

Portfolio Annual Report 2008: Education

**United States Department of Agriculture
Cooperative State Research, Education, and Extension Service
Office of Planning and Accountability**



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Education Portfolio – Executive Summary

“Only by continuing investment in advancing technology – through the education of our children, the development of the science and engineering workforce, and the provision of an environment conducive to the transformation of research results into practical applications – can the full innovative capacity of the United States be harnessed and the full promise of a high quality of life realized.” (National Academy of Sciences, 2007).

This portfolio report represents the first attempt to describe and assess educational programs administered by CSREES during a five-year period (2002-2006). The agency team assembled to take on this task was confronted with numerous challenges, from the initial hurdle of determining the meaning of “education” as it relates to the breadth of CSREES-funded programs to accurately measuring the impacts of such funding on strengthening our partner institutions. Disaggregating these impacts from outcomes achieved by other agencies and organizations added to the challenge, as did an absence of baseline data from which to measure progress. The portfolio team is forthright in pointing out not only the external challenges, but also the programmatic shortcomings within CSREES that contribute to inhibiting greater success.

Despite the difficulties in accurately assessing performance in an area as broad and integrated as education, this portfolio review makes one thing very clear – the emphases of the agency’s educational programs have never been more relevant to meeting critical societal needs than they are today. Our country’s future will depend largely upon our ability to prepare upcoming generations to succeed in an increasingly globalized society. In order to meet tomorrow’s demands, we must be able to reverse the decline in students seeking degrees in agricultural sciences, while enhancing the quality and relevance of their programs. In addition to promoting scientific and technical expertise, this report points out the need to develop a diverse workforce with the intellectual capital, global competence and environmental sensitivity to advance food and agricultural sciences in the U.S.

CSREES’ programs devoted primarily to education are funded at approximately \$140 million, while those secondary programs that target education more indirectly total roughly \$105 million. A significant portion of these funds, especially those administered by the Science and Education Resources Development (SERD) unit support education programs at minority-serving institutions. Minority populations remain significantly underrepresented in food and agricultural science programs at universities nationwide. Funding provided by CSREES to minority-serving institutions is often the only external support they receive to establish and maintain programs in these areas. This report clearly shows that without such support, many of these institutions’ food and agriculture academic programs would be in danger of collapsing.

NPLs feel very strongly that their programs are building institutional capacity and preparing students to enter the workforce. The funding applied to this has been increasing throughout this reporting period. Of the six target areas three appear to receive the most emphasis in our grant programs. These are:

- Curriculum and new program development,
- Teaching methodology and experiential learning, and
- Recruit, retain, train and graduate students prepared to enter the workforce.

The education portfolio programs are responding to the changing needs in food science and agricultural education by incorporating more cutting edge approaches such as distance education, biotechnology, geographic information systems (GIS), international exchange and integration of student applied research. Improvements can be made to enhance the program outcomes and the ultimate goal of supporting and strengthening institutions programs in the food and agricultural sciences.

This portfolio exercise has been an excellent opportunity to review where we have come and where we need to go. While the report provides a review of secondary programs that support and strengthen educational capacity, more importantly it focuses on the primary programs that support minority serving institutions and underserved populations. The report outlines short and long term goals for CSREES as it prepares to reorganize into the National Institute of Food and Agriculture (NIFA). More consideration could be given to how resources are applied to the target areas. As America's food and agricultural system addresses future challenges of globalization, climate change, genetic engineering, and potential food shortages, having a well prepared workforce that is representative of every facet of American society giving people the opportunity and retaining our original mandate to serve all Americans as the "peoples department."

Table of Contents

Section I: Portfolio Overview	1
<i>Portfolio Planning</i>	1
Portfolio Mission Statement	1
Portfolio Vision Statement.....	1
Portfolio Introduction.....	1
Linkage to CSREES Strategic Plan	2
Portfolio Logic Model.....	4
<i>Portfolio Inputs</i>	6
Portfolio Funding.....	6
Primary Programs	9
<i>Portfolio Results</i>	11
Portfolio Outcomes	11
Education Portfolio Leadership and Management.....	13
Programmatic and Management Shortcomings	15
Key Future Activities and Changes in Direction	16
What Are Others Doing	18
Section II: Primary Education Programs	26
Narrative Introduction.....	26
Inputs – Primary Programs	26
K-12 Programs.....	28
Undergraduate Programs	29
Target Areas.....	32
Target Area # 1: Faculty Training and Development	32
Target Area # 2: Curriculum and New Program Development	34
Target Area #3: Recruit, Retain, Train and Graduate Students Prepared to Enter the Workforce	35
Target Area #4: Instructional Materials, Equipment and Facilities.....	38
Target Area #5: Teaching Methodology (Including Experiential and Collaborative Learning).....	38
Target Area #6: Collaborative and Integrated Programs	39
Target Area Synergy	41
Resources	41
Conclusions.....	45
Section III: Secondary Education Portfolio Programs	48
Section Introduction.....	48
Science and Education Resources Development	48
1890 Facilities Grant Program.....	49
1890 Capacity Building Research Grants Program	49
Tribal Colleges Research Grants Program.....	51
Federally-Recognized Tribes Extension Program	51
Tribal Colleges Extension Program	52
Plant and Animal Systems	52
Natural Resources and Environment	54
Economic and Community Systems	55

Families, 4-H and Nutrition	55
4-H and Youth Development	56
Competitive Programs Unit	57
National Research Initiative Competitive Grant Program	57
Cross-Unit Programs	57
Other Education Outputs and Outcomes	59
Section IV: External Panel Recommendations	60
Section V: Self Assessment	61
Introduction	61
Scoring and Comments	61
Section 1 – Relevance	61
Section 2 – Quality	63
Section 3 – Performance	64
Target Area Summary	65
Conclusion	67
Appendix - Section I	1
Table 1: Education CRIS Summary Funding	2
Tables 2: Initial Attempt to Report Funding of Primary Programs by Educational Areas	3
Table 3: Outcomes of Primary Funded Projects by Program and Target Area	15
Table 4: Proposed NPL Program Roadmap	53
Table 5: Partnering Agencies and Organizations	62
Appendix – Section II	63
Table 6: Legislative Authorizations and Eligibility for Primary Programs	64
Table 7: Web Resources for Awarded Primary Funded Projects	68
Table 8: Enrollment by Program Area as Reported in FAEIS 2002-2006	69
Tables 9: Degrees Awarded in the Food and Agricultural Sciences Programs by Degree Level 2002-2006	70
Table 10: Gender of Graduates Across all Degree Levels in Selected Fields	73
Table 11: Ethnicity of Graduates Across all Degree Levels in Selected Fields	74
Table 12: Ph.D Recipients in Selected Agriculture Disciplines 2002-2006	76
Table 13: NPL Summary of Program by Target Area	77
Appendix – Section III	83
Table 14: Legislative Background for Selected Secondary Educational Programs	84
Table 15: Other Science and Education Resources Development (SERD) Programs Making Secondary Contributions to Education Portfolio	86
Table 16: Natural Resources and Environment (NRE) Contributions to Education Portfolio	95
Table 17: Economic and Community Systems (ECS) Contributions to Education Portfolio	101
Table 18: 4-H and Youth Development Contributions to Education Portfolio	107
Table 19: National Research Initiative Competitive Grants Program (NRI) contributions to Education Portfolio	114
Table 20: Educational Contributions of Cross-Unit Programs	123
Acronym Definitions	129

Section I: Education Portfolio Overview

Portfolio Planning

Portfolio Mission Statement

As outlined in the National Agricultural Research, Extension and Teaching Policy Act (NARETPA) of 1977, CSREES is charged with providing national leadership and awarding grant resources to strengthen the education capacity of Pre-K, secondary, community college, four-year college and university systems that support and deliver food and agriculture degree programs as they relate to a central theme. For the purposes of this Education Portfolio Review, the major focus or ‘theme’ of the Cooperative State Research, Education, and Extension Service’s (CSREES) Education Portfolio is to:

Support and strengthen institutions’ educational programs in the food and agricultural sciences.

This theme is realized through six target areas:

1. faculty training and development,
2. curriculum and new program development,
3. recruit, retain, train and graduate students prepared to enter the workforce,
4. instructional materials, equipment and facilities,
5. teaching methodology including experiential and collaborative learning, and
6. collaborative and integrated programs.

These target areas, by strengthening our partner institutions, enhance the development of a competent workforce which is required to meet the challenges of a rapidly changing global food system.

Portfolio Vision Statement

Highly trained college graduates in the food and agricultural sciences who are globally experienced in applied research and extension and are representative of American’s cultural and ethnic diversity.

Portfolio Introduction

The purpose of the Education Portfolio Review is to complete an assessment of the alignment of food and agriculture legislative language and program implementation strategies by CSREES and determine the extent to which the United States Department of Agriculture (USDA) grant funds are being used to strengthen institutions that prepare for and meet future workforce needs in the food and agricultural sciences. This review assesses the responsiveness of grant supported educational partnerships in advancing the mission of USDA and goals of CSREES. It will also provide feedback to CSREES about how the legal authorities and programs might be used to be more responsive to future demographic and educational needs related to institutional strengthening and workforce development in the food and agricultural sciences. Emphasis is

placed on higher education and includes expertise development through the recruitment, retention, training and graduation of students for post-secondary degrees as well as on the institutional development to better enhance the education capacity to produce competent graduates.

This is the first time that CSREES' education programs are part of the portfolio review self assessment process. The unit within CSREES most responsible for providing leadership on national issues relating to the promotion of academic programs in the food and agriculture sciences is the Science and Education Resources Development (SERD) Unit. The primary grant programs under discussion in this review are managed by the SERD Unit. The secondary programs are drawn from SERD as well as other CSREES units.

Linkage to CSREES Strategic Plan

The Education Portfolio supports all of the strategic goals and objectives of the agency in its research, education, and extension activities. However, the closest strategic goal that the Education Portfolio addresses is Strategic Goal 2, Objective 2.2. This portfolio is unique in that its key activities and outcomes are in support of all six strategic goals, where most other portfolios support only one strategic goal.

CSREES Strategic Goal 2, Objective 2.2 is highlighted below to provide background information to encourage discussions by the portfolio team in an attempt to develop future directions and plans.

CSREES Supported Goal

The Education portfolio supports Strategic Goal 2 -- "Enhance the Competitiveness and Sustainability of Rural and Farm Economies." CSREES educational activities are aimed at enhancing the competitiveness and sustainability of U.S. rural and farm economies by building capacity in the agricultural research and extension system and training the next generation of agricultural scientists and educators.

CSREES Supported Objective

The Education Portfolio supports Strategic Objective 2.2 -- "Provide Research, Education, and Extension to Increase the Efficiency of Agricultural Production and Marketing Systems." The Education Portfolio supports education programs designed to develop and transfer technology, practices, and skills to support economically viable farms and ranches of various size and scale.

CSREES Strategic Plan Key Long-Term Outcomes

The following long term outcomes are presented based on CSREES 2007 – 2012 Strategic Goal 2 key outcomes.

Key Long-Term Outcomes:

- | |
|--|
| <ul style="list-style-type: none">• Strengthening masters degree level courses in the food and agricultural sciences, particularly at minority-serving institutions,• Increasing the number of minority students participating in the workforce by funding minority-serving projects at Hispanic serving institutions, 1890 land-grant institutions, 1994 land-grant institutions, Alaska-Native serving, Native-Hawaiian serving institutions. |
|--|

Performance Criteria:

- | |
|--|
| <ol style="list-style-type: none">1. Develop, implement and improve educational processes, needs and methods to achieve educational goals, use and assessment of communication, information delivery, and technology transfer methods and systems. |
|--|

Actionable Strategies

- | |
|---|
| <ol style="list-style-type: none">1. Increase outreach and education supporting the broad view of agriculture from the rural community to the consumption of products thereby gaining communication and input from all stakeholder groups in agriculture2. Support the recruitment, retention, training, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences3. Support research, education and extension efforts to improve understanding of animal nutrition for improved efficiency, performance, health, and well being of animals and to optimize resource use while delivering environmental benefits4. Support research, education and extension to 1) better understand and address consumer needs, tastes, and preferences; 2) inform consumers; 3) provide continuing professional development throughout the agricultural and foods system |
|---|

Portfolio Logic Model

The logic model is a conceptual tool for planning and evaluation. It displays the sequence of how science based programs are conceived, designed, implemented and their resulting outcomes. Variations on logic model constructs and usage abound. The basic construct is:

Situation ↔ Inputs ↔ Activities ↔ Outputs ↔ Outcomes

The Education Portfolio contains a logic model which is utilized to develop, administer and evaluate CSREES Education Portfolio grant programs and is found on the following page. Additionally a flow chart was developed and is utilized to assist with this assessment; it is found in Section II on page 27.

The best way to use a logic model is to begin at the end with the stated outcomes and work backwards toward the inputs. This is to insure that the resulting programs actually achieve the desired outcomes. CSREES strongly encourages and provides continuous training to its program staff to work through logic models as they refine and evaluate their programs. In addition, Project Directors (PDs), grant writers, and evaluators are also encouraged to use the logic model method for their own program development and reporting of results to CSREES.

Good logic models also contain 'Assumptions' and 'External Factors'. These need to be kept in mind as programs are developed and evaluated. For example, the flow chart on page 27 has the assumption that the grant programs working through the six target areas will actually support and strengthen an institution's educational programs.

**Table 1: KA 903 Logic Model for CSREES Education Portfolio
CSREES – Workforce Development in Food and Agricultural Sciences**

Situation	Inputs	Activities	Outputs	Outcomes		
				Knowledge	Actions	Conditions
<p>Challenges or Opportunities</p> <p>Development of future diverse workforce</p> <p>Accessible & accurate educational data on: Enrollment Programs Degrees awarded</p> <p>Communication</p> <p>Global Competency</p>	<p>Investments</p> <p>Federal \$</p> <p>Stakeholder opinions</p> <p>NPL Time & Knowledge</p>	<p>What Occurs</p> <p>Support human capital development</p> <p>Strengthen science literacy</p> <p>Modernize academic capacity</p> <p>Develop academic infrastructure</p> <p>Increase workforce quality & diversity</p> <p>Expand student recruitment</p> <p>Partnerships between all levels of educators & communities</p> <p>International collaborations of US universities & colleges</p> <p>Partnerships to enhance workforce diversity in student training opportunities</p>	<p>What Happens</p> <p>Strategies for workforce development</p> <p>New academic programs & curricula</p> <p>Professional mentoring</p> <p>Undergraduate research experience</p> <p>Internships & experiential learning</p> <p>Projects addressing: - educational capacity - human capital development - information resources</p> <p>New technology for teaching & learning</p> <p>Web based information, courses & degrees</p> <p>Collaborative, adaptive, cost-efficient teaching & training developed</p>	<p>Knowledge generated & applied in teaching & training</p> <p>Improved skills in faculty & students</p> <p>Incorporation of emerging knowledge and technology in teaching and learning</p> <p>Increased knowledge of decision-making, life skills, & positive life choices</p> <p>Increase policy options</p> <p>New methods for multidisciplinary professional preparation</p> <p>Increased percentage of underserved groups matriculating into degree programs</p>	<p>Student recruitment & retention</p> <p>Apply knowledge in workforce development</p> <p>Adopt new skills to function in a technologically-driven world economy</p> <p>Apply information from training & publications</p> <p>Apply bioenergy concepts</p> <p>Enhanced communication in sharing technical information</p> <p>Apply practical policy and decision-making knowledge</p>	<p>Increased technologically & globally competitive, diverse workforce</p> <p>Enhanced institutional capacity for teaching & research at institutions</p> <p>Rapid response with expert knowledge</p> <p>Higher productivity with sustainable environmental practices</p> <p>Partnerships between universities, community college, K-12 Schools, educators & communities</p> <p>Safer food supply with reduced obesity and improved nutrition & health</p> <p>Sustainable practices at all levels</p> <p>Graduate who can think & act critically to solve local & national problems</p>

Portfolio Inputs

The Education Portfolio is identified with a specific knowledge area. Knowledge Area 903 (KA903) is “Communication, Education and Information Delivery”. It is a broad category which is used by the primary programs outlined in this portfolio review but is also used by other secondary programs within CSREES. The distinction between KA903 and other knowledge areas is that KA903 does not focus on any one subject area or discipline and may be complimented by research or extension activities to improve educational capacity. For example, an institution might receive an education award to develop a new degree program in aquaculture with the stated purpose of attracting and graduating students and increasing the number of qualified graduates in this area rather than trying to advance the overall body of knowledge in aquaculture. The focus of the primary grant programs in KA903 is on the theme of **“Support and strengthen institutions’ educational programs in the food and agricultural sciences.”** The secondary programs in this review may focus on a different knowledge area but do so with “communication, education and information delivery” in mind.

Inputs, for the purpose of this review, are defined as the resources, Federal or otherwise, that are available to CSREES in support of the actual grant programs. They reflect USDA’s commitment to fostering strong land grant institutions that can serve the nation in the food and agricultural sciences and the development of the future workforce. Education Portfolio inputs include Federal dollars for grant awards, NPL program expertise, the use of the RFA to target certain priorities, education and workforce data, and stakeholder input. These resources help to make the grant programs relevant and effective at supporting educational programs at our partner institutions.

Portfolio Funding

Federal program funding is the key input that drives CSREES’ Education Portfolio. It also reflects CSREES’ commitment to support and strengthen institutions that produce employable graduates. Funds for both the primary and secondary grant programs are appropriated by Congress each year and identify the award amount for each program.

A review of the Current Research Information System (CRIS) database reveals that KA903 is also funded from other Federal sources. CSREES however, provides on average about three quarters of all KA903 funding of the projects reported in the CRIS system. This information can be seen in Table 1 in Appendix - Section I.

