varies relatively little with changes in price causing the demand curve to have a very steep slope (this deserves a bunch of caveats relating to categories of demand and so on that economists can readily recite but they do not materially dilute the argument as it relates to the nature of aggregate demand). This of course means that there is limited opportunity for the market to self-correct from the demand side.

The textbook depiction of relatively flat-sloped supply curves do not fit agriculture well either, especially the aggregate major-crop supply curve. As in the case of the quantity demanded, aggregate quantity supplied responds sluggishly to changes in prices, especially price declines. In the case of grains, there is no market leader that is large enough to influence supply nor do grain farmers typically produce to fill customer orders like John Deere and other manufacturing plants commonly do. Once land is brought into crop production, it tends to produce output under the direction of the current operator or his/her replacement long after entrepreneurs in other industries would have idled production. Farmers will change their crop mix but they produce something.

This lack of timely self-correction from both the demand and supply side is not a problem if supply and demand grow at roughly the same rates. It can be a problem if crop yields grow materially faster than demand, but the most severe multiyear problems follow a series of exceptionally high major-crop prices.

During the last hundred years there have been four major multiyear run-ups in major crop prices: 1) during and immediately after World War I, 2) during and immediately after World War II, 3) during the 1970s following a change in the Soviet Union's policy to import grain rather kill off animals when grain production was short, 4) the mid 2000s due to state and federal mandates to produce grain-based alcohol for motor fuel. Note that all these multiyear price run-ups were demand driven and had political roots.

During each of these periods a number of things happen. Prices go so high and stay high for so long that farmers in the U.S. and around the world respond by converting non-cropland areas into cropland. Governments, agribusinesses and farmers mount mammoth investments in yield-increasing technologies.

Next, after a few years, the increased production from the larger acreages and higher yields hit the market with a vengeance, sending plummeting prices to levels unimaginable a just few years earlier. Then, given its limited ability to self-correct, crop agriculture falls into a period of chronically low prices and incomes, moderated only to the extent available under farm legislation. After many years of low prices, some resources go out of agriculture. By the time another exceptionally strong demand shock (it could be a strong extended supply shock as well) drives the price to unimaginable levels, a new generations of farmers ride the beginning of new cycle.

In addition to the temptation to think "it will be different this time—that is, conditions are finally such that prices will be high from here on out"— beginning in the mid-1980s

arguments were put forth implying that the differences between ag and other sectors mentioned above no longer exist. Many of the statements they make are indisputable like: the declining percentage of the population engaged in production agriculture, the closing of the gap between incomes of farm and non-farm households, and the increasing share of farmers' production inputs are purchased, all of which have indeed occurred since the depths of the depression in the 1930s.

But of course none of these statements deal with the ability of agriculture to self-correct. Even though there is no compelling evidence that either demand or supply is now sufficiently elastic to facilitate timely self-correction when it is needed the most (when prices are well below the cost of production), most farmers, their proponents, and policy makers seem convinced that from here on major-crop agriculture will do just fine, thank you very much—just give us some insurance help to deal with those annoying year-to-year yield fluctuations around trend and those minor fluctuations around the new, much higher than ever before, price threshold. We are not so sure.

A significant share of APAC's effort and outreach deals with the ability of agriculture to self-adjust, the historical context and their implications. We feel this discussion is needed and few if any others are talking about these concepts and concerns with farmers and other agricultural stakeholders.

Researchers include: APAC—Daryll Ray, Harwood Schaffer, Chad Hellwinckel, Daniel de le Torre Ugarte, Kelly Tiller, Brad Wilson, and earlier Mozhgan Shahidi, Steve Slinsky; Department—Burt English and Jamie Menard; Other Institutions—Mike Dicks from Oklahoma State University, Paul Westhoff, William Lin, Bob Skinner and Scott Sanford.

Communication with Clientele

From the outset it was clear that the dissemination of research results from the Blasingame Chair Program requires paying attention to a much broader set of audiences than is typical of the standard faculty position. Many of the expected target groups were specifically mentioned in the position announcement and the planning document. From the position announcement: "…demonstrated ability to conduct research and to convey the results and their implications to decision-makers, industry and other parties of interest." From the planning document "…encouraged to deliver his/her findings to the public, state institutions, agricultural interest groups, and to farmers."