Another example of CSREES’ commitment to food and agricultural science education at the Land Grant institutions is the creation of the separate SERD unit. SERD is important for two main reasons:

- It ensures the primary education supporting programs are not lost in the larger and better funded efforts of the National Research Initiative (NRI) and the research and extension formula funding. While the NRI and the formula funds are substantial, the SERD grant programs represent, for many institutions, the only source of sustained funding for building capacity and strengthening their food and agricultural science departments and graduates.
- Within SERD, and unique to CSREES’ Education Portfolio, are programs designed to address the public benefit of access to food and agricultural science programs by all

Americans. SERD's programs seek to increase the participation of traditionally underrepresented and underserved groups in the food and agricultural sciences.

Some activities, such as the Food and Agricultural Education Information System (FAEIS) and the Teaching Awards Program (TAP) are actually funded by monetary assessments that are levied each year against education grant programs. This is an example of where program legislative flexibility and CSREES creativity meet to produce inputs that add value to the theme.

Table 2 on the following page presents the "Primary Programs of CSREES' Education Portfolio - Award Funding by Education Program FY2002 – FY2006" and indicates that \$141.4 million was appropriated over the five review years. Overall funding increased by 39% over the review period. All of the Primary Education grants grew substantially in the five-year period with one exception, Secondary and Two-Year Post Secondary Challenge (SPEC) program, decreased by one percent. The Hispanic Serving Institutions (HSI) program had an increase of 70% in funds.

Table 2 does include the Tribal Endowment program, which is an interest-based formula fund and the Agriculture in the Classroom (AITC) program which is not a true grant program. When isolating these two programs, and analyzing the remaining 10 programs, there was a 37% increase over the five year time period which was approximately \$128.3 million.

It would have been useful to be able to determine the percentage of funds that were allocated to each target area. There is no clear-cut methodology for doing this. Since most individual awards focus on multiple target areas; there is no systematic way for PDs to indicate which target areas they are emphasizing. Additionally, CSREES interpretation of which target area is being addressed is highly subjective making the analysis difficult. Tables 2 in Appendix - Section I represent an early attempt at allocating across education categories but even these do not directly correspond to the six target areas. It is recommended that a methodology be adopted in order to deepen the analysis of the projects being funded.

Table 2: Primary Programs of CSREES' Education Portfolio - Award Funding by Grant Program						FY 2006 vs. FY 2002	
Program Name	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	\$ change	% change
Agriculture in the Classroom	\$600,000	\$695,000	\$622,000	\$730,000	\$856,000	\$256,000	43%
Secondary and Two-Year Postsecondary Agriculture Education Challenge Grants	\$926,238	\$959,762	\$827,871	\$920,057	\$917,408	-\$8,830	-1%
1890 Capacity Building Grants (Teaching)	\$4,450,663	\$5,358,118	\$5,346,444	\$5,689,126	\$5,821,300	\$1,370,637	31%
Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grants	\$2,709,833	\$3,145,592	\$2,994,650	\$3,321,866	\$3,076,690	\$366,857	14%
Higher Education Challenge Grants	\$4,057,395	\$4,644,639	\$4,565,407	\$5,207,203	\$5,324,535	\$1,267,140	31%
Hispanic-Serving Institutions Education Grants	\$3,329,579	\$3,877,121	\$4,422,889	\$5,333,377	\$5,656,296	\$2,326,717	70%
International Science and Education Grants	*	*	*	\$1,275,180	\$1,895,106	\$619,926**	49%
Resident Instruction Grants for Institutions Higher of Education in Insular Areas	*	*	*	\$370,000	\$469,189	\$99,189**	27%
Tribal Colleges Education Equity Grants	\$1,549,000	\$1,688,950	\$1,679,035	\$2,232,000	\$2,304,310	\$755,310	49%
Tribal Colleges Endowment Fund	\$1,427,450	\$1,700,723	\$1,852,655	\$2,093,477	\$2,474,263	\$1,046,813	73%
Multicultural Scholars	\$955,000	\$994,000	*	\$1,582,000	\$1,041,000	\$86,000	9%
National Needs Graduate Fellowships Grants	\$5,708,513	*	\$33,470	\$5,629,260	\$6,024,000	\$315,487	6%
Total	\$25,713,671	\$23,063,905	\$22,344,421	\$34,383,546	\$35,860,097	\$10,146,426	39%

* No Funds Appropriated
** Change compared between first year of appropriation and FY 2006.
Total Funds 2002-2006 \$141,365,640

Primary Programs

The primary programs included in this Education Portfolio which will be discussed in detail in Section II include:

K-12 Programs:

- Agriculture in the Classroom (AITC)
- Secondary and Two-Year Postsecondary Agriculture Education Challenge Grants Program (SPEC)

Undergraduate Programs:

- 1890 Institution Teaching Capacity Building Grants Program (CBG-Teaching)
- Alaska Native- and Native Hawaiian-Serving Institutions Education Grants Program (ANNH)
- Higher Education Challenge Grants Program (HEC)
- Hispanic-Serving Institutions Education Grants Program (HSI)
- International Science and Education Competitive Grants Program (ISE)
- Resident Instruction Grants for Institutions of Higher Education in Insular Areas (RIIA)
- Tribal Colleges Education Equity Grants Program (TCEG)
- Tribal Colleges Endowment Fund
- Multicultural Scholars Program (MSP)

Graduate/Postgraduate Programs:

- National Needs Graduate and Postdoctoral Fellowships Grants Program (NNF)

Secondary Programs

The secondary programs involved in this review come from the CSREES units listed below. They may focus on other knowledge areas but are being addressed for their contribution to KA903. They will be discussed in detail in Section III. Table 3 on the following page details the funding for secondary grant programs. These include the following units:

- SERD's 1890 and 1994 Research Grants
- Competitive Programs,
- Economic and Community Systems,
- Natural Resources and Environment,
- Families 4-H and Nutrition, and
- Plant and Animal Systems.

Table 3: Secondary Programs of CSREES' Education Portfolio - Award Funding by Grant Program

Program Name	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2006 vs. FY 2002	
						\$ change	% change
National Research Initiative	\$112,514,357	\$154,922,022	\$150,890,080	\$165,013,411	\$166,788,575	\$54,274,218	48%
Evans-Allen Program	\$32,665,863	\$33,401,147	\$33,753,694	\$34,622,381	\$35,093,951	\$2,428,088	7%
1890 Facilities	\$12,960,000	\$14,306,400	\$14,315,040	\$16,105,636	\$15,944,861	\$2,984,861	23%
1994 Research Program	\$934,128	\$1,022,908	\$1,017,012	\$1,009,293	\$958,750	\$24,622	3%
1890 Capacity Building Grants (Research)	\$4,363,207	\$5,229,097	\$5,192,743	\$5,629,402	\$5,399,239	\$1,036,032	24%
Sustainable Agriculture Research	\$11,700,000	\$12,786,345	\$11,440,223	\$11,606,400	\$11,490,336	-\$209,664	-2%
McIntire-Stennis, Cooperative Forestry	\$20,685,713	\$20,539,663	\$20,555,921	\$20,979,070	\$20,794,402	\$108,689	1%
Grants to Youth Serving Institutions	\$8,000,000	\$2,861,280	\$2,560,483	\$2,539,837	\$1,900,800	-\$6,099,200	-76%
Hatch Act, Formula Funds	\$170,148,537	\$168,780,503	\$168,895,764	\$168,461,863	\$166,770,283	-\$3,378,254	-2%
Water Quality	\$12,348,392	\$12,268,127	\$10,976,152	\$12,241,295	\$12,088,829	-\$259,563	-2%
Food Safety	\$14,248,584	\$14,155,968	\$12,666,394	\$14,122,916	\$13,922,701	-\$325,883	-2%
Avian Influenza	*	*	*	*	\$1,404,000		
Total	\$400,568,781	\$440,273,460	\$432,263,506	\$452,331,504	\$452,556,727	\$51,987,946	13%
*No Funds Appropriated							
Total Funding, FY 2002-2006: \$2,177,993,978							

Portfolio Results

Portfolio Outcomes

The outcomes of the six target areas which support the theme are presented in Sections II, III and V. Additionally, Table 3 in Appendix - Section I provides outcomes of specific projects as reported by the project director in the final report by grant program and also indicates the specific target area which the project focused upon. Changes in knowledge, actions and conditions as a result of all of CSREES activities can be seen in the target areas across the five-year review period. This section will address some of the challenges and opportunities at CSREES' partner institutions that the grant award programs seek to address.

Highly significant changes are sweeping through agricultural production, economics, social behavior, and policies that will require an informed and flexible approach to education, research, and extension. In agricultural production, there are continued advances in biotechnology, precision farming, disease epidemiology, and animal and plant nutrition that will improve efficiency and the quality of agricultural products. The development of new food and non-food products such as fuel, paint, plastics, pharmaceuticals and nutraceuticals from agricultural or other bio-based materials will expand the market for agricultural commodities. Bioenergy innovations promise to minimize U.S. dependence on foreign oil. Other macro-trends need attention as well. Global demographics and economic forces are rapidly changing the economics of U.S. agriculture as well as the way rural communities live and do business. In order for U.S. agriculture to compete effectively in today's global market, efforts must be made to better understand global markets, their interdependencies and to improve business and marketing practices to help make farms and agribusinesses more successful.

Globalization is only one facet of change in food and agriculture. Community supported agriculture and organic and sustainable production systems have a focus on healthier individuals, communities and the environment. Choices about energy and natural resource usage, conservation, food production, and processing all may have, as of yet, unforeseen consequences.

This makes one thing very clear – our educational institutions – from kindergarten through post doctoral - will need to be more informed, more flexible, and more responsive to both global and local challenges. Because of this, local, national and international policies should be used to strengthen our institutional offerings to develop a diverse workforce with the intellectual capital, global competence and environmental sensitivity to contribute at all expert levels in the U.S. food and agricultural sciences.

Because of the way legislation authorizes individual grant programs, teaching, research and extension are often treated and funded as separate initiatives. This reinforces similar divisions at our client institutions. In reality, research and extension programs are closely linked to and complement teaching activities at land-grant and non land-grant institutions. Additionally, both research and extension programs are integral to graduate education,

through which trained personnel entering the workforce are prepared to confront future food and agricultural sciences challenges. The programs that are reviewed in this portfolio demonstrate contributions to advancing the educational achievement of Americans in the food and agricultural sciences.

‘Outcomes’ can best be described as answering the question – ‘What has changed as a result of the inputs, activities and outputs?’ If the overall theme is to support and strengthen institutional education programs in the food and agricultural sciences, what change has occurred as a result of the awards? As the flow chart on page 27 indicates, baseline indicators are largely missing from this portfolio. While there is some attempt to collect numbers of students or faculty impacted by our grant awards, a comprehensive effort to capture these numbers is absent.

Because CSREES is not the only Federal agency dedicating funding to KA903 programs, it is difficult to analyze the overall graduation and employment data and determine with any certainty the degree to which CSREES programs have contributed to these figures. Other USDA agencies, the Department of Education (DEd), National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), and National Oceanographic and Atmospheric Association (NOAA), to name a few, also provide institutions with grants to develop their educational capacity.

Another difficulty in sifting out CSREES’ contribution is the fact that the institutions themselves are changing the way they report student enrollment in degree programs in the food and agricultural sciences. Many colleges and universities are folding the traditional agriculture degree programs into larger departments that included natural resource and environmental science or into family and consumer/human science departments.

The central question: Is CSREES advancing education through the six target areas to meet the central theme? There is ample anecdotal evidence to suggest that this is happening but it remains largely undemonstrated. The central assumption of the Education Portfolio is that resources directed into the grant programs produce competent graduates that are employed in the food and agricultural sciences. This is done through the six target areas in strengthening institutions.

Sections II and III demonstrate that the grant programs are addressing the six target areas. Faculty are being trained and exposed to new technologies and teaching methodologies. New programs and curricula are being developed across the major food and agriculture disciplines. A majority of the projects awarded focus on recruiting underserved students, especially minorities, into food and agriculture science programs who might otherwise not choose these fields of study. Retention and developmental programs reach students that are at risk. Several programs focus primarily on building capacity as it relates to facilities, equipment and instructional materials, especially at minority serving institutions. Due to changes in technology, faculty are invoking new methods of teaching, though distance learning and providing students with opportunities for experiential and collaborative learning which provides hands-on experience transferable to the workforce. Collaborative and integrated programs are becoming more prevalent in

order to expand understanding of agriculture as it relates not only to education but to business and government domestically as well as internationally. Finally, opportunities for students to become involved in various workplace experiences both here and abroad are increasing.

Our assistance to meet the needs of minority serving institutions is often the only external support these institutions receive to create and maintain programs in the food and agriculture sciences. Without CSREES' education grant programs, many minority serving institutions' food and agriculture academic programs would most likely collapse.

Education Portfolio Leadership and Management

While the funding streams determine a large part of CSREES' efforts to support and strengthen educational programs, there is latitude within the authorities to respond to needs and opportunities at our target institutions. Within CSREES, SERD is the only unit that has a dedicated education portfolio. Competitive Programs and the other units' grant awards do contribute to education in a secondary fashion. This means that the Deputy Administrator and the three directors within SERD are primarily responsible for program leadership of agency education programs. Portfolio program management falls primarily to the nine NPLs within SERD. The degree to which this contributes or not to the overall effectiveness of the education programs was not directly addressed by this assessment but should not be ignored.

Portfolio leadership comes from external sources as well. Stakeholders are individuals who have a significant interest in how CSREES leads and manages its education programs. They are being increasingly sought after for their feedback and creative ideas on how to make our grant programs better. They provided feedback into the development of program Rules and Regulations. They provide ideas and recommendations for the RFAs. Additional input is gathered either formally or informally by SERD program staff at:

- project director meetings,
- site visits to client institutions,
- application peer reviewers,
- national associations aligned to food and agricultural sciences,
- groups representing land-grant and non-land grant institutions,
- unsolicited input from the general citizenry,
- colleagues from other Federal and non-Federal entities that fund education, and
- input from individual students.

Once stakeholder input is received, priority setting and allocation of resources is accomplished through discussions with CSREES managerial staff and in alignment with USDA Strategic Goals, agency objectives and national needs. The degree to which this is done is dependent on non-institutionalized mechanisms and could be greatly improved. Inter-unit collaboration while growing in importance also needs to be improved.

There are more needs to be addressed than available funding for food and agricultural education. Through RFA program announcements, CSREES' NPLs provide leadership that responds to educational needs which address issues such as:

- agricultural biosecurity, bioenergy, obesity, and Avian Influenza,
- declining enrollment in traditional agricultural sciences, and
- recruitment and retention of students from groups traditionally underrepresented in the food and agricultural sciences to enhance diversity and be reflective of the nation.

A growing trend for program development is for NPLs to provide incentives to align the education grant programs with the strategic plans or mission statements of individual institutions, colleges or departments. Because of an increasing tendency towards more competitive programs, institutions are being encouraged to build their programs around areas of expertise or to address needs and opportunities. If this alignment takes place grant programs should become more effective.

Because of the great need and limited funding, a better use of limited grant funding can be realized by encouraging:

- multi-institutional collaboration,
- targeted educational need areas as priority award categories, and
- increasing the relative proportion of integrated (research, extension and education) work.

These approaches use Federal funding to leverage additional external resources.

In the management of the Education Portfolio, CSREES' NPLs use the RFA program announcement for education grants to provide direction to applicants and anticipate changes to address educational needs by incorporating the following:

- curricula development, instruction and learning outcomes,
- teaching capacity development (faculty training and professional upgrades)
- innovation in teaching at the K-12 and postsecondary education,
- undergraduate and graduate education,
- targeted workforce development and global experience and competency,
- promoting opportunities for underserved populations,
- internships and fellowships, and
- state-of-the-art equipment, facilities and methodologies.

NPLs continuously refine initiatives and concepts in the RFA to evoke projects from applicants to respond to current and emerging needs and goals. This takes into account the needs of applicant institutions, USDA and the nation. In order to increase the accountability for producing outcomes, the RFA provided applicants with information on the state of food an agriculture from sources such as:

- Food and Agricultural Education Information System (FAEIS),
- National Center for Education Statistics (NCES),
- Survey of Earned Doctorates, and
- Food and Agriculture Employment Outlook.

Management of pre- and post-awards is a demanding, complex set of processes. The pre-award process involves a variety of activities some of which are:

- solicit stakeholder input,
- refine the language of the RFA to reflect current priorities,
- receive and review applications,
- set up peer review panel,
- rank applications,
- recommend amounts and finalize award contracts, and
- communicate with applicants regarding final award status.

At any one time within SERD there are 700 active awards which need attention and oversight. While this is the responsibility of a number of CSREES units, SERD program staff is responsible for ensuring these processes are accomplished. These require post-award activities that include:

- review and approval of annual, final and delinquent reports,
- provide guidance and training on impact writing,
- planning and implementing program director conferences,
- monitoring program expenditures and funding draw downs,
- approving award actions such as no cost extensions, PD changes, etc.,
- gathering data on awards for presentations to stakeholders and Congress,
- maintaining Unit and CSREES web site,
- Site visits at institutions, and
- Ensure terms and conditions are being followed.

Institutional clientele, eligible for the majority of the primary programs in the Education Portfolio, require greater attention to the pre- and post-award processes. Because the administration of these primary portfolio programs is within a separate unit, the question is: Are the processes in place to adequately administer the programs to achieve the desired results.

While the portfolio assessment did not specifically address education leadership and management of the programs, much can be gleaned by making adjustments and improvements in how SERD manages its education programs and relates to the larger portfolio of CSREES’.

Programmatic and Management Shortcomings

A few of the Education Portfolio shortcomings have already been mentioned. Below is a summary.

- CSREES has no agreed-upon definition or description of what comprises ‘education’.
- CSREES has no agreed-upon definition as to what comprises ‘capacity building’.
- CSREES has no agreed-upon agency-wide education goals or objectives.
- KA903 serves as a catch all for any educational type activity.
- The agency has no agreed-upon matrices (metrics) for measuring success of its education programs. Current CSREES education programs do not uniformly call for PD’s to indicate measurement of success.
- SERD NPLs are primarily used to manage the pre- and post-award processes.
- RFA requirement for project evaluation is uneven across the programs and not adequately enforced.
- There is no agency-wide group that reflects upon the challenges, opportunities and shortcomings of CSREES’ education portfolio.
- There is no officially coordinated planning among SERD’s leadership to monitor national food and agriculture education policy issues nor a mechanism to incorporate subsequent changes into program RFAs.
- CSREES grant reporting mechanisms are often created without adequate feedback from program NPLs.
- CSREES needs a better and more accessible web-presence for education.
- CSREES needs a comprehensive education roadmap for advancing its own vision and mission as well as that of its individual programs. (See Table 4 Appendix - Section I)
- Education grant programs have not had the same level of stakeholder input that other CSREES grant programs have had.
- Administration of some education grant programs is particularly challenging due to underserved institutions having less capacity to understand and process requirements.

Key Future Activities and Changes in Direction

This review illustrates that CSREES’ Education Portfolio grant award programs and NPL program initiatives are addressing national priorities as well as regional and institutional needs. The Education Portfolio is a responsive effort by CSREES, through unique partnerships with Federal agencies, educational institutions, and the private sector, to assess the impact of the programs delegated to this agency. This review also points to the fact that CSREES can do more to make its educational partnerships and grant programs effective. A few short- and long-term goals are provided below to address this opportunity:

Short-Term Goals:

- Better evaluation and performance metrics for STEM and agricultural related sciences
 - Better reporting of program outcomes by PDs and educational institutions
 - Increasingly rigorous program evaluations using multiple strategies
- Reaching outcomes that are realized beyond the life of the grant award

- Align goals and metrics to those pre-defined by national academic organizations
- Agency wide coordinated RFA language and initiatives
- Convene an internal CSREES education advancement committee or advisory group
 - Cutting across all agency units
 - Agree on definitions, roles, goals and future activities to advance education in the food and agricultural sciences
 - Monitor education policy issues and provide a feedback function to those concerned
 - Make CSREES structural recommendations to better facilitate program work
 - Represent CSREES at national educational bodies and groups
 - Make staff position recommendations on advertising for key vacancies
 - Invest in and provide incentives to current staff that excel and need to be retained

Long-Term Goals:

- Determine priorities for pre-K-20 STEM Education Portfolio programs and initiatives
- Activity to determine focus for the next 10 years and to develop an innovative incubator for ideas, products and discoveries
- Develop and refine an education roadmap with national association bodies and with sufficient stakeholder input (See Table 4 Appendix - Section I).

The “*Food, Conservation, and Energy Act of 2008*” (2008 Farm Bill) provides a challenge for CSREES and its successor agency to develop new approaches to address the agency’s education mission. There are multiple examples of Federal agencies that have defined their national education role. With the numerous statutory authorities that provide the mandate to carry out educational activities and with the legislation of the 2008 Farm Bill, CSREES has the opportunity to explore additional funding for educational activities, for defined national impact. Using existing budget line items, across the agency, funding opportunities would focus on:

- curricula development,
- student training,
- teacher enhancement, and
- student stipends/scholarships.

For CSREES, advancing goals for a national high-impact issue, such as bioenergy, can be addressed within a single funding opportunity announcement with blended funding from “research,” “education,” and “extension” appropriations.

CSREES will hone and refine its education goals until satisfied that the critical few that will achieve real significant impact are found. Goals simple and relevant to stakeholders, and ensure they align with the USDA Strategic Goals and the new agency Road Map that

will be developed as mandated in the “*Food, Conservation, and Energy Act of 2008*” (2008 Farm Bill).

What Are Others Doing

Fellowship, traineeship and scholarship programs are offered by various federal and non-federal entities. The commonalties are that they are geared to address areas of importance to the nation and to reduce the debt burden as students gain knowledge to participate fully in the emerging knowledge economy. This listing is only a summary of some of the more predominant entities who work to meet the theme of supporting and strengthening institutions’ education programs in food and agricultural sciences.

National Science Foundation

The National Science Foundation (NSF) has been responsive to the national need to increase the numbers of students completing degrees in Science, Technology, Engineering and Mathematic (STEM) disciplines. There are awards made annually to support student and faculty to advance the intellectual competence of the nation in STEM education. As examples, NSF offers the Alliances for Broadening Participation in STEM (ABP) solicitation includes the Louis Stokes Alliances for Minority Participation (LSAMP) program, Bridge to the Doctorate (BD) Activity, and the Alliances for Graduate Education and the Professoriate (AGEP) program. This portfolio seeks to increase the number of students successfully completing quality degree programs in science, technology, engineering and mathematics (STEM). Particular emphasis is placed on transforming STEM education through innovative academic strategies and experiences in support of groups that historically have been underrepresented in STEM disciplines: African Americans, Alaskan Natives, Native Americans, Hispanic Americans and Native Pacific Islanders.

The National Science Foundation also offers the Integrative Graduate Education and Research Traineeship (IGERT) program, initiated in 1997. The IGERT program has been developed to meet the challenges of educating U.S. Ph.D. scientists, engineers, and educators with the interdisciplinary backgrounds, deep knowledge in chosen disciplines, and technical, professional, and personal skills to become in their own careers the leaders and creative agents for change. The program is intended to catalyze a cultural change in graduate education, for students, faculty, and institutions, by establishing innovative new models for graduate education and training in a fertile environment for collaborative research that transcends traditional disciplinary boundaries. It is also intended to facilitate greater diversity in student participation and preparation, and to contribute to the development of a diverse, globally-engaged science and engineering workforce.

National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA) offers the National Estuarine Research Reserve System’s Graduate Research Fellowship which provides Master’s degree students and Ph.D. candidates with an opportunity to conduct research of

local and national significance that focuses on enhancing coastal zone management. Fellows conduct their research within a National Estuarine Research Reserve and gain hands-on experience by participating in their host reserve's research and monitoring programs. Graduate Research Fellowship projects are based on the reserves' local needs, the reserve system's national priorities and the students' interest.

U.S. Department of Education

The U.S. Department of Education offers the Jacob K. Javits Fellowships Program that provides fellowships to students of superior academic ability – selected on the basis of demonstrated achievement, financial need, and exceptional promise – to undertake study at the doctoral and Master of Fine Arts level in selected fields of arts, humanities, and social sciences. A board establishes the general policies for the program, selects the fields in which fellowships are to be awarded, and appoints distinguished panels to select fellows.

The Fund for the Improvement of Postsecondary Education (FIPSE) is a unit in the U.S. Department of Education's Office of Postsecondary Education that annually conducts the comprehensive grant program intended to support innovative educational reform projects that can serve as national models for the improvement of postsecondary education. FIPSE runs competitive grant programs that are specifically focused such as the international competitions that provide funding for joint or dual undergraduate degrees in a wide range of academic and professional disciplines. Other programs support consortia of institutions of higher education to promote cooperation in education and science between, for example, Russia and Brazil, with the United States.

National Aeronautics and Space Administration (NASA) Education Programs

In the NASA Strategic Plan, the Agency articulates three major education goals, which are designed to continually support U.S. innovation and competitiveness now and in the future:

- a. Strengthen NASA and the Nation's future workforce — NASA will identify and develop the critical skills and capabilities needed to achieve the U.S. Space Exploration Policy. To help meet this demand, NASA will continue contributing to the development of the Nation's science, technology, engineering and mathematics, or STEM, workforce of the future through a diverse portfolio of education initiatives that target America's students at all levels, including those in traditionally underserved and underrepresented communities.
- b. Attract and retain students in STEM disciplines — To compete effectively for the minds, imaginations and career ambitions of America's young people, NASA will focus on engaging and retaining students in STEM education programs to encourage their pursuit of educational disciplines critical to NASA's future engineering, scientific and technical missions.

- c. Engage Americans in NASA's mission—NASA will build strategic partnerships and linkages between STEM formal and informal education providers. Through hands-on, interactive, educational activities, NASA will engage students, educators, families, the general public and all Agency stakeholders to increase Americans' science and technology literacy.

The two main goals of NASA's education program are to "inspire and motivate students to pursue careers in science, technology, engineering, and mathematics" by supporting education in the Nation's schools and to "engage the public in shaping and sharing the experience of exploration and discovery" by supporting informal education and public outreach efforts. NASA's commitment to education places special emphasis on these goals by increasing elementary and secondary education participation in NASA projects; enhancing higher education capability in science, technology, engineering, and mathematics, or STEM, disciplines; increasing participation by underrepresented and underserved communities; expanding e-Education; and expanding NASA's participation with the informal education community.

The Office of Education will continue to support NASA's strong historical role in education at all levels, with linkages to NASA research as a central part of our focus. The majority of NASA support to higher education is delivered through the NASA Mission Directorates.

The NASA Office of Education supports the work of the Mission Directorates by coordinating projects for students, faculty, and institutions that broaden the base of those who compete for NASA research awards. These efforts will help create and sustain the scientific and engineering workforce of the future. In addition, the Office of Education will continue to emphasize sharing the results of NASA missions and research programs with wider audiences by using science discoveries and research applications as vehicles to improve teaching and learning at all levels.

The NASA Office of Education, in their portfolio programs, identified targeted audiences: students, educators, faculty research and fellowships and grants. The NASA education programs are managed through divisions: Elementary & Secondary Education; Higher Education; Informal Education; Technology & Products Office; and Education Flight Projects Office.

The NASA education programs at the elementary and secondary levels are designed to:

- Increase the rigor of science, technology, engineering, and math experiences provided to K-12 students through workshops, summer internships, and classroom activities;
- Provide high quality professional development to teachers in science, math, engineering and technology through NASA programs;

- Develop technological avenues through the NASA web site that will allow families to have common experiences with learning about space exploration;
- Encourage inquiry teaching in K-12 classrooms;
- Improve the content and focus of grade level/science team meetings in NASA Explorer Schools; and
- Share the knowledge gained through the Educator Astronaut Program with teachers, students, and families.

At the higher education level, the NASA programs seek to:

- Catalyze institutional development to prepare colleges and universities to be better able to compete for NASA research awards;
- Increase the candidate pool of qualified faculty who can compete for NASA research awards;
- Build connections, through partnership and consortium awards, that provide institutions of higher education and other educational entities building better bridges for students who want to pursue a career in STEM fields;
- Facilitate improved coordination between NASA-sponsored university research activities and teacher preparation projects to expose teachers-in-training to NASA research and discoveries, thus furthering their understanding of STEM disciplines;
- Provide fellowship and scholarship opportunities to attract "the best and the brightest" students to NASA disciplines.

In 2006, NASA developed the Science and Technology Scholarship Program. This scholarship-for-service program provides both scholarship and internship opportunities to undergraduate students pursuing degrees in engineering, mathematics, computer science and physical/life sciences. This competitive program was developed to attract students who excel in science, technology, engineering or mathematics to compete for a full scholarship of up to \$20,000 per year - in exchange for a commitment to work full-time at a NASA center or one of its affiliates upon graduation. Additional stipend support of up to \$10,000 per year supports a required internship or research experience at a NASA center or affiliate.

U.S. Department of Energy

The U.S. Department of Energy, Office of Science: The Office of Science is the single largest supporter of basic research in the physical sciences in the United States, providing more than 40 percent of total funding for this vital area of national importance. It oversees – and is the principal federal funding agency of – the Nation’s research programs in high-energy physics, nuclear physics, and fusion energy sciences.

The Office of Science manages fundamental research programs in basic energy sciences, biological and environmental sciences, and computational science. In addition, the Office of Science is the Federal Government’s largest single funder of materials and chemical sciences, and it supports unique and vital parts of U.S. research in climate change, geophysics, genomics, life sciences, and science education.

The Office of Science manages this research portfolio through six interdisciplinary program offices and sponsors a range of science education initiatives through its Workforce Development for Teachers and Scientists program. The Office of Science makes extensive use of peer review and federal advisory committees to develop general directions for research investments, to identify priorities, and to determine the very best scientific proposals to support.

The Office of Science is a principal supporter of graduate students and postdoctoral researchers early in their careers. About a third of its research funding goes to support research at more than 300 colleges and universities nationwide. In addition, about half the users at Office of Science user facilities are from colleges and universities, providing further support to their researchers. To attract and encourage students to choose an education in the sciences and engineering, the Office of Science also supports the National Science Bowl®, an educational competition for high school and middle school students involving all branches of science. Each year, DOE's National Science Bowl® attracts over 17,000 students nationwide. At the high school level, it involves more than 12,000 students, and at the middle school level, more than 5,000 students. The Office of Science also reaches out to America's youth in grades K-12 and their teachers to help improve students' knowledge of science and mathematics and their understanding of global energy and environmental challenges.

Private Businesses

Pioneer Hi-Bred International

Recognizing the shortage in plant breeders, Pioneer Hi-Bred International has established the Pioneer Hi-Bred Graduate Fellowship at Iowa State University to identify, recruit and retain the graduate scholars, whose main research focus will center on seed issues. The students may enroll in agronomy, agricultural engineering, plant pathology, horticulture, economics, entomology or other departments in the College of Agriculture.

DuPont

DuPont will fund fellowships at UW–Madison, Cornell University, North Carolina State University, the University of Illinois and the University of Minnesota. DuPont also is providing universities with \$675,000 to support a competitive fellowship program for students with a confirmed interest in plant breeding research.

The Alfred P. Sloan Foundation

The *Sloan Research Fellowships* are awards to enhance the careers of the very best young faculty members in specified fields of science such as evolutionary molecular biology, computer science, mathematics, physics, neuroscience, economics and chemistry. The A.P. Sloan Foundation manages two innovative graduate scholarship programs focusing on increasing the number of underrepresented American minorities in mathematics, the natural sciences, and engineering graduate programs. The Minority Ph.D. Program offers eligible doctoral candidates the opportunity to pursue their Ph.D. degrees with financial, mentoring, and guidance support through recognized participating faculty and department

approved by the Sloan Foundation. The American Indian Graduate Program (AIGP) was initiated in 2003 through a partnership between the University of Arizona and the Sloan Foundation; it was expanded in Fall 2005 to include the participation of select faculties and departments at the University of Montana, Missoula and Montana Tech of The University of Montana, Butte.

Professional Science Master's Program

The Sloan Foundation initiated funding for a new type of Master's degree in the sciences that equips people for work outside academia. The impetus is to spur a significant movement in such training through support of exemplary efforts at selected U.S. universities. The focus is on the Professional Science Master's degrees, heavily oriented toward coursework, requiring a full-time student two years to obtain. The success of these programs required that they be aligned with the interests of both the faculty and students. The foundation's grants encourage three forms of Professional Science Master's degrees:

- Those that deepen a student's knowledge beyond what can be learned in a four-year course of study, but stay within a disciplinary domain, for example, acoustics;
- Those that fuse scientific fields at a level of depth and complexity hard for undergraduates to achieve; in many cases, the fusion may be with computer or information sciences;
- Those that integrate study in the natural sciences and mathematics with knowledge and training in management, law, or other professional domains.

Professional Societies and Organizations

National Future Farmers of America

Scholarships: Each year the National FFA Organization (formerly referred to as National Future Farmers of America) awards more than \$2 million in scholarships to members. There are many types of scholarships to fit the many types of FFA members. Scholarships are given for a wide variety of experiences, career goals and higher education plans. Different awards may be used at colleges, universities and post secondary agricultural programs. The scholarships are sponsored by numerous agricultural businesses through the National FFA Foundation, and new scholarships are added every year.

Partners in Active Learning Support

Partners in Active Learning Support (PALS) - is a mentoring program that matches high school agriculture students with elementary youngsters who have special needs. Developed by the National FFA Organization, the program helps those involved to build trust in others and develop positive self-esteem, both of which are critically lacking in many of today's challenged young people. Through this program, high school and elementary students alike explore their interests in plants, animals and the world around them. They get excited about school and through these special one-to-one relationships, they develop stronger social skills.

PALS was designed to meet the changing needs of our society. One of the biggest changes of the last decade is in the American family structure. The "Norman Rockwell" family--a working father, housewife mother and two children--comprised only six percent of all family units during the last decade and this number continues to decrease.

Contrast this trend with the fastest growing group in our country, the prison population. America's prison population grew 139 percent from 1980 to 1990. Of those in prison, 82 percent are high school dropouts. The best way to reduce crime rate is not to build more jails, but to keep kids in school and give them a positive, productive alternative such as PALS.

Team Ag Ed

Team Ag Ed is a united effort in promoting local program success and includes the following organizations and groups:

National Postsecondary Agricultural Student Organization

The National Postsecondary Agricultural Student Organization (PAS) is an organization associated with agriculture/agribusiness and natural resources offerings in approved postsecondary institutions offering baccalaureate degrees, associate degrees, diplomas and/or certificates.

PAS is one of the ten career and technical student organizations that has been approved by the U. S. Department of Education as an integral part of career and technical education

National Young Farmer Educational Association

National Young Farmer Educational Association (NYFEA) is the official adult student organization for agricultural education as recognized by the United States Department of Education. As an association that educates agricultural leaders, NYFEA unites members from the individual farmer to large corporations.