The first (Table 3) of the four tables in this section focuses on the number of venues in which research results and their implications were conveyed to policy decision makers. The second table (Table 4) lists the numbers of presentations by the various audiences—farmers, industry groups, agricultural interest groups and other parties of interest. The third table (Table 5) lists the numbers of publications by categories of research publications, staff papers, popular press items, APAC columns and other reports, some of which are aimed directly to farmers and agricultural interest groups and some are more academic in nature. The fourth table (Table 6) lists publications and presentations that are of primarily of interest to academic audiences and discipline peers.

Table 3 lists the number of invited testimonies, committee prints, proceedings and presentations to decision makers, whether that be Congressional Committees, Legislative Committees, Governors, national and state executive/administrative agency heads or their staffs. Also, included in the table are international presentations to foreign-country legislative or executive officials and international multi-government sponsored organizations as well as the USDA and southern region agricultural outlook conferences. Since its creation, the Chair Program has been invited to testify before a Congressional Agriculture Committee prior to the passage of each farm bill. Testimony has been provided for national commissions on Payment Limitations, Tobacco, and 21st Century Production Agriculture.

Table 3. Publications and Presentations to Legislative and Regulatory Decision Makers: National, International, State, 1991-2014

Description	Total
National	
Testimony Before U.S. Congressional Committees and National Commissions	15
Congressional Staff Briefing Presentations	42
Staff Briefing Presentations, Congressional, Legislative and Executive Agencies	106
USDA Agricultural Outlook Forums	4
International	
Testimony before International Legislative Groups	13
International Organizations, WTO, UNCTAD, etc.	21
State and Regional	
Legislative and Agency Presentations	26
Reports to the Governor	23
Southern Region Agricultural Outlook Conferences	6

Table 4 includes presentations to both domestic and international audiences. The domestic section includes farmer-member based groups including general farm organizations and commodity organizations and attendees of farm policy conferences and other meetings. These state-level, regional and national presentations have provided hundreds of invited opportunities to interact with producers on a broad spectrum of issues. Overall, over 400 domestic presentations have been made to farmers and others interested in agricultural policy issues.

Table 4. Presentations: International, Domestic, 1991-2014

Description		Total
International:		
	Presentations to Farm Groups	10
	Academic Seminars and Professional Groups	54
	Presentations to NGO's and Other Organizations	21
Domestic:		
	Farm Policy/Business Conference Presentations	46
	Farm Organization Presentations	60
	Commodity Organization Presentations	26
	Non-Government Organization (NGO) Presentations	41
	Professional/Industry/Community Group Presentations	95
	Cooperative Extension Service Education Programs	45
	Experiment Station Educational Programs and Technical Training	36
	Press Conferences	9
	Community and Service Organization Presentations	45

The international section of Table 4 includes invited presentations to farmer groups but also invited presentations to academic and professional groups as well as presentations to

NGO's and other organizations. As is the case for the out-of-state domestic presentations, the inviting group pays travel expenses.

Table 5 lists the number of published items for a rather wide variety of publication types. The Bulletins, Reports, Pamphlets, Fact Sheets, and Staff Papers categories are aimed primarily to academic audiences, except for the Pamphlets and Fact Sheets, which are written for a more general audience including farmers. Research Reports to Sponsors are as self-evident as they are necessary to produce. The remaining two categories include writings in Popular Press and Periodical and our weekly column *Policy Pennings*.

Table 5. General Research Publications and Reports, 1991-2014

Description	Total
Bulletins, Reports, Pamphlets and Fact Sheets	39
Departmental and Agricultural Policy Analysis Center Staff Papers	38
Policy Pennings	731
Popular Press, Trade Magazines, and Periodicals	32
Research Reports to Sponsors	73

We began writing the column in July 2000 for the *Mid-America Farmer/Grower*. In addition the column is available on APAC's website, www.agpolicy.org. The column is widely distributed via a listserve of about 1,000 email addresses. Some of these recipients then forward our column to their own listservs. In the intervening years, the column has been picked up by weekly agricultural publications in other sections of the country. Today the column is carried on a weekly basis by agricultural publications with a combined paid circulation of 300,000. In addition, individual columns are picked up and used by other farm publications and organizational newsletters. The annual total number of unique downloads from the website of individual columns is 500,000 by people from over 50 countries.