American Association for Agricultural Education

American Association for Agricultural Education (AAEG) is dedicated to studying, applying, and promoting the teaching and learning process in agriculture.

National Council for Agricultural Education

The National Council for Agricultural Education (NCAE) will be the premier leadership organization for shaping and strengthening school based agricultural education (SBAE) at all levels in the United States.

State Level Programs

Georgia Department of Education: Agricultural Education

Agricultural Education is composed of three distinct, yet interrelated components. A basic component is classroom and laboratory experiences. In the classroom, students learn concepts and theories dealing with a broad spectrum of agricultural and

agribusiness topics. The classroom is followed by the laboratory mode of instruction where concepts and theories are carried through to their application. Here, the students are taught "hands-on" skills that ensure that the skills learned are practical and usable.

Both classroom and laboratory instruction are put to use in the Supervised Agricultural Experience Program (SAEP) component of the program. In this approach, students work and learn in a real-life situation where they obtain on-the-job skills. SAEP can vary from the traditional home projects to entrepreneurship or cooperative work experience in production or agribusiness.

The third component, the Georgia FFA organization, provides an avenue for developing leadership skills. As an integral, intracurricular component of the agricultural education program, the FFA has numerous systems to deliver instruction in leadership. In addition, FFA provides incentives for improved student performance through its awards program.

Local Level Programs

Monterey (CA) County Agricultural Education, Inc.

- AgKnowledge is a partnership program of Monterey County Agricultural Education, Inc. and Grower-Shipper Foundation. This Executive Seminar Program provides policy makers, educators, media, and other community leaders the opportunity to "walk in the shoes of a farmer", to see Monterey County through the eyes of those involved in the many facets of agriculture.
- Education and Agriculture Together (EAT) is an educational program directed toward school superintendents and administrators. Every year EAT allows administrators to connect personally with those involved in the agricultural industry. The administrators learn about science and technology involved in agriculture, the wide variety of careers available, and the potential opportunities for students. It also gives agriculture employers the chance to let educators know what they look for when hiring employees.

Advocacy for Agriculture - Monterey County Agricultural Education offers community awareness with a huge variety of advocacy and ag visibility presentations. Middle school teachers learn about how to incorporate agriculture into classroom lessons; local youth groups discover the difficulties of harvesting a crop, but feel the satisfaction of providing food for others; government and private industry visitors learn the unique qualities of Monterey County agriculture and the progressive science and modern technology used in the industry. The organization works in as many venues as possible. It offers group and individual tours, speakers for classrooms, and fair and community event exhibits. We do our best to work will all specific requests.

Other organizations that partner and collaborate with grant recipients are seen in Table 5 in Appendix - Section I.

Section II: Primary Education Programs

Narrative Introduction

The theme of the Education Portfolio is:

To support and strengthen institutions' education programs in food and agricultural sciences.

This is accomplished through six (6) target areas:

1. faculty training and development,
2. curriculum and new program development,
3. recruit, retain, train and graduate students prepared to enter the workforce,
4. instructional materials, equipment and facilities,
5. teaching methodology including experiential learning, and
6. collaborative and integrated programs.

The uniqueness of this Education Portfolio, as distinguished from other previously submitted portfolios, is that education awards do not focus upon any one academic discipline, nor do they emphasize any one particular approach to supporting education. CSREES funds a wide diversity of education initiatives that support multiple target areas. This may include:

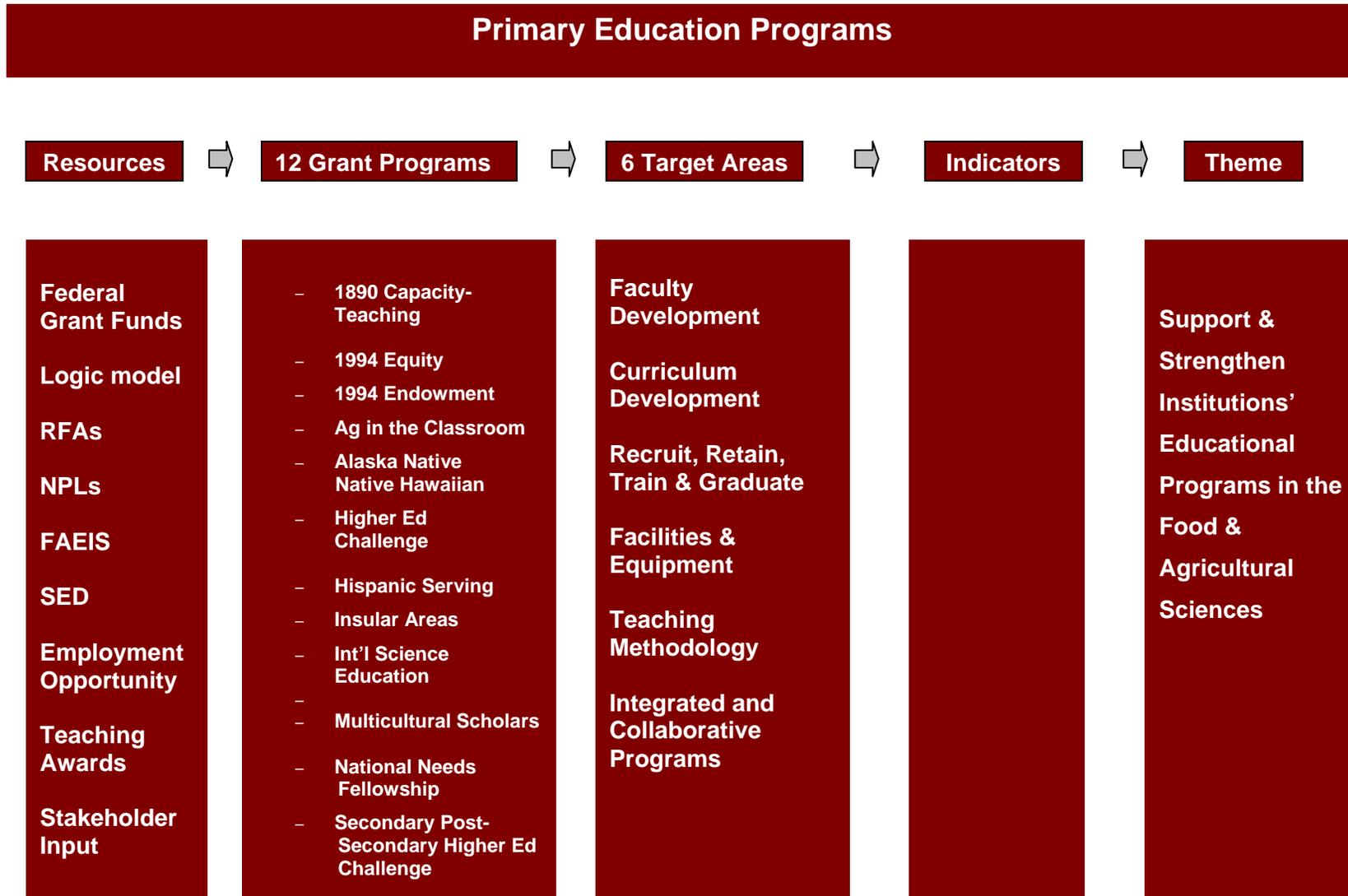
- updating courses with new and emerging concepts,
- helping faculty understand how to develop more effective teaching styles to address changing student needs, and
- introducing recruitment and retention strategies that attract a more diverse student body into the agricultural sciences workforce.

The development of the Education Portfolio centers around twelve (12) primary education grant programs which exist within CSREES. Section III focuses on programs in CSREES that provide secondary support to the education portfolio.

Inputs – Primary Programs

The Education Portfolio has identified 12 primary programs focusing on k-20 education that work through six target areas to support the theme. In addition, nine (9) critical resources are available to assist the programs in focusing on these target areas. (See flow chart, Table 4, on the following page.) This section describes the programs, resources and target areas and their interaction in strengthening institutions' education programs in the food and agricultural sciences,

Table 4: Flow Chart for Primary Education Programs



The following programs have specific legislative authorities given to CSREES by Congress. These legislative authorities determine the target areas which support the theme. Legislative Authority for education programs have come to CSREES in a piecemeal fashion. In most cases, Congress authorized funding programs over the last two decades as separate initiatives in response to stakeholder needs (See Table 6 in Appendix – Section II for a listing of authorizing legislation). CSREES staff administer the programs in response to relatively specific Congressional authorizations and appropriations. There is little authorization for the agency to make major changes to authorized programs. In general, appropriate priorities can be set within programs, general priorities may be set across some programs, but programs must be administered within Congressional stipulations.

K-12 Programs

Agriculture in the Classroom (AITC)

AITC is a nationally-coordinated, locally executed, science education program. The program is carried out in each state according to state needs and interests by individuals representing farm organizations, agribusiness, education and government. USDA supports the state groups by:

- helping to develop Agriculture in the Classroom programs,
- acting as a central clearinghouse for materials and information, and
- encouraging USDA agencies to coordinate and assist the state programs and national organizations to promote the goal of an increased awareness of agriculture among the nation's students.

The AITC program operates independently in each state using various funding sources, including some Federal support. The National Office provides coordination and funding to State projects, sponsors the National Conference, provides web-based resources, and staffs the National Consortium of AITC State Contacts.

Secondary and Two-Year Postsecondary Agriculture Education Challenge Grants Program (SPEC)

The SPEC program is open to all public, and private non-profit, secondary schools as well as community and junior colleges throughout the nation. All Federal funds competitively awarded under this program must be matched by the institution on a dollar-for-dollar basis from non-Federal sources. The intent of the program is to encourage teachers to creatively incorporate elements of agriscience and agribusiness into secondary education programs. By enhancing teaching, the SPEC program seeks to attain the following program goals:

- increase the number of students pursuing and completing a two - or four-year postsecondary degree in the food and agricultural sciences,
- help students achieve their career goals, and
- help meet workplace needs by increasing the quality of secondary and postsecondary instruction.

Undergraduate Programs

1890 Institution Capacity Building Grants Program - Teaching (CBG)

CBG stimulates high quality teaching programs that build institutional capacity at the 1890 Land-Grant Institutions. This is a competitive grants program that in the food and agricultural sciences that includes: teaching, faculty development, applied research, and experiential learning activities. The CBG program goals are:

- advance cultural diversity of the food and agricultural scientific and professional workforce by attracting and educating more students from underrepresented groups,
- strengthen linkages among the 1890 institutions, other colleges and universities, USDA, and private industry, and
- enhance the quality of teaching programs make the 1890 institutions more competitive in the U.S. higher education system.

Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grants Program (ANNH)

This program's appropriated funds are divided equally between the states of Alaska and Hawaii for post-secondary institutions. After allocation, the funds are awarded competitively within each state. The program carries out education, applied research, and related community development programs in the food and agricultural sciences. The program's main goals are:

- strengthening k-12 readiness and interest in the food and agriculture sciences at post-secondary institutions,
- increasing the number of ANNH students entering food and agriculture sciences at the college level by working across two or more institutions, and
- strengthening institutional educational capacities and instruction delivery systems to respond to state, national or international educational needs.

Higher Education Challenge Grants Program (HEC)

The HEC program is a competitive program that awards teaching enhancement grants to U.S. public or private non-profit colleges and universities offering a baccalaureate or first-professional degree in at least one discipline or area of the food and agricultural sciences. Educational institutions receiving grants are required to match USDA funds on a dollar-for-dollar basis from non-Federal sources. HEC awards help classroom educators improve the quality of instruction and the capability of tomorrow's graduates to enter the workforce as well-prepared technicians and professionals. By enhancing teaching, the HEC Program seeks to attain the following two program goals:

- increase the number of graduates with a baccalaureate (or higher) degree in the food and agricultural sciences, and
- increase the quality of postsecondary instruction within these disciplines.

Hispanic-Serving Institutions Education Grants Program (HSI)

This grants program is the foundation of USDA efforts to better serve Hispanic Americans and to prepare them for careers in agriscience and agribusiness. This competitive program expands and strengthens academic programs in the food and agricultural sciences at Hispanic-serving colleges and universities, including two-year community colleges that have at least 25 percent Hispanic enrollment. The HSI program is managed to promote and strengthen the ability of Hispanic-Serving Institutions to carry out higher education programs that attract, retain, and graduate outstanding students capable of enhancing the nation's food and agricultural scientific and professional work force.

International Science and Education Competitive Grants Program (ISE)

This competitive program awards grants to eligible public and private colleges and universities offering a four-year degree program or higher. ISE will improve the ability of American students, business people, and community members to compete more effectively in global agriculture. It also supports partnerships and collaborative teaching, research, and extension in agriculture and related fields. The major goals of the ISE program are:

- recognize the need to educate Americans about the world beyond our borders by bringing the benefits of international collaboration back to our nation's classrooms, laboratories and communities, and
- better understand of the domestic implications of globalization in a wide variety of areas.

Resident Instruction Grants for Institutions of Higher Education in Insular Areas (RIIA)

This is a competitive program instituted in 2005 that awards teaching enhancement grants to public or private non-profit colleges and universities located in Insular Areas, and to consortia of such eligible institutions. It focuses its limited funding on encouraging the insular area institutions to submit a single, collaborative application to build capacity to offer improved education through sharing essential resources. RIIA's two main program goals are:

- increase the number of graduates with an associate (or higher) degree in the food and agricultural sciences, and
- help students achieve their career goals and help meet workforce needs by increasing the quality of undergraduate instruction.

Tribal Colleges Education Equity Grants Program (TCEG)

This is a non-competitive program among 33 eligible 1994 Land Grant Tribal institutions. Annual appropriations are awarded equally among the institutions. They are designed to enhance educational opportunities for Native Americans by strengthening instructional programs in the food and agricultural sciences. Recognizing that strengthening instructional programs is an ongoing process, the TCEG program is funded over multiple years and designed to strengthen institutional capacity. The TCEG program has a number of characteristics:

- highly responsive to identified state, community, regional, national and international educational needs,
- four-year continuation program to build on a theme over several award years,

- designed to build on an institutional strategic focus, and
- incorporate indigenous knowledge and culture.

Tribal Colleges Endowment Fund

The Tribal Colleges Endowment Interest Fund benefits the 1994 Land Grant Tribal institutions by building institutional capacity to deliver and strengthen education, research and extension. These funds for Tribal Colleges are being used in two broad areas: to building infrastructure and the recruitment and retention of faculty, staff, and students. Overall, these funds provide Native American students with the infrastructure to obtain an associates degree and move on to a major four-year degree granting institution in the food, agriculture, and natural science areas. These funds also raise the Tribal College's abilities to:

- distance education infrastructure to access courses at major universities,
- improve faculty skills through training and advance degrees,
- construct, renovate, and equip classrooms and scientific laboratories,
- recruit and retain of Native American students, and
- leverage resources from other sources for institutional construction.

Multicultural Scholars Program (MSP)

This competitive program awards grants to four-year public or private colleges and universities. All awards require a 25% match non-Federal sources. Funds provide for a limited number of undergraduate scholarships and experiential learning opportunities in support of students in the food and agricultural sciences. The major goals of MSP are:

- advance the national goals for Science, Technology, Engineering and Mathematics (STEM),
- designated for food and agricultural sciences baccalaureate and Doctor of Veterinary Medicine (D.V.M.) degree training to meet the increasingly advanced technological needs of the food and agricultural sciences workforce, and
- mentoring students to ensure matriculation and entry into graduate education or the workforce.

Graduate/Postgraduate Programs

National Needs Graduate and Postgraduate Fellowships Grants Program (NNF)

This is a competitive graduate traineeship program that awards grants to four-year colleges and universities. Funds provide for a limited number of graduate fellowships and international dissertation research opportunities in support of students in the food and agricultural sciences. Additional postdoctoral training may also be provided for Fellows who have completed their doctoral degrees. The NNF goals include:

- train students for master's and/or doctoral degrees and provide postdoctoral training for Fellows who have completed their doctoral degrees and provide International Study or Thesis/Dissertation Research Travel Allowances (IRTA) award postdoctoral training in areas where there is a national need,

- address the higher cost of graduate education, provides access to beneficiaries from diverse groups who may not participate in graduate education for the national Science, Technology, Engineering and Mathematics (STEM) initiative within the domain of food and agricultural sciences, and
- address the issues of emergent workforce needs and professional mentorship related to graduate education for students from traditionally underrepresented groups.

These 12 primary programs highlight the theme of strengthening education in the fields of food and agricultural sciences by focusing on six specific target areas. These target areas are described below. Selected examples of awards are provided to illustrate how programs work through the target areas to address the overall theme. For illustrative purposes, only a representative sample of the awards is provided. All awards can be examined through the Current Research Information System (CRIS) or in program summary reports found on the web. Selected reports can be found in Table 3 Appendix - Section I (See also Table 7 Appendix - Section II for web resources).

Target Areas

For the Education Portfolio, the building blocks for strengthening education are enumerated in six target areas listed at the beginning of this section. The cornerstone of the target areas is the focus on faculty and faculty development. Without competent, well trained faculty, the remaining five target areas are less effective. Each of the six target areas will be discussed in detail and selected examples of how CSREES education programs support and address the theme are presented. It should be noted that the projects which are described in the various target areas frequently focus on several rather than one target area.

Target Area # 1: Faculty Training and Development

Well trained innovative faculty is the foundation for improving education and for all of the other target areas supporting delivery of education programs in the food and agriculture sciences. Faculty Training and Development has the following critical elements, faculty are:

- relevant and up-to-date within their field of study,
- experienced and trained in teaching methods,
- passionate about educating a diverse population of students,
- innovative with new learning techniques,
- engaged with peers, both domestic and international, for professional development,
- proficient in the use and have access to state-of-the-art equipment,
- collaborative with other institutions, government, and business,
- actively evaluate and publish or present their research, teaching or extension projects, and
- compensated by the institution for excellence.

What follows is a description of some of the projects funded through the primary education grant programs which exemplify faculty training and development.

Agriculture in the Classroom (AITC) promotes an Excellence in Teaching about Agriculture: An Awards Program. This program seeks to recognize the outstanding efforts of educators in teaching about agriculture. This competitive program recognizes teachers for successful efforts in adopting an agricultural curriculum. Teachers are selected by a panel of experts for their

outstanding contributions to education about American agriculture. Funding supports travel expenses for each winning teacher to attend the National Agriculture in the Classroom Conference, the purchase of educational materials, and professional development.

Through the Secondary and Two-Year Postsecondary Agriculture Educations Challenge Grant (SPEC) in 2002 to Seacoast School of Technology for a project entitled Pioneering Biotechnology Education in New Hampshire which established a Network of New Hampshire (NH) teachers and resources with a focus upon agricultural biotechnology and training to integrate this technology into current curricula. Students developed a New England Museum of Science GMO display and an Agricultural-Biotech Curriculum Guide, as well as participated in Agricultural-Biotech regional workshops with the result of integrating agricultural biotechnology into the NH science curriculum. This funded institute provided over 200 NH teachers with the academic resources necessary to integrate agricultural-based biotechnology lessons and labs into traditional biology curricula.

A project funded through the Higher Education Challenge Grant (HEC), awarded in 2003 to the University of Illinois established a National Learner-Centered Teaching network of college teachers who share interests in active, inquiry, and service learning across the disciplines in food, agricultural, and environmental sciences. This program explores techniques and describes the use of learner-centered methods by teaching faculty in colleges of agriculture in the United States. Increased knowledge and use of learner-centered teaching methods, coupled with more accessible teaching resources, result in students who learn and retain discipline knowledge and skills at higher rates than those without this exposure. The three, techniques addressed in this project are:

- Active Learning - used to engage students to learn key concepts and knowledge,
- Inquiry Learning - used to encourage students to apply the key concepts and knowledge in real-world situations, and
- Service Learning - used to engage students to apply the concepts and knowledge in the real-world by helping improve the quality of life for people in local communities.

A project funded through the Capacity Building Grant (CBG), awarded in 2003 to North Carolina State A & T University, focused on Strengthening the Biotechnology Program. The award addresses a shortage of well-trained biotechnologists and the emphasis on faculty development in the area of biotechnology is particularly important. The project also included faculty from middle and high school science programs to ensure pre-college students have the basic competencies to succeed in a university degree program. Selected students were engaged in a rigorous program of course work, faculty mentored research projects, and workshops by outside private sector experts. This project utilized:

- merit-scholarships,
- enhanced laboratory experiences,
- infrastructure enhancements, and
- library acquisitions.

An award made through the International Science and Education Grant (ISE) to Virginia Polytechnic Institute and State University (Virginia Tech) in 2005 built upon an existing relationship with the University of the Free State (UFS) in South Africa to expand opportunities for research, teaching, extension and student exchange. Virginia Tech faculty participating in

this program have acquired new knowledge in such areas as plant disease management and forestry in dry-land environments.

Target Area # 2: Curriculum and New Program Development

This target area focuses on the development or improvement of degree, course or other educational training programs that encourage students to enter the food and agriculture science fields. This target area includes:

- relevance with national, local and student needs and expectations,
- supportive of institutional strategic plan,
- incorporation of innovative and effective teaching and learning styles,
- research based science supportive of the food and agricultural disciplines,
- preparing students to obtain a bachelor, graduate or post graduate degree,
- meeting employers requirements, and
- involving multidisciplinary fields of study.

Agriculture in the Classroom National Resource Directory (NRD) is an online database which lists hundreds of educational materials about agriculture. It was designed to assist educators in locating high quality resources about agriculture for a Pre-K through 12th grade. The materials are searchable by title, agricultural content, grade level, academic subject, media type and area of the country addressed in the resource. It is designed to highlight some of the best educational resources available for incorporating agriculture into the classroom. The resources cover a variety of agricultural subjects including:

- lesson plans,
- children's literature,
- CDs and videos,
- posters,
- educational kits, and
- instructional websites.

More than seventy-nine (79) projects funded through the Hispanic-Serving Institutions Education Grants (HSI) awarded from 2002-2006 have focused on curriculum and new program development. For example, in 2003, the Biology Department at California State University at San Bernardino instituted an undergraduate degree track in Ecology and Evolution, designed to accommodate students with interests in conservation biology and natural resources which:

- increased student enrollment in classes and programs in natural resources and conservation biology,
- fostered interest and success at entering careers in these fields, and
- supported curricular changes that will enhance the success of future students in these fields.

A grant awarded in 2004 through an Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grant (ANNH) to Ilisagvik College (IC) in Alaska developed numerous state and local partnerships to study lifestyle issues relevant to health and nutrition. These partnerships enabled IC to expand nutrition related course offerings within the school. Through this project, community leaders and active community members have recognized the importance

of health and nutrition related fields and embraced the college's goal to educate the community and encourage the growth of local employment.

Two grants awarded by the Resident Instruction for Insular Areas Grant (RIIA) to the eight institution consortium (CariPAC) in 2005 and 2006 focused on the need to develop more rigorous agricultural sciences coursework, and to then deliver this instruction over a vast, underdeveloped network of small, technologically-challenged islands. Funding helps to secure competent faculty who then engage in delivering updated curricula to outlying schools that do not have the expertise to offer a wide range of agricultural science courses. Some coursework has been updated and new faculty are in the process of being hired.

The United Tribes Technical College utilized Tribal Endowment funds to plan and develop two additional degree programs focusing on nutrition. College faculty working with faculty from an 1862 institution together are working with local community organizations to develop formal and community educational programming in diets, tourism management, Type 2 diabetes, and culinary arts.

A National Needs Graduate Fellowship (NNF) award, in 2006, was made to The Ohio State University, to create an interdisciplinary graduate training program in Rural Sociology for master's level students. The master's degree fellowship focused on training skilled, engaged, committed scholars who, on graduation, will make use of and contribute to the food and agricultural system by engaging in basic and applied interdisciplinary research, policy making, and analysis. Training is targeted at two primary audiences: those wishing to pursue a career in food, agricultural, and environmental sciences, and those wishing to do further academic study and research on these topics.

During the period of this review the Higher Education Multicultural Scholars (MSP), provided competitive grants to eligible colleges and universities that have designed baccalaureate and D.V.M. degree training programs that will:

- prepare graduates to meet the demand for highly qualified personnel,
- pipeline more undergraduates into graduate education, increasing the representation of diverse cultural groups,
- address the gap between White, Latino, African American, First American and other populations entering graduate schools,
- promote students' success at the undergraduate/D.V.M. level, and
- focus on student learning and outcomes to ensure matriculation and entry into graduate education or the workforce.

These projects focus not only on new program development but also the recruitment, retention, training and graduation of students in preparation to enter the workforce relating to food and agricultural sciences. This critical target area supports the theme not only by developing new educational programs, but also preparing the next generation of agricultural scientists to meet the workforce needs of the nation.

Target Area #3: Recruit, Retain, Train and Graduate Students Prepared to Enter the Workforce

This target area proactively develops student skills, interests, aptitudes and opportunities to enter into food and agricultural degree programs. It works hand in hand with the area of curriculum development in developing attractive programs which students will gravitate towards and ultimately graduate in and enter the workforce. Specifically this target area focuses on:

- elementary level teacher training, and innovative modules,
- developing creative and fun science-based learning activities,
- orienting incoming students to campus life,
- developing campus cultural and intellectual diversity,
- utilizing distance education to attract students who otherwise may not be able to attend college courses,
- enhancing comprehensive, developmental education programs,
- involving the private sector through internships and visiting experts,
- providing financial support,
- identifying at risk students with targeted developmental programs, and
- increasing public relations and marketing of programs through career fairs, web access, and brochures.

All of these factors aid in communicating the importance of education and specifically education in the food and agriculture sciences. The education and graduation of students beginning at the elementary level and continuing through to the graduate level will meet the workforce needs of the economy. The projects listed below focus on this target area and are integrate with the other five areas.

The National Needs Graduate Fellowship Grant (NNF) focuses on recruiting students and providing training at the graduate level to train a new generation of agricultural professionals, empowered with an integrated understanding of policy, agricultural sciences, production agriculture, food systems analysis, and environmental resource management. In 2006 the Agriculture, Food and Environment (AFE) Program at Tufts University received funding to educate students to evaluate the environmental, political, economic and social aspects of food production and distribution. The AFE Program is using the National Needs Fellowship award to train master's level graduate students.

A Higher Education Challenge Grant (HEC) awarded in 2005 to Salish Kootenai College (a 1994 Land Grant Institution) supported the establishment of the first, four-year forestry program at a Tribal college. Native American students are under-represented in the forestry profession and enrollment in four-year forestry programs is very low. This project created an opportunity for Native Americans to become professional foresters by receiving education on Tribal lands that emphasize natural resource management concepts unique to Tribal forestry operations. Funding supported the creation of an accredited forestry degree program that has increased recruitment, retention and graduation of Native American students. Numerous partnerships with Tribal organizations and the U.S. Forest Service have enhanced recruitment as well as provided locally relevant instructional materials and research and internship opportunities. This project is an excellent example of cooperation between two CSREES grant programs in that students have been supported with scholarships awarded under the Higher Education Multicultural Scholars Program (MSP).

In 2003, Multicultural Scholars Grant (MSP) awarded funds to South Dakota State University to support 10 Native American students who transferred from Tribal colleges to pursue a

baccalaureate degree in Animal Science, Natural Resources and Nutrition. All of the scholars actively engaged in undergraduate research projects under a mentor faculty member who shared their cutting edge research in their respective disciplines.

In 2005, Kentucky State University (KSU) received a Capacity Building Grant (CBG) to combine curricula development in Environmental Sciences. KSU faculty established a collaborative partnership with local schools to develop a comprehensive environmental education program. In partnership with KSU Environmental Education Center, workshops were offered in hands-on field study and research. These K-12 teacher training and student programs made it easy for students to enroll in related KSU degree programs. This program utilized the following innovations:

- student experiential learning,
- k-12 science awareness development modules,
- pre-college teacher training,
- student recruitment and retention, and
- diversity in the workforce development.

Over the period of the Education Portfolio, more than thirty (30) Hispanic-Serving Institutions (HSI) projects have been funded to meet local educational needs in agriculture and coordinating efforts with other institutions and with private industry. Two four-year institutions in south Texas that serve a population with very low income and educational attainment, were able to recruit, retain, and graduate students of Hispanic descent into undergraduate programs in biology and biotechnology. Participating students increased their investigatory skills in DNA/RNA analysis through applied research opportunities. This experience encouraged all students to complete their degrees.

Another HSI project in California facilitated the transfer of students from three two-year colleges to a four-year Agricultural Studies Program (a 2+2 transfer module). This project doubled the number of students enrolled in the Agricultural Studies Program and increased the number of underrepresented students. This was completed through the development and implementation of recruitment visits to community colleges in California. These visits exposed students to the 2+2 transfer module and the program also awarded scholarships to students.

The Alaska Native-Serving and Native Hawaiian- Serving Institutions Education Grants (ANNH) awarded funds in 2002 for the development of the Hawaii Community College Forest TEAM and Hawaiian Lifestyles Program which recruited students in elementary and high schools. It offered internships, summer courses for high school students, posters at public forums, direct mailing of brochures, career fairs, other community activities, and sponsored open houses. Government agencies such as the National Parks, US Fish and Wildlife, Hawaii Department of Land and Natural Resources, USGS Biological Research Division, and private employers such as Forest Solutions are employing Forest TEAM graduates.

In addition to recruitment, working partnerships with high schools and with Hawaiian charter schools are functioning and expanding. New faculty have been hired by both programs. Students are graduating with skills that are helping to improve the restoration and management of native forests, traditional taro and traditional fish ponds, thus adding to the sustainability of the Hawaiian ecosystems and food systems.

Recruiting and retaining students is more effective when used in conjunction with other target areas. This aspect is reinforced in each of the program RFAs. Project impacts reported in the CRIS system reflect the ability of institutions to utilize multiple target areas to address the theme of supporting education in the food and agricultural sciences.

Target Area #4: Instructional Materials, Equipment and Facilities

This target area focuses on providing adequate as well as state of the art teaching materials, lab equipment, library resources, classroom facilities, and buildings. In the development of this, institutions spotlight:

- institutional strategic plans,
- plans to replace aging and outdated facilities and equipment
- leveraging additional resources through collaboration and new technology delivery systems, and
- new facilities for faculty and student use.

A Secondary and Two-Year Postsecondary Agriculture Education Challenge Grant (SPEC) was awarded in 2006 to the predominantly Hispanic Firebaugh Las Deltas Unified School District. This award funded a fully-functional chemistry and biotechnology laboratory, enabling instruction in college-level laboratory techniques. The opportunity to gain practical skill in analyzing data, and being exposed to college-level topics that transfer to upper-division programs has attracted many more students to the agriculture program. Through an articulation agreement with the local college, and through internships at science based agricultural employers, students became better prepared for local science based agricultural careers. Support produced five agricultural science courses for 9th and 10th graders, and provided release time for faculty to align first- and second-year high school agricultural course with University of California credit requirements. An articulation agreement between the high school and local community colleges is now in place.

During the reporting period, over twenty-two (22) HSI projects have been funded to improve instructional scientific equipment available to students to ensure a well-qualified labor force that meets industry standards and supports the Nation's food and fiber system. For example, the University of Puerto Rico-Mayaguez recruited students in the disciplines of environmental and molecular biology and animal science to participate in research experiences using state-of-the-art equipment.

Specific grants are awarded to support facilities, especially the facilities at 1890 Land Grant institutions through the Facilities Grant Program which is administered in SERD. This program is discussed in Section III of the Education Portfolio.

Target Area #5: Teaching Methodology (Including Experiential and Collaborative Learning)

This target area focuses on an active process to continually improve course and information delivery. It is a more applied and practical problem solving approach to learning and teaching. Enhancing student-faculty transactional and interactive learning relationships (talking with the students) using:

- innovative approaches to student engagement and learning styles,
- faculty training,
- resources available to experiment with new programs and methods,
- leadership that promotes and rewards innovation, and
- stakeholder input and institutional and private sector collaboration.

The Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grants (ANNH) awarded funds in 2006 to the University of Alaska Southeast-Ketchikan to develop the UAS Ketchikan Fisheries Technology Program. The fisheries technology program targeted rural schools, during and after school programs, faculty advising and mentoring before, during and after program enrollment, and a specific training session in one shellfish industry. Further, student internships, paid for by the fisheries and aquaculture industry, placed students in Federal and state fisheries agencies and in the salmon culture industries in the region. Extensive partnerships between the University of Alaska Southeast-Ketchikan, rural schools, regional fisheries and aquaculture employers have improved access to higher education and employment of rural and Native Alaskans in their home communities. This program focused on the following areas:

- access to higher education in fisheries and aquatic sciences,
- ongoing training and educational opportunities, and
- experiential learning opportunities in fisheries and aquaculture.

An Equity award to Dine' College included the following program highlights:

- development of an A.S. degree program in Environmental Science,
- faculty training in Environmental Science from Washington State University,
- built a distance education capability,
- incorporated student research into the teaching curriculum,
- outfitted labs on three Dine' campuses with new and more relevant equipment and supplies, and
- placement of student interns with the National Park Service.

A Higher Education Challenge Grants (HEC) was awarded in 2005 to Montana State University. Its focus was to increase the recruitment of highly-motivated students to enter postsecondary programs in the environmental sciences. Out of this, the Stream Side Science project was developed to provide discipline competency via on-line distance education coursework. This project included a partnership with faculty from Utah State University to develop a western region approach to delivering hydrology-related instruction. Ultimately, the project produced a suite of on-line water quality courses that also included unique laboratory and field components to increase the academic rigor and experiential learning component for students.

Target Area #6: Collaborative and Integrated Programs

Shrinking resources and the development of new technology are allowing the promotion of diverse learning and educational partnerships that leverage outside resources to afford students with the best possible educational opportunities. Programs that are cross cutting and combine research, teaching and extension to address local and national needs and opportunities are encouraged in the following ways:

- providing incentives through the RFA,
- utilizing knowledge from applied research to train students and solve real life problems,
- utilizing new technology to bring together outside expertise, resources, and information, and
- thinking outside the university or college walls.

The Agriculture in the Classroom (AIRC) Enrichment Grant was established in 2003 to strengthen state programs by funding innovative ideas and proven outreach strategies to increase agricultural literacy among teachers and their students. The projects must:

- address a state, regional, or national educational need,
- addressing this need through creative or nontraditional approaches that can serve as a model to others, and
- that must encourage and facilitate better relationships in the education community.

Fort Peck Community College (FPCC) has been using the Tribal College Equity Grants and Endowment awards as well as other USDA grant programs to build a distance learning capacity within the college. This program allows FPCC to set up infrastructure obtain for the online services and the instructional costs associated with this program, such as telecommunication, internet services and associated distance learning costs. FPCC is use existing articulation agreements to tap into agriculturally related sciences courses from Montana State University-Bozeman and Rocky Mountain College and other Tribal Colleges to expand curriculum and agricultural offerings. The college capability is also accessible to community entrepreneurs such as farmers and ranchers who can access technical and market information to make their enterprises more profitable and sustainable.