Policy Pennings has enabled us to address the hottest agricultural issues of day with readers from all the category lists of agricultural interests, including legislative and regulatory decision makers, farmers, farmer-based organizations, NGOs, and peers, and the column allows us do so on a weekly basis. The column is our most important vehicle for extending policy research and information to agricultural stakeholders and others interested in agriculture. It also generates most of the opportunities for presentations before audience groups.

Table 6 lists numbers of publications and presentations that have an academic focus. Though not stated as its central mission, the Blasingame Chair Program needs to publish academically since it is part of an academic department. The movement of research associates to tenure track positions and research assistant professors underscored the importance of traditional academic publications and presentations for purposes of tenure and promotion. Since the beginning of the Blasingame Chair Program unit, 59 referred articles have been published in professional journals, 162 presentations have been made before professional meetings or conferences, 21 book chapters have been produced as well as other contributions to academic outlets.

Table 6. Academic Publications and Presentations, 1991-2014

Description	Total
Referred Articles in Professional Journals	59
Published Abstracts and Papers presented at Professional Meetings or Conferences	162
Book Chapters	21
Contributions to Edited Volumes	18
Academic Seminars and Presentations	67
Special Lectures/Honor Presentations	5

Teaching

Table 7 lists the courses taught by APAC faculty including graduate courses AREC 530 Agricultural Policy Analysis and AGEC/AREC 593 Globalization and Agricultural Policy Issues, and undergraduate courses AREC 430 Food and Agricultural Policy and AREC 420 International Agricultural Trade. Daryll Ray, Kelly Tiller and Daniel de la Torre Ugarte taught the courses. Each course was for 3 credit hours with 489 students enrolled over the 1991 to 2014 period. The graduate policy course is the only course currently taught by APAC faculty (Ray). Each of the three tenure track faculty plus Harwood Schaffer and Chad Hellwinckel have been guest lecturers in a total of ten courses (Table 7).

Table 7. APAC Faculty and Staff Courses Taught and Guest Lectures, 1991-2014

Dept. Name	Course Number	Course Name	Credit Hours	Years Taught	Total Number of Students
Courses Taught					
AGEC/AREC	420	Agricultural International Trade and Marketing	3	5	60
AGEC/AREC	430	Agricultural Policy	3	10	173
AGEC/AREC	525	Agribusiness Operations Research Methods	3	4	56
AGEC/AREC	530	Agricultural Policy Analysis	3	20	200
AGEC/AREC	593	Globalization and Agricultural Policy Issues	3	2	8
Courses Guest Lectured					
AG-CASNR	101	Perspectives in Agriculture	3	10	
AGEC/AREC	201	Economics of the Global Food and Fiber System	3	1	
CASNR	317	Agriculture and Natural Resources Honors Seminar	3	3	
ANR	330	Agricultural Biotechnology	3	3	
ANR	333	Food Forests and the Environment	3	2	
AGEC/AREC	430	Agricultural Policy	3	6	
AGEC/AREC	470	Natural Resource Economics	3	4	
AGEC/AREC	530	Agricultural Policy Analysis	3	6	
AFST	421	Comp St: Afr.Amer Society	3	2	
AFST	480	Afr-American Comm/Urban Amer	3	1	

Table 8 lists the number of masters and PhD students for which APAC faculty served as major advisor or a committee member. Most students received degrees in our department but students also received degrees in Economics, Geography, Sociology, and Forestry. See Supplemental Materials for Table 7 and Table 8 for additional detail on courses taught and graduate students advised.

Table 8. APAC Graduate Student Advising, 1991-2014

Degree	Number of Students	Number of Students Served as Major Professor	Number of Students Served as Committee Member
PhD	5	1	4
MS - Thesis	25	16	16
MS - Non-Thesis	3	3	

Current research areas

In addition to the ongoing research to address current issues of the day, the following areas are currently being researched.