An International Science Education (ISE) award was made to Kansas State University (K-State) to strengthen the international dimension of their graduate and undergraduate curriculum. This program includes modules from Uganda, Lebanon and New Zealand in their “Comparative Food and Agricultural Systems” course. The course curriculum has already been shared and implemented at the University of Florida; Auburn University and the University of Arkansas are considering including the course in 2009. Through the course modules, students are learning the financial, economic, political, agronomic, meteorological, topographical, and animal husbandry advancements and constraints of each economic region relative to the import and export of food and food products. This project cuts across the multiple target areas not only of collaboration nationally and internationally but also enhanced curriculum and prepared students for the workforce.

In 2003, the University of Hawaii system was awarded an Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grant (ANNH). This project, in partnership with the UH system of nine consortia members/campuses, undertook an integrated effort to strengthen Agriculture and Natural Resource Management Science Education (ANRM) in Hawaii to increase the number of students that entered the fields of bio-technology and bio-products development, as well as in sustainable agricultural and ecosystems. The program not only enhanced institutional capacity for teaching at K-12 and higher levels, but also increased Native student enrollment, technological and global competitiveness. Through hands-on training, student internships, new technical skills, biological engineering, new partnerships with businesses and local communities were developed.

Target Area Synergy

The ability of an institution to attract, educate and graduate a diverse, underrepresented and technically savvy high school student requires a new approach informed by an array of institutional educational competencies.

While a few of the primary education grant programs work primarily through one target area (because of legislative mandate, type of eligible institution or to affect a particular set of outcomes), the remaining primary education programs mostly address multiple target areas.

Programs such as Multicultural Scholars or National Needs Fellowship support underrepresented students in the food and agricultural sciences at an institution in which they are enrolled instead of supporting the institution. This is particularly effective in reaching individual students who show promise or who have financial need. MSP and NNF also have the flexibility to support other education programs. For example a 1994 Land Grant College developed a four year program in Forestry through a Higher Education Challenge grant and MSP supported this initiative by awarding scholarships to Native students who were enrolled in the program – allowing both the students and the degree program to succeed.

Overall, the theme of strengthening institutions' academic programs in the food and agricultural sciences is advanced by CSREES education grants that fund programs in multiple target areas. This is not legislatively mandated nor is it required in our RFAs. Institutions and program directors are increasingly submitting applications that utilize an approach that supports education on a number of fronts. There are many examples (Table 3 in Appendix - Section I) where an award will fund a new set of courses or a degree program. The award will also train faculty, provide stipends for student recruitment, equip classrooms with the latest computer or diagnostic equipment, and construct the course content in a relevant and culturally appropriate manner. Individually, any one of these target areas might not be successful, but the combined package becomes a powerful tool for attracting young high school students into food or agricultural degree programs that are relevant to them and to future employers.

SERD utilizes resources and tools to support the theme and encourages applicants to utilize them in the development of their proposals and projects. The resources and tools will be discussed in the following section.

Resources

SERD has at its disposal various resources utilized by National Program Leaders (NPL) and institutional partners to support the overall theme. They are diverse in nature and serve to strengthen and focus the grant programs. Some of the resources provide insight into the current state and future trends of education while some of the tools are particularly useful in shaping projects that are relevant to meeting the needs of today's students and challenges in today's education environment. Nine resources have been identified as working in tandem with the target areas. Each resource will be discussed individually to explain how it adds value to the overall process.

Resource #1: Federal Grant Funds

Federal funding for the 12 grant programs is presented in Table 2. These are dollars that drive the grant award. They have been discussed in Section I on page 8.

Resource #2: Logic Model

A logic model is a systematic way of analyzing inputs and activities to achieve desired outcomes. Programs often do not achieve the outcomes that the activities are designed to realize. A logic model forces program designers to start with the outcomes and work backwards to properly orient the inputs and activities. Once a logic model is implemented it is easier to measure and evaluate the desired outputs against expected outcomes. A logic model can be used in many different ways; specifically it has been valuable in organizing the Education Portfolio Review. NPLs and Project Directors are continually encouraged and trained to apply a logic model to their programs.

Resource #3: Request for Applications (RFA)

The Request for Applications is one of the more powerful resources available utilized to target the grant programs. It is a solicitation for eligible institutions to submit applications to particular grant programs. RFAs are based on the legislative program authorizations and the Code of Federal Regulations that govern the programs. The RFA, a legal document, provides the basic information on what, how, who, where and when the grant is processed, managed and implemented. It is used to promote the theme of advancing education in the food and agriculture sciences. Although CSREES creates the RFA, stakeholders are asked and strongly encouraged to provide input to make it a more relevant document. It is within the RFA that the theme and target areas are enumerated. Because the education grant authorities are deliberately broad and flexible, the RFA allows for annual revisions to take advantage of the evolving opportunities for advancing education.

Resource #4: National Program Leaders (NPL)

National Program Leaders are the key contacts who provide the knowledge and experience through informed leadership. NPLs are responsible for assembling and directing the inputs which refine the RFA. Programs are more effective when NPLs have their finger on the pulse of changing educational needs. This is accomplished through encouraging stakeholder input, targeted site visits and continued participation in professional development. This allows NPLs to make changes to the RFA based on the stakeholder feedback and the changing needs of the nation. NPLs also ensure programs are tied to institutional strategic plans which make the programs more effective. They develop allied program initiatives in support the overall theme. NPLs also engage in other activities which support the development of education within CSREES and outside the agency.

Resource #5: Food and Agricultural Education Information System (FAEIS)

FAEIS is another resource which is funded by contributions from the various education grant programs. National higher education data for food, agriculture, natural resources, family & consumer sciences/human sciences, veterinary medicine and other related disciplines reside within FAEIS. It is a web based data collection system hosted and maintained by Virginia Tech; data are collected annually through a voluntary effort at institutions across the U.S. utilizing a Classification of Instructional Programs (CIP) taxonomy related to Food and Agricultural Sciences. FAEIS is a one-stop food and agricultural sciences resource to internal and external the stakeholder communities. An examination and extrapolation of these data by CIP provides information about emerging disciplines as well as those that are being realigned with other

disciplines or eliminated. The FAEIS system also collects information by institutional structure allowing a better understanding of the alignment disciplines by college or department.

FAEIS data is utilized by faculty in applying for education and other related grants from CSREES. The grant applicant community referred this resource to evaluate the evolving needs and trends in education for food and agricultural sciences. It is also used to assess and plan educational programs in the food and agriculture sciences. CSREES personnel utilize data from FAEIS to answer questions from various internal and external including Congress and the White House on enrollment and graduation trends and placement of graduates. FAEIS along with data from the Department of Education (specifically the National Center for Education Statistics (NCES) which collects information annually from U.S. institutions) have been used to support other activities and portfolio assessments within CSREES.

Resource #6: Survey of Earned Doctorates (SED)

The Survey of Earned Doctorates is produced by the National Science Foundation (NSF) to gathered data on the number and characteristics of individuals receiving research doctoral degrees from all accredited U.S. institutions. USDA has participated with NSF as a co-sponsor on this project since 1986. The results of this annual survey are used to assess characteristics and trends in doctorate education and degrees. This information is vital for educational and labor force planners within the Federal government and in academia and is utilized regularly to respond to internal and external requests. The data collected through the SED are comprehensive and incorporate a variety of topics including: previous degrees awarded, family background, student indebtedness, time to degree, citizenship and employment plans upon completion of the degree to name just a few. General longitudinal compilations of key variables are reported for a ten year period. A summary of the trends and discussion of relevant topics are also provided in the report.

Data from FAEIS, NCES and SED for the fields relating to food, agriculture, natural resources and family and consumer sciences are found in Tables 7-12 in Appendix - Section II.

Resource #7: Employment Opportunities for College Graduates in the Food and Agricultural System

The Employment Outlook publication is an analysis of projections of employment opportunities using data from the Bureau of Labor Statistics and the graduates from degree programs in the fields of agriculture, natural resources and veterinary medicine and related fields in the U.S. The study is conducted through a cooperative agreement with Purdue University. Funding for the 2005-2010 report produced a printed version of the full brochure and two summary documents one in English and another in Spanish. These documents are available through Purdue University as well as on several web sites.

The brochures have been utilized by not only post-secondary institutions for recruitment of students and career opportunities for graduates, but also by secondary teachers and advisors at 2-year community colleges across the U.S. Over 25,000 copies of the full brochure have been distributed.

Resource #8: National Food and Agricultural Sciences Teaching Awards Program (TAP)

The National Food and Agricultural Sciences Teaching Awards Program (TAP) to recognize and promote excellence in teaching food and agricultural sciences throughout U.S. colleges and

universities. TAP is USDA's primary public recognition program to promote and recognize teaching excellence. Since TAP's inception, 130 regional, and 34 national recipients have been recognized for outstanding service to teaching. Goals of the TAP program are:

- Annually recognize and honor a select group of college and university teachers who excel at teaching,
- Demonstrate a positive impact on student learning through improved, innovative teaching practices, and
- Increase the number and diversity of academic programs participating in the TAP.

Resource #9: Stakeholders

Stakeholders are any individual, institution or organization which has a vested interest in the funding, awarding, management, implementation and outcomes of a particular grant program. The primary stakeholders are students, faculty, administrators, and Congress. Other stakeholders include communities, businesses, and the American public. Stakeholder input is both formal and informal. Stakeholders are encouraged to respond directly to CSREES' RFAs or indirectly to NPLs. CSREES often holds stakeholder meetings as a tool to obtain more informed feedback. NPLs take seriously feedback that is received and it helps to inform the development of RFAs.

Target Area Program Synthesis

Below Table 5 is a pictorial summary of how the 12 primary programs address the six target areas. The chart indicates the areas of primary focus by each program of projects awarded during the period of the review. It is critical to understand that awards frequently cross multiple target areas.

Table 5: Key Target Areas by Program

Program	Faculty	Curriculum	Students	Facilities	Methodology	Collaboration
AITC	x	x		x		
ANNH		x	x		x	
HEC		x				
H S I		x	x		x	
RIIA					x	
ISE					x	x
MSP			x			
NNF			x			
SPEC		x				
1890 CBG		x	x		x	x
1994 Equity		x	x		x	
1994 Endowment		x		x		
TOTAL	1	8	6	2	6	2

In Table13 in Appendix - Section II the program leaders have identified how their program and awards during the review period focus on the six target areas. Though the primary focus is identified, the awards for the most part do touch upon more than one target area as is seen in the various reviews presented and referenced in the appendices.

Conclusions

The central assumption is that our nation’s competitiveness in the food and agricultural sciences is improved by focusing education grant resources on the six target areas which strengthen the educational capacity at collaborating institutions, especially those that serve minorities. There is ample data to support the fact that SERD resources enhance the 12 grant programs. It is also clear that the grant programs focus on addressing needs within the six target areas. What is less clear, and more difficult to discern, is the data to measure whether improvements in the six target areas actually accomplish the goal of strengthening education in the food and agricultural sciences. Baseline data is largely missing and reporting of specific outcomes is weak, although most programs have integrated an assessment component into their RFAs. The indicators that would make this connection have yet to be delineated and asked for of our grant awardees. There is ample anecdotal evidence that CSREES’ education programs are supporting the theme, but because of the lack of performance indicators, a rigorous analysis is yet to be achieved. Additionally, significant outcomes of projects may only occur well after the grant has been “officially” closed.

National needs are changing and evolving and workforce demands are undergoing a similar shift in emphasis. New developments in technology, global shifts in climate change, and profound changes in rural and urban economic opportunities are requiring a new kind of graduate. In addition, the definition of “agriculture” has changed over the last 30 years and significantly in the last 10 years. Students today are more interested in degree programs that support bio-energy, biotechnology, environmental sciences and nutrition than the “traditional” agricultural degree programs such as agronomy, animal sciences, and soil sciences. This is reflected on college

campuses with declining enrollment in the “traditional” agricultural science degree programs and even “traditional” students (18-22 year olds) leading to an aggregation of curricula into new agricultural degree areas such as environmental science, land use planning and management, urban forestry, as well as family and consumer/human sciences. In addition to a change in emphasis, course delivery is also changing. Changes in technology now make it possible for students in remote locations have access to information and courses. The notion of the “traditional” classroom is expanding far beyond the “traditional” college campus, engaging new innovations in teaching and learning.

The opportunity in all of this is that there will be a growing demand for graduates with a wide array of new degrees and experiences. Shifts in our climate, natural resource base, energy use and community economic health will require a graduate that is more capable of handling a wider variety of applied problem and more geared to sustainable approaches towards bio-energy, organic and specialty crop production. The next generation of agriculturalists will be more in demand but less identifiable by traditional degree programs.

Since CSREES grant programs are inherently broad and flexible, the legislation allows for RFAs to change in response to emerging national needs and trends. Support for institutional educational capacity should anticipate and meet demands of programs tailored to emerging needs. This change is seen in the FAEIS data which in addition to numerical data contains the changing nature and composition of schools, colleges and departments of agriculture. New and emerging programs are added and mergers occur, changing the look of agricultural education. What once was clear-cut is now very nebulous and includes a wide variety of disciplines. This also leads to multidisciplinary majors providing students with a wide variety of courses from which to choose. Additionally, faculties need to be up-to-date in their own fields as well as peripheral fields in which agriculture is integrated.

Because of the nature of the reporting system at CSREES and the projects which cross the six target areas, it is difficult to identify with accuracy the amount of funding distributed by target area. From the schematic diagram, Table 5 on page 45 it appears that faculty development receives the least amount of support. It is assumed that the remaining five categories are dependent upon a highly trained and experienced faculty who incorporate research and outreach into their curriculum and who possess the teaching skills to stimulate and cause students to enter into and graduate from degree programs in the food and agricultural sciences. The areas that receive the most attention - curriculum development, student experiential learning and student recruitment, retention and graduation have program depth and breadth. Could we improve the five target areas by focusing more on faculty development and teacher training?

Broad Challenges to be Addressed:

- Is the theme of strengthening institutions’ education programs in food and agricultural science being optimally attained through the six target areas by the 12 grant programs and nine resource areas? Is this framework fully effective? If not, how should it be revised?
- Is optimal use of the existing educational resources being made? If not, where should CSREES adjust?
- Is the current division of responsibilities and priorities of educational programs in agricultural and food science across federal agencies as effective as it should be? If not, where should resources be made?

- What should be the overarching priorities of CSREES education programs and what proportion of resources (i.e., grant funds) should be allocated to them? Should targeted areas currently receiving less attention be elevated in the RFA?
- Are graduating students meeting employer needs in the areas of food and agricultural sciences?
- Is the definition of education, as set forth in the legislation, adequate, should it be changed? If so, what to?
- Is CSREES educational mission best served through gathering educational programs into one unit or diffusing them throughout other units.

Conclusions and assessments based on this section as well as the following section on secondary programs will be presented in Section V along with a scorecard which was discussed by the portfolio review writing team and members of planning and accountability staff.

Section III: Secondary Education Portfolio Programs

Section Introduction

The term Secondary Education Portfolio programs refers to the programs that do not have an authority with specific focus on education for workforce development, but do make a significant contribution to education through, for example, the development of course materials, providing enhanced teaching and research infrastructure for student learning, or involving students in experiential learning. These activities are supported through a wide variety of funding mechanisms including formula funds (e.g., Hatch, Evans-Allen) and competitive grant programs. As described in Section II, the legislative authorities for some of those programs are detailed in Table 14 Appendix - Section III. The programs include some managed by SERD and some by other CSREES units, according to Table 6 below.

Table 6: Secondary Programs by Unit and Target Area

Unit	Program or Project	Target Area(s)
SERD	1890 Capacity Building Research Grants Program	4,5
SERD	1890 Facilities Grant Program	4
SERD	Tribal Colleges Research Grants Program	2,3,5
SERD	Federally-Recognized Tribes Extension Program	1,3,5
SERD	Tribal Colleges Extension Program	4,5
PAS-Animal	The Dairy Center (Other Grants)	4,5
PAS-Animal	Virtual Dairy Cattle Encyclopedia of Reproduction (IFAFS)	5
PAS-Engr.	Biobased Products Multistate Committee S-1007 (Hatch)	5
PAS-Plants	UMES Ag Experiment Station (Evans-Allen)	5
NRE	Tools for Integrated Watershed Management	2,5
NRE	ADAP Capacity-Building Project	1,3,5
NRE	ADAP Paraveterinary Training	2,5
NRE	Renewable Resources Extension	2,5
ECS	Great Plains Interactive Distance Education Alliance	2,5
Cross-units	Section 406 Integrated Programs	5

Science and Education Resources Development (SERD)

SERD manages a broad portfolio of competitively awarded higher education programs with institutions in the food and agricultural sciences; competitively awarded research, extension, and academic programs for minority-serving institutions; formula-funded research and extension funds for the 1890 land-grant universities; Federal facilities grants for the 1890 and 1994 land-grant universities; funds that allow 1862 land-grant universities to support extension and outreach on Indian reservations; a broad range of international programs and projects that leverage the research, education, and cooperative extension expertise of U.S. universities; and the Agriculture in the Classroom Program. In addition, SERD manages the Food and Agricultural Education Information System (FAEIS).

Many SERD programs are described in Section II, but the following four programs do not have an authority with specific focus on education for workforce development, but do make a significant contribution to education: 1890 Facilities Grant Program, 1890 Capacity Building

Research Grants, Tribal Research Competitive Grants Program, Federally-Recognized Tribal Extension Program, and Tribal College Extension Program. See Table 15 Appendix - Section III for more detail on the SERD programs described briefly here.

1890 Facilities Grant Program

The Facilities Grant program is used for the acquisition and improvement of agricultural and food sciences facilities and equipment, so that the 1890 institutions may participate fully in the production of human capital in the food and agricultural sciences. The Facilities Grant Program enhanced the effectiveness at the 1890 land grant institutions in research, extension and education, for example:

- New cutting edge research technology has responded to customer needs.
- Experiential learning opportunities have been improved.
- New degree programs:
 - Ph.D. (Plant & Soil Science Program) – Alabama A&M University
 - Ph.D. (Food Science Program) – University of MD - Eastern Shore
- More than 1,000 new students have matriculated in the Food and Agricultural Sciences
- Recruited faculty with expertise to enhance programs
- Constructed new/renovated research office complexes, extension office
- Conference centers and combined research and extension office centers
- Cutting edge research technology applied to customer issues
- State-of-the art teaching and learning environments
- Leveraging new dollars from state and private sector
- New regional, national and international collaborative efforts and partnerships
- Financial management for rural underserved communities

1890 Capacity Building Research Grants Program

In addition to building the academic programs, the 1890 Capacity Building Grants Program (CBG) is also intended to strengthen research programs in the food and agricultural sciences by building the institutional research infrastructure in the area of Food and Agricultural Sciences of the 1890 Land-Grant Institutions, Tuskegee University and West Virginia State University through cooperative linkages with Federal, non-Federal entities, and Industry. The CBG program supports projects that strengthen research programs in the targeted research need areas of studies and experimentation in food and agricultural sciences, centralized research support systems, technology delivery systems, and other creative applications. As related to research, the program is designed to achieve two major goals:

- To strengthen linkages among the 1890 institutions, other colleges and universities, USDA, and private industry; and
- To enhance the quality of teaching and research programs at the 1890 institutions to more readily establish them as full partners in the U.S. food and agricultural sciences higher education system.

The program provided experiential learning to undergraduate students as well as provided the training opportunity to graduate students and postdoctoral fellows. The program also provided

the 1890s with opportunity for developing research centers that incorporated their education goals. The program highly encourages the participation of students and the use of research as an effective tool to strengthen the learning experience of undergraduate and graduate students. The program funded wide area in food and agriculture sciences with emphasis on the priority areas identified by the USDA. Because of the research focus of the program, no significant educational data were collected comparing to the teaching component of the program. In addition, separation between research and teaching in the 1890s has contributed to lack of educational data collected for the research component of the program.

To enhance the efficiency of the program and its impact and outcomes, matrices should be identified and used to document the impact and outcomes of the program as related to education. Furthermore, close collaborations and narrowing the separation of between teaching and research should be encouraged. Examples of the 1890 Research Capacity building contributions to the Education Portfolio include:

Comparative Genetic Mapping of Peanut and Soybean, Tuskegee University. The research project had a primary focus on the transferability of soybean SSR markers in peanut. The transferable markers from soybean not only provide genetic and genomic tools for peanut research, but also offer a set of common markers for comparative genetic mapping between peanut and soybean, two economically important legume species. To date, 199 out of 868 soybean SSR primers were identified to be amplifiable in peanut and further were tested for polymorphism among parental DNAs for comparative genetic mapping.

The transferable molecular markers among related species would shed the light on the mechanism of genome evolution among these species using comparative mapping. Several undergraduate students were trained in Molecular Biology and genetics of soybean and peanut

Developing and Testing a Best Practice Model for Global Agricultural Studies Programs (GASP) in HBCU's, North Carolina A&T State University. Participation in global education programs is low and there are deficiencies in gathering and managing data for decision-making in global education programs. This funded project developed a set of best practices and retool curricula to equip faculty and students with the skills needed to function smartly around the world in order to strengthen America's leadership in international agriculture. As outcome, a 30% improvement in international content in curricula in agricultural courses; a reported increase of 40% in participation in study abroad programs among students enrolled in schools of agriculture in 1890 institutions; a 40% increase in awareness of and interest in international agricultural issues among faculty and students in schools of agriculture in 1890 institutions. In the long run the project will produce students and faculty capable of working with their counterparts in a transnational context to solve complex global agricultural problems.

Economic Development in Rural Mississippi: Changes in Labor Market Opportunities and Capacity Building through Education and Healthcare, Alcorn State University. Even as the project has completed only its first year and has generated primarily preliminary data, impact has been felt in various arenas at Alcorn and out in the respective communities. Local community officials and support organizations are developing a better understanding of their local labor market and available opportunities in selected areas. They are becoming more aware of how investments in human capital, especially in the form of health and formal education, are related to social and economic development. Some policy makers have been communicating with project directors in seeking advice as to how to devise innovative intervention programs with

sufficient flexibility to respond to the changes and the needs of specific communities and people. Preliminary results have supported previous findings that training in education, health and healthcare, are major issues in Mississippi and as the project progresses programs will be forged to pay careful attention to increasing the capacity of rural communities in order to effectively address these issues. During the summer 2007, our student interns and some project directors worked in various communities to help residents improve their knowledge of budgeting, business management, basic healthcare matters, and other important life skills. This effort will no doubt go a far way in helping to improve various aspects of peoples' economic and social conditions. Through its interdisciplinary focus, this project has so far improved the knowledge of students, as well as the expertise of faculty and staff at Alcorn State University who are particularly interested in rural development

Tribal Colleges Research Grants Program

Tribal Colleges Research Grants Program (TCRGP) is a competitive grants program for the 1994 Land Grant Institutions to support fundamental and/or applied agricultural research projects that address high priority concerns of tribal, national or multi-state significance. Examples of TCRGP contributions to the Education Portfolio include:

Structure and Function of Microbial Communities in Mine Impacted and Non-Impacted Environments, Fort Belknap College (FBC), provided an assessment of the impacts of mining activities on soil microbes at the Zortman-Landusky Mine (ZLM) site. Project staff trained fifteen undergraduate interns to perform various scientific tasks associated with the research (soil sampling and analysis, water analysis, geographic information systems, data collection and analysis.) Three students trained in a number of more advanced cutting edge soils research methodologies, and an undergraduate research quality laboratory and water quality curriculum were also developed and implemented.

A Pilot Aquaculture Partnership Project to Enhance Tribal Community College Instruction, Research Extension, and Entrepreneurial, Fort Berthold Community College (FBCC) students gained quality experience in the process of conducting research. Grades 6-12 students, FBCC students, and members of the three affiliated tribes learned of the potential educational, nutritional, and economic benefits an aquaculture project could offer to Fort Berthold. FBCC faculty gained valuable experience in the process of collaborating and cooperating with Federal and State entities, agencies, and representatives

Leafy Spurge and Selenium Research at Sitting Bull College. Sitting Bull College's contribution to student experiential learning was a project focused on Leafy spurge (*Euphorbia esula*), a noxious weed that is rapidly spreading on the Standing Rock Sioux Reservation. Eight high school students and four Sitting Bull College students were given summer jobs, where unemployment is about 70 percent in the winter and 30 percent during the summer. All the students learned to identify many of the native plant species and to gather data including the use of GPS, GIS and remote sensing.

Federally-Recognized Tribes Extension Program

The Federally-Recognized Tribes Extension Program supports extension education on Indian reservations and tribal jurisdictions to address the unique needs and problems of American Indian tribal nations.

For example, the Montana State University – Fort Belknap Reservation project conducts agricultural finance management and broad-based management training for producers. The project has implemented practices for improved culling, retaining replacement heifers, shorter calving intervals, and improved feeding methods. Between April 2007 and March 2008, more than \$300,000 in expansion loans was approved through agricultural lenders. Nearly 1,100 calves were sold through the livestock coop weighing facility, saving more than \$25,000 for 13 producers. Twenty infestations of leafy spurge and spotted knapweed were controlled by six producers. Two producers increased alfalfa hay production by planting and renovating 180 acres of hay, and two individuals received private pesticide applicator licenses. Horticultural training and demonstration garden tours were held for more than 100 persons, resulting in more than 25 gardens being planted. Camps, winter fair and conservation days were organized for more than 250 youth who gained positive life and leaderships skills, respect for others and a keen sense of regard for the environment. Five youths between the ages of 9 and 18 and their parents were trained to establish livestock herds valued at more than \$28,000. These youth and their parents learned hands-on beef and finance management practices.

Tribal Colleges Extension Program

The Tribal Colleges Extension Program provides funding to 1994 Land-Grant Institutions to conduct Extension education programs and activities. Culturally appropriate curricula, teaching methodologies, technology and materials, which enhance the delivery of extension programs in Native American communities, have been and continue to be developed and utilized by the 1994's.

For example, the College of the Menominee Nation (CMN) is working to strengthen the sustainable economic development potential of the Menominee, Stockbridge-Munsee, Oneida, and Potawatomi Reservations and surrounding communities through needs-based training that promotes and encourages public and professional growth and stakeholder involvement in the process. Between September 2006 and August 2007, parents, community members, Tribal Daycare personnel and Tribal Head Start personnel (159 participants) attended Early Childhood training sessions recognized by the Wisconsin Registry as continuing education hours required for all licensed child-care providers. Five hundred sixteen participants attended 55 Job-Based training sessions with topics that included case management, developing high performance teams, financial literacy and job searching/job preparation. Red Cross first aid and CPR courses (108 participants) were provided to local professionals, educators and law enforcement personnel, providing required certification.

Plant and Animal Systems (PAS)

Within CSREES, the Plant and Animal Systems (PAS) team promotes production and protection systems that are efficient, economically competitive, environmentally sound, and socially acceptable through research, education, and extension programs. The PAS vision is to be the respected national entity that advances high-quality, innovative, and relevant agricultural research, extension, and education programs through partnerships with public and private

organizations and agency counterparts. PAS works primarily in the areas of animal production and protection, plant production and protection, and processing, engineering and technology.

Tracking the fiscal contribution of PAS to the Education Portfolio is not straightforward due to the numerous types of funding mechanisms and the reporting requirements and systems used. Formula funding and special grants are a large part of the responsibilities of the PAS team; however, education investment is not tracked consistently or specifically through these mechanisms. Tracking investment in education through PAS-administered competitive programs is relatively straightforward due to the fact that these investments are recorded. For example, the education investment reported in plant-related integrated activities for which PAS is responsible (i.e., CAR, RAMP, Methyl Bromide Transition, PMAP, Integrated Organic Program and IPM Centers) for the years 2000 through 2007 was \$9,351,169.

Several noteworthy examples of activities supported by PAS, through various funding mechanisms, with an education focus are described below.

- The Northeast Iowa Community-Based Dairy Foundation owns and operates The Dairy Center, an educational facility which includes two dairy farms (one a conventional freestall set up and the other a grazing farm). Through a partnership with Northeast Iowa Community College and Iowa State University, Northeast Iowa Community College Dairy Science students learn hands-on by working and having lab classes on farms, and in classrooms. Students have the option of attending Iowa State to earn a four-year degree after completing the two-year program.
- The Virtual Dairy Cattle Encyclopedia of Reproduction is a web-based teaching tool developed by Michigan State University, which is designed to provide information on the fundamentals of dairy cattle reproduction, new technologies and the importance of reproduction to dairy farm profitability. It serves as a teaching tool for students, dairy producers, farm employees and veterinarians. The pictures, charts and diagrams utilized are designed to illustrate real-life examples. The quizzes accompanying each section are designed to test knowledge of the concepts covered in each section.
- During the past five years, through the multi-state committee project S-1007, universities have developed curricula to educate new scientists and engineers to respond to needs for biobased products and to reduce national dependence on imported petroleum. Educational modules were developed and outside-the-classroom opportunities were provided to better prepare students for employment in biomass conversion industries. The University of Nebraska developed a joint undergraduate/graduate course, Computations in Biological Systems, that was successfully presented in spring 2004. The University of Tennessee developed a peer-reviewed, web-based database "BioWeb" to organize and deliver information on a full range of producing, pre-processing, pre-treating and conversion of biological materials into fuels and products. The University of Tennessee, North Carolina State University and North Carolina A & T are developing and testing distance learning curriculum that includes six graduate and programs. The project also has provided an avenue for effective collaborations and communication on bioprocessing and biobased products, where members have established grassroots efforts to seek funding from Federal, state and other sources.

The main objectives of work at the University of Maryland Eastern Shore Agricultural Experiment Station (UMES) are: 1) to design and develop a university trial garden at the UMES Agricultural Experiment Station, 2) to train undergraduate and graduate students on research and plant evaluation protocols, and 3) to make the data obtained from the trials readily available to landscape professionals, greenhouse growers, retailers, and consumers through education and outreach activities.

Natural Resources and Environment (NRE)

CSREES' Natural Resources and Environment (NRE) Unit programs and activities strengthen the nation's capacity to address critical environmental priorities. At the same, they help people better understand the value of their natural resources. NRE national leadership in environmental science promotes research that leads to sustainable use and best management practices. Working in partnership with land-grant universities, the NRE unit seeks innovative research-based technologies that provide environmental and economic benefits. The public learns about these new developments through hands-on educational programs at the local level.

NRE contributions to the Education Portfolio include: (see Table 16 Appendix - Section III for more detail):

- Tools for Integrated Watershed Management: with four years of CSREES funding, the regional project “Coordinated Agricultural Water Quality Programming for the Northern Plains and Mountain Region,” with Colorado State, Utah State, and Montana State Universities and others, developed curricula for 9th-grade high school (Stream Side Science) and three on-line graduate courses. Over 12,000 youth and 1,500 teachers have learned from the project, and Utah’s Governor Olene Walker officially endorsed the Stream Side curriculum for her statewide Watershed Initiative.
- The Agricultural Development in the American Pacific (ADAP) project encourages promising individuals to “catch the Land Grant bug” early in their academic lives to make serving Pacific Island communities a career choice, by providing local residents with funded educational advancement. Dozens of individuals have benefited, and many have returned to enhance programs at the non-Hawaii Pacific Land Grant Institutions and/or become national leaders.
- The ADAP project “Paraveterinary Education and Training for the Pacific Islands” established a cross-Pacific team of veterinarians, animal handlers, and curriculum writers to write and design one of the most comprehensive Pacific-based animal health curricula to date. The purpose of the project was to establish a self-sustaining, Pacific-relevant distance learning program on the basics of veterinary medicine and animal husbandry, and to work with national and international partners to educate a select cadre of paraveterinarians in all 24 Pacific Island nations.
- Sixty-nine land-grant universities provide educational programs to private forestland and rangeland owners across the nation with the support of Renewable Resources Extension Act (RREA) in 2007. While much of the activities under the guidance of RREA relates to landowner or informal education, our university partners are accomplishing several formal activities for K-College education and continuing professional education, including 9,000 primary school students in Arkansas, 150

students and advisers in Delaware, over 1,600 teachers in Oregon, and many hundreds of other students and professionals across the country (see Table 16 Appendix - Section III).

Economic and Community Systems (ECS)

The programs and activities of the CSREES Economic and Community Systems (ECS) Unit provide national leadership and support for research, extension, and education to increase the prosperity of America's communities, families, and agribusiness firms. Specifically, ECS programs assist in applying the social sciences to the issues and problems of families and consumers, farms and ranches, agricultural and other businesses, and rural communities. Contributions to the Education Portfolio are in two areas: financial planning and sustainable agriculture. (See Table 17 Appendix - Section III for more detail.)

- Through Great Plains IDEA, which launched in 2003, students enroll in one institution and take online courses from eight universities in the alliance. Coursework is offered by Iowa State University, Kansas State University, Montana State University, University of Missouri, University of Nebraska, North Dakota State University, Oklahoma State University, and South Dakota State University. The master's degree includes 14 courses. Six of these cover the 89 competencies established by the CFP Board (insurance, investments, retirement planning, estate planning, personal income taxation, and fundamentals of financial planning); five courses include housing and real estate, professional practices, two practica, and case study/capstone; and three cover family concepts (family systems, family economics, and family financial counseling). Great Plains IDEA has graduated 90 students with master's degrees and 21 students with graduate certificates in Family Financial Planning (FFP)
- Sustainable Agriculture Research and Education (SARE) supports applied research and extension in sustainable agriculture through competitive grants administered by four regions hosted by land-grant universities and steered by regional Administrative Councils. SARE contributes to the Education Portfolio in two ways: through SARE Graduate Student grants (127 awards from 2002-2006), and through involvement of undergraduate and graduate students in SARE Research and Education grants (approximately 75% of 303 awards from 2002-2006). In both cases, students gain experiential knowledge in planning and conducting applied research and extension in sustainable agriculture.

Families, 4-H and Nutrition

In cooperation with the Land-Grant University System and other partners from the public and private sector, CSREES' Families, 4-H, and Nutrition Unit provides national leadership for programs addressing critical issues related to children, youth, and families. Its programs focus on nutrition, health, youth and family development, and housing and indoor environments. The National 4-H Headquarters is located in the Families, 4-H, and Nutrition Unit.

4-H programs, with over a 100 year history, provide positive youth development experiences to diverse populations through a large and complex system. The 4-H program combines the cooperative efforts of almost seven million youth; the National 4-H Headquarters in the Cooperative State Research, Education and Extension Service (CSREES) of the US Department

of Agriculture; volunteer leaders and professional staff; Cooperative Extension Services (CES) at 106 state land-grant universities; state and local governments; private-sector partners; state and local 4-H foundations; and the National 4-H Council. 4-H, the world's largest non-formal educational program, reaches youth through a variety of delivery systems such as community-based 4-H clubs, after-school and out-of-school time programs, 4-H clubs on military bases world-wide, programs targeted to vulnerable populations, and school enrichment programs. For additional information on 4-H and Youth Development contributions, see Table 18 Appendix - Section III.

4-H and Youth Development

There are at least five broad areas in which 4-H and Higher Education Programs are aligned and linked:

- 4-H Curriculum Delivery through Formal In-School Enrichment Programs
In school enrichment programs, Cooperative Extension Staff work with teachers in the public school system to deliver research-based, age-appropriate curriculum to supplement curriculum provided by the school system. Most 4-H curricula are linked to national educational standards and 21st Century Workforce standards.