Biofuels

Ongoing projects with the Department of Energy and the Department of Agriculture to use POLYSYS to estimate quantities of feedstocks, prices of feedstocks, impacts upon other commodity prices, and land use change as a result of biofuel policy scenarios. APAC researchers are working with Oak Ridge National Laboratory to use POLYSYS to update its third iteration of the 'billion ton' report, which estimates supply curves of various feedstocks. We are also working with the USDA Office of Energy Policy and New Uses to help them use POLYSYS to estimate impacts of various alternative scenarios on feedstock supply, such as very high future energy prices. Chad Hellwinckel is the primary researcher with collaboration from Daniel De La Torre Ugarte via subcontracting and Burt English

Research continues on the potential of wood biomass as a feedstock. Current work emphasizes the woody biomass potential in the South and Southeast. The Southern Woody Biomass Supply Model is being developed to determine which regions in the South have comparative advantage in supplying woody biomass without disrupting conventional wood demand. The IMPLAN model will be used to estimate the economic impacts of the woody biomass harvesting in the Southern U.S. Initial results suggest that woody biomass supply, composed of forest residues and non-merchantable timber, can be secured at reasonable prices and would positively impact local economies. Burt English and Lixia Lambert are the primary researchers with collaboration with Daniel De La Torre Ugarte and others.

Continuing work on BioFLAME includes development of a woody feedstock component and evaluation of the feasibility of large-scale placement of biorefineries and preprocessing facilities across the southeast. Work is beginning on using BioFLAME as part of investigating the use of oilseed-based feedstocks and forest residues as alternative sources of jet fuel. Primary researchers include Brad Wilson, Burt English, Dayton Lambert, Edward Yu and Tim Rials.

Land Use Changes

EPA contract to investigate the impact of biofuel mandates on Conservation Reserve Program enrollment and conversion. The research uses an expanded version of POLYSYS that allows CRP conversions to a wider set of biomass production activities. Chad Hellwinckel is the primary researcher on this project.

Local food systems

Researching and comparing the transportation energy efficiency of local food to conventionally sourced foods. This research entails surveying farmers providing food for Knoxville's market on their transportation distance and fuel use, and comparing the per unit transportation efficiency with conventionally sourced foods. The intention of this effort is to project local food costs and conventional food costs under scenarios of increasing energy costs, and compare which model could gain a competitive advantage. Local food may have inefficiencies that could be improved by planning. Chad Hellwinckel and a graduate student are the primary researchers for this project. Chad and the City of Knoxville have applied for funding to initiate a feasibility study of a food hub serving the Knoxville foodshed.

International development

Conducting some exploratory international agricultural development work in Guédé Chantier, Senegal in which the goal is to engender positive change in areas that have been identified by the local community. One aspect of the strategy is to engage individuals and their local religious, cultural, and political systems in the process of identifying community problems, needs, and goals and then responding to the self-identified needs of the community working in the form of citizen/farmer-directed activity and research. The other aspect of this work in international development recognizes the connection between good governance and positive economic and community development and then examines pre-colonial, indigenous democratic traditions in sub-Saharan Africa as potential models for implementing democratic governance based on African traditions. Harwood Schaffer is the primary researcher for this project.

On-going policy analysis

Much of this work on US agricultural policy revolves around farm bills that are adopted roughly every five years. During the life of a farm bill, research examines the implementation of the farm legislation by the US Department of Agriculture and the extent to which it meets the needs of farmers and consumers. As the political and economic climate changes, each farm bill becomes prelude to the discussion for the next farm bill. During the debate periods for each farm bill, POLYSYS analyses of alternative policy proposals are run to identify the range of potential costs over the tenure of the bill. Analyses of the activities of the Environmental Protection Agency, the Food and Drug Administration, and the National Institutes of Health (among other agencies), as well as major court rulings are also ongoing areas of research. Harwood Schaffer, Daryll Ray, Brad Wilson and Chad Hellwinckel are the primary researchers.

Mission, Objectives, Activities of Blasingame Chair Program in the Future

Of course, the short version of this section is: it depends. It depends largely on the interests and abilities of the person who is selected to fill the chair position when the current chair retires at the beginning of 2015. But not unexpectedly we suspect, we do have thoughts (dare we say preferences) about the future direction and activities of the Blasingame Chair Program. One way to view these thoughts is that they arise from the perspective of who we are and what we would do with the continuance of the current chair program.

First and foremost, we very much believe that the objectives and expectations of the chair program as presented at the front of this document should guide future Blasingame Chairs of Excellence in Agricultural Policy. Without repeating what's in the early section of the report, let's just say that we believe to be of the most benefit: the chair should be an independent analyst, willing to question the conventional wisdom of day.

We also believe that chair's primary clientele for the dissemination of research results and policy analyses are those who make agricultural policy decisions and those who are the most affected by those decisions. Agribusinesses and other groups focus on policy and policy impacts that most benefit them, which does not always takes into full consideration the (especially longer-term) interests of agricultural producers, food consumers, and civil society in total. The chair should be in a position to discuss the broader considerations that he/she believes should be part of a policy's analysis without fear of reprisal.

After that it gets to be more philosophical. As is described earlier in the report, we believe that aggregate agriculture supply and total food demand have unique characteristics that prevent the kind of quick market adjustment that is taken for granted in economics textbooks. This extreme price inelasticity of supply and demand is not a new take on these markets. For decades it was the accepted characterization. Over time, however, due perhaps to recent agricultural supply and demand experiences, the inherent attractiveness of free markets and agriculture's decreased share of GDP and employment, the dominant view is as if major-crop agricultural supply and demand have become considerably more price elastic. As long as there is balanced supply and demand growth, or demand grows faster than supply, no problem: policy only needs to take care of variation around a flat or increasing trend for prices and incomes.

We see no evidence or logic to suggest that major-crop supply and demand have come to look like the positive and negative 45 degree supply and demand curves drawn in economics textbooks and classrooms. We may be about to experience the full force of extremely price-inelastic supply and demand curves, just as was experienced after the extended crop price run-ups associated with the two world wars and the 1970s.

Agricultural interests need to be presented with counterviews to "it's different this time." But apart from what may happen during the current span of time, agricultural interests need to be informed about the nature of aggregate agricultural and food markets. This discussion has been part and parcel of the Agricultural Policy Analysis Center. Of course, the Agricultural Policy Analysis Center name need not go forward with future Blasingame Chair Programs. Yet, we feel there is a void with regard to this market structure issue.

The arrival of David Hughes, the new Greever Chair in Agribusiness Development, provides a major opportunity to work toward developing additional Tennessee investments in agriculture and agribusinesses. The Blasingame Chair Program could participate in this effort by providing background research that the Greever Chair needs to carry out a successful development program.

In terms of grant and contract research, we feel that the heyday for money to do biomass related research may have passed. However, we are in position to take advantage of grant and contract monies that are still available in that area. Future bioenergy research is expected to be along the lines identified in the current research section. Day-to-day policy analysis would be expected to continue as well. As a unit, we are casting about for additional research interests. The following contains additional information on the "new research" areas that were briefly mentioned in the current research section.

Land use change

Estimating land use changes under alternative future scenarios is becoming increasingly important in the face of climate change and energy price shocks. APAC's POLYSYS tool is useful when linked with other models and data. Policymakers, more than ever, want to know the local future impacts of changes upon the economy, energy use, yield, soil quality, and water quality. Going forward, actively seeking out partners and projects where POLYSYS can be linked with other models to estimate high-resolution impacts of future scenarios will be useful, worthwhile, and fruitful.

Local food systems

The emergence of local food systems has been rapid over the past 10 years. Research into the energy efficiencies and economic rigor of existing local food systems needs to be conducted, as well as an evaluation of alternative mechanisms of growing, transporting, processing and marketing local food. We believe that local food systems research should be more 'hands on' than the conventional means of policy analysis. Besides research, education and extension are also necessary components of these partnerships. Using all three tools of research, education, and extension will allow us to take action at the local level in order to evolve strategies that can be communicated and propagated in other communities nationally.

International development

It has been argued that Africa has a long history of autocracy that stymies the implementation of good governance practices. Research is planned to examine two of the

many pre-colonial democratic traditions, those of the Oromo in Ethiopia and the Haalpulaar along the Sahel from Senegal to Sudan, as models for the development of democratic institutions based on indigenous African customs and traditions.

Research is also planned to identify a strategy for implementing a program that uses leadership training activities to bring about community-directed development in sub-Saharan Africa. William Easterly has characterized the development process that has been used since decolonization as one that depends on experts who bring with them a technocratic solution to the issue of poverty. In the years since the World Food Conference in Rome in 1974 that pledged to eliminate hunger in a decade, the technocratic solution has failed to bring the number of malnourished persons in the world below 830 million—the 1974 level. This research focuses on engaging individuals and their local religious, cultural, and political systems in the process of identifying community problems, needs, and goals and then responding to the self-identified needs of the community working in the form of citizen/farmer-directed activity and research.