4-H youth enrolled (numbers rounded) in School Enrichment programs are indicated for the years covered in this Portfolio Review were: 3.8 M (2002); 4.1 M (2003); 3.5 M (2005); no data are available for 2004 and 2006.

- 4-H Curriculum Development and Dissemination In Agricultural and Food Sciences
The National 4-H Program developed seven curriculum related to agriculture and food sciences during the time period covered by this Portfolio Review. Some curriculum was designed to be delivered in settings such as school enrichment and after-school. Other curriculum is more suited for individual learners who are guided by an adult helper along an individualized time line and learning plan. Each curriculum cost approximately \$50,000 to produce for a total investment of approximately \$350,000. Curriculum emphases were: (i) 2001 Down-to-Earth; (ii) Foods; (iii) Science Discovery; (iv) Forestry; (v) Gardening; (vi) Microwave Magic and (vii) Acres of Adventure.
- 4-H Priority On Science, Engineering And Technology (Preparing Young People For The 21st Century Workforce)
Skills in Science, Engineering and Technology (SET) are critical for young people to be able to thrive throughout this century. While SET has been a primary area of learning since the inception of 4-H over 100 years ago, starting in 2006, the National 4-H Headquarters placed a major priority in this area to bring new visibility and resources to this critical area.

4-H's Science, Engineering and Technology (SET) initiative reaches about six million youth annually with hands-on learning experiences that foster exploration, discovery and passion for the sciences while encouraging young minds and filling the pipeline of young leaders proficient in science. National 4-H Headquarters, along with its private partner National 4-H Council, has set the goal of preparing one million new young people to excel in science, engineering and technology by 2013.

- 4-H Prepares Youth For Post-Secondary Education And Inspires Them To Attend College

The Higher Education Unit focuses on programs that support young people in obtaining post high school education. Several programs offered through 4-H focus on career exploration and decision-making. In addition, some research and evaluation studies have found that 4-H members are more likely to have clear career goals and tend to go to college more than the general population of youth.

- Higher education trains youth workers for 4-H and other youth development programs
One other link between 4-H Youth Development and Higher Education is the education and training of youth development professionals. The Great Plains Interactive Distance Education Alliance (Great Plains IDEA), and other institutions of higher learning, offer certificate and degree programs in youth development. They train youth development professionals to work in 4-H and other youth development programs.

Competitive Programs Unit

The CSREES Competitive Programs Unit manages funding opportunities that challenge the nation's top researchers to identify, solve, and put into practice solutions to problems that improve the safety, quality, productivity, and security of our food supply, the well-being of animals, humans, the environment and natural resources, and rural and urban communities.

National Research Initiative Competitive Grant Program (NRI)

The National Research Initiative (NRI) Competitive Grants Program is the largest competitive grants program offered through CSREES. The NRI was established in 1991 to increase the competitiveness of U.S. agriculture; improve human health and well-being through an abundant, safe, and high-quality food supply; and sustain the quality and productivity of the natural resources upon which agriculture depends. Both basic and applied research and integrated research, education, and extension programs are supported by the NRI. Although the NRI did not have a specific authority to support educational programs until 2003, the NRI is successful in fostering the development of future scientists within basic and applied research programs. Therefore, the majority of educational training that is provided by the NRI is graduate student training and experiential learning within individual research projects. The NRI contributed to the preparation of the next generation workforce for agriculture with comprehensive training and education of researchers, practitioners, teachers, and policy makers.

See Table 19 Appendix - Section III for examples of NRI projects contributing to educational outcomes. As well as the educational training support provided to graduate students by the NRI for the period of the portfolio review.

Cross-Unit Programs

Several programs of either competitive grants (e.g., Section 406) or formula funds (e.g., Evans-Allen, Hatch, and Smith-Lever programs) also contribute to agency education goals. For additional detail, see Table 20 Appendix - Section III.

Section 406 Integrated Programs

The expectation has been that the overall approach to solving critical agricultural issues, priorities, or problems will be through an integration of research, education, and extension activities, through any combination thereof. Programs are funded through competition in funding

opportunities that include the National Integrated Water Quality (NIWQ) program, the National Integrated Food Safety Initiative (NIFSI), and the Integrated Pest Management programs which include Crops at Risk (CAR), Risk Avoidance and Mitigation Program (RAMP), the Regional IPM Centers, Methyl Bromide Transitions (MBT), and Organic Transitions. CSREES administers these funding opportunities by determining priorities in U.S. agriculture through Agency stakeholder input processes in consultation with the National Agricultural Research, Extension, Education, and Economics Advisory Board (NAREEEAB).

During the period of this review, approximately \$43 million dollars comprised total awards to states for Section 406 integrated projects. There were 51 Section 406 projects with educational components that ranged from 10 to 34% of the funded projects. The Section 406 educational activities represented approximately \$6.5 million or 15 % of the total funding, for the period of this review.

Evans-Allen Grant Program

Eligible institutions are the 18 historically-black 1890 land-grant universities and Tuskegee. The scope of research conducted under Evans-Allen is very broad. Approximately \$180 million have been distributed from Fiscal Years (FY) 2002 through FY 2006. As a result, the effectiveness of programs at the 1890 land grant institutions in research, extension and education has increased because of the Evans-Allen program. New cutting edge research technology has been applied to respond to the needs of stakeholders, extension outreach services have significantly been enhanced, and experiential learning opportunities have improved as well. Educational outcomes include:

- Establishment of Aquaculture Research and Technology Centers
- Doctoral programs established (Plant and Soil Science and Food Science)

Smith-Lever Act Formula Fund

The Smith-Lever Act provides Federal formula funds to 1862 Land Grant institutions for cooperative extension activities/programs that take research-based food and agricultural sciences information into the community. While Land Grant institutions in insular areas or U.S. territories (e.g. PR, VI, AS, Guam, Micronesia, Northern Marianas, Republics of Palau and Marshall Islands) are required a 50% match, the majority of the 1862s are required a 100% match from non-Federal funds. Approximately \$1,213,433,266 has been distributed from FY 2002 through FY 2006. The effectiveness of extension programs has made tremendous impact because of the Smith-Lever funds. Current programs funded through Smith-Lever Formula Fund include the Expanded Food and Nutrition Education Program (EFNEP), Farm Safety, Integrated Pest Management, Federally-Recognized Tribes Extension Programs (FRTEP), Sustainable Agriculture Research and Education (SARE), and Children Youth and Families at Risk. Educational outcomes include:

- 4-H Youth Development Programs On The Navajo Reservation
- EFNEP nutrition education for low income families in the nation
- Implement and expansion of “Ancestors Choice (AC)” nutrition and family health information campaign

Hatch Act Formula Fund

The Hatch Act provides Federal formula funds to 1862 Land Grant institutions for agricultural research. Similar to the Smith-Lever Act Formula Fund, Land Grant institutions in the insular areas or U.S. territories must match 50% while the majority of 1862s must match 100% from non-Federal funds. Approximately \$640,157,413 has been distributed from FY 2002 through FY 2006. The effectiveness of research programs has made tremendous impact because of the Hatch Act funds. The scope of the agricultural research which may be conducted under the Hatch Act is very broad covering diverse research areas including: soil and water conservation and use; plant and animal production, protection, and health; processing, distribution, safety, marketing, and utilization of food and agricultural products; forestry, including range management and range products; home economics and family life; human nutrition; rural and community development; sustainable agriculture; molecular biology; and biotechnology. Research may be conducted on problems of local, State, regional, or national concern. Educational outcomes include:

- Pre-school Readiness and School Success, and
- Meat Goat Finishing Systems For Appalachian Small Farms

Other Education Outputs and Outcomes

The Plan of Work and Annual Report submitted by states to CSREES, and past portfolio reviews represent an additional source for education activities from CSREES funding. As currently reported, there is difficulty in determining direct attribution of outcomes. However, the funding from CSREES does influence education activities in the states. The reported educational activities are included in this self study for the Education Portfolio to reflect that influence through:

- New or modified curricula,
- Student scholarships and stipends,
- Professional development for faculty members,
- Development of new teaching methods and
- Conduct CSREES Education Program Reviews

Section IV: External Panel Recommendations

The CSREES Education Portfolio Team response to the external panel recommendations is being developed and will be available by August 2009.

Section V: Self Assessment

Introduction

A major challenge in completing this Education Portfolio is that the agency has no consistently-applied definition of ‘education’, as well as no consistently-applied definition of ‘agriculture’, as used within the education setting. Equally challenging is the lack of a universally-accepted definition of what constitutes an ‘education outcome’. Also, because there is no one Agency Strategic Goal that addresses education, the Education Portfolio, by default, cuts across all of the Agency Goals. This often results in educational efforts and impacts being overlooked.

Further, the single KA903 (Communication, Education and Information Delivery) designation, under which the Education Portfolio falls, has served as a catch-all for any educational-type activity or initiative. Due to the current ambiguity, additional Knowledge Areas should be considered to fully describe the breadth and variety of the education mission of the agency and the Department.

Unlike the Agency’s funded research projects, since the inception of educational programs in the department and before 2003, there had been no mechanism to capture the results of funded projects under a single database. Nor is it easy to determine the exact dollar amount expended on education from external grants, or to identify the percentage of grant funds allocated to the six target areas. These are the basic challenges.

Self-Assessment and Comments

In an effort to bring together various members of CSREES who participated in developing this Education Portfolio and who ultimately contribute to education through awarding grants, an assessment session was held on August 21, 2008. The self-assessment was based on the scorecard CSREES has developed for its portfolios based on the standard OMB Research and Development Evaluation Criteria of *relevance, quality, and performance*.

On the whole, NPLs feel very strongly that their programs are building institutional capacity and preparing students to enter the workforce. The primary programs of the Educational Portfolio are focused specifically on the six target areas. The funding, staff resources, and legislation are providing adequate flexibility for building educational capacity. The challenge is to develop indicators for measuring success and to ensure our institutional capacity building potential is realized given current authorization and resource levels. While the portfolio is achieving good results, the comments below indicate changes can be made to do better.

Comments from that session are summarized directly below. They do not reflect an assessment of this written document. Rather, the comments represent a synthesis of key points that reflect how those within SERD, Competitive Programs and Economic and Community Systems go about trying to accomplish education projects as they conduct the Agency’s business.

SECTION 1 – RELEVANCE

1.1 Scope

Comments – Significant gaps:

- No overall mandate guides the Agency’s Education efforts (other than the individual scope of each grant program) – no unified direction guides what we should be doing in education;
- Not enough attention to non-higher education aspects of the portfolio;

- Lack of a definition for education constrains how we are to appropriately judge the scope;
- Because Education supports (and is the foundation for) all goals within the Agency's Strategic Plan, can it adequately focus on any one?

1.2 Focus

Comments:

- Focus is constrained by what legal authorities permit, and by available funds;
- Concern whether grant programs legislated years ago reflect current needs of the education stakeholders;
- We need to assess where enrollment/degrees awarded/employment needs and emerging opportunities are;
- All Agency units appear to have their own (or no) focus on education.

1.3 Contemporary and/or Emerging Issues

Comments: –

- Contemporary and critical issues according to whom? Legislators have critical issues, as do academic institutions we serve, as well as employers of graduates; whose issues do we serve?
- Project Director workshops have periodically been held to assess faculty issues in improving education. Grant RFAs are modified to reflect these inputs, when permitted by the original grant program legislation;
- No one single discipline is supported in the Education Portfolio. Therefore, each discipline has its own critical issues. Most education grant programs try to address issues critical to education in general (recruitment/retention or instructional delivery, for example).

1.4 Solicitation and/or Receptiveness for Stakeholder Input

Comments: –

- Other portfolios, because they are aligned with a single (or closely related) academic discipline, can call a single stakeholder meeting for input; How does Education do this for all the food and agricultural sciences disciplines?
- We have been responsive to the feedback from other agencies and academic areas, however, it is hard to hold a single meeting to get input;
- Stakeholder input processes and levels of participation by the stakeholders is not well documented in our current system.

1.5 Utilization of Stakeholder Input

Comments: –

Utilization of Stakeholder Input

- More explicit formal routes of stakeholder input are needed to collect input to address general education issues (not just specific, discipline-related input);
- Where national meetings do exist to collect stakeholder input, SERD leadership has previously attended these meetings/conferences (ACOP, AASCARR, etc.), not the NPL who manages the specific grant programs. Often a disconnect exists in conveying to the NPL what was discussed at the national meeting;
- NPLs should have a close association with NASULGC committees on education, and with other, related academic organizations, to address this disconnect;

SECTION 2 – QUALITY

2.1 Significance of Results

Comments: –

- We need to better educate grant recipients how to construct and report more descriptive project outcomes;
- A mechanism (CRIS format and trained support staff to interact with grantees) to collect outcome information is not in place;
- Only a few programs (i.e., HSI) have had sufficiently well-trained staff to call and solicit this critical information from grantees;
- We all have anecdotal stories we could relate – but we have not consistently and uniformly formalized the collection of these data;
- Not every grants program has the staff to effectively monitor post-award activities. Training for reporting has not been at the same level for all programs, and what is evident is based on individual program leaders;
- Our funding is having a significant impact, as we attend and hear first-hand reports from on-site visits and at meetings, but not all of this information has been collected in our CRIS final performance reports;

2.2 Usefulness and Utilization of Results

Comments: –

- We hear great success stories from the Project Directors, but not all of this information has been routinely collected in our CRIS reports. What results are collected are not adequately discussed among NPLs to improve future efforts.
- Education projects do contribute to the mission of the agency;
- Overall – We are beginning to transition from reporting outputs to outcomes and are transitioning to collecting data needed with new systems;

2.3 Integration

Comments: –

- Some Agency programs are legislated to accomplish integration – but education grant programs do not contain this same legislative authority;
- HSI and Challenge grant programs do report experiential learning as one way students enhance their ability to obtain jobs;

2.4 Interdisciplinary Balance

Comments: –

- Portfolio - Very interdisciplinary; Most education related RFAs encourage interdisciplinary aspects.

2.5 Alignment with Current State of Knowledge and Science and Use of Appropriate and/or Cutting Edge Methodology

Comments: –

- Portfolio supports new modes of learning: delivery and pedagogy;
- Distance Education – exciting and cutting edge;
- Learner-centered teaching methods;

SECTION 3 – PERFORMANCE

Program Performance

3.1 Productivity

Comments: –

- Productivity has been limited by administrative barriers (i.e., personnel turnover and positions not filled);
- Only recently have tools been put into place to monitor funding drawn down activity (we often need to remind grantees to draw-down funds, especially Tribal and high school programs);
- Overall: Program Management has begun to respond to productivity and management oversight issues highlighted during the recent audit of tribal colleges.

3.2 Comprehensiveness of Work Produced

Comments:

- Human Capital development is a primary function of several education grant programs, and a closely-related focus of all education efforts.

3.3 Accountability

Comments: –

- It is a difficult situation to address. Financial accountability, for example, exhibits great variability depending whether the institution has a seasoned, active Sponsored Programs Office (in which case funds are drawn down on time) and those who do not (high schools, and some community and Tribal colleges) in which case there is not a rigorous process to ensure finances are constantly reviewed;
- Carry-over funds must be accounted for and stated in some way to address the management of funded project;
- Insufficient staff resources to adequately perform post-award management. NIH agencies have rigorous follow-up; Our agency has not historically had that level of post-award management (at least in the Education Portfolio area);
- Some of our recipient institutions have small staff and have high turn-over; no consistent follow up to financial and program reporting issues.

Agency Performance

3.4 Program Leadership, Partnership, and Guidance

Comments: –

- Leadership – At agency level: not visible for Education Portfolio;
- Partnerships – 1890/HSI: are required to partner with Federal agencies;

3.5 Program Management

Comments: –

- We are moving towards improved program management;
- Documentation of results – “One Solution” will allow addition of outcomes after the grant award period is closed:
 - Results can be added
 - Impacts will be easier to collect
- Processing/Appropriate Use of Funds/Awarding: All Done well;
- Improvements in CRIS, NPL Dashboard and program management;
- CREEMS is enhancing programmatic management.

Target Area Summary

Throughout this document, six key target areas have been used to categorize the Education Portfolio effort. The following provides an overall summary of those key Target Areas:

Faculty training and development

This key Target Area prepares faculty to address an emerging student clientele (demographic composition and learning styles) and to improve teaching competency (subject matter expertise and pedagogy). Faculty may use project funds to attend professional development workshops or conferences to acquire new teaching skills as well as to increase their knowledge about domestic and international career opportunities, and increasing their understanding of underrepresented populations and cultures.

Projects in this area encourage teachers to help students attain their career goals and to better address workplace needs. Activities may include helping faculty gain experience with recent developments or innovative technology relevant to their teaching responsibilities; work under the guidance and direction of experts who have substantial expertise in an area related to project goals; work with scientists or professionals in government, industry, or other colleges or universities to learn new applications in a field; expand competence with new methods of information delivery; or increase understanding of the special needs of non-traditional students or students from groups that are underrepresented in the food and agricultural sciences workforce.

Curriculum and new program development

This key Target Area promotes developing new, or adapting existing, curricula and related materials to meet changes anticipated within the domestic or international food and agricultural sciences system. Funded projects may update classroom content or result in establishing new academic majors or concentrations. Innovation is a core, guiding principle. Projects in this area span activities from the nation's high schools and community colleges through postgraduate studies.

In general, the RFAs for these grant programs encourage academic institutions to respond to emerging local, regional or national needs within all the broad areas of the food and agricultural sciences. Innovative teaching practices encourage faculty to deliver coursework through a variety of methods to address not only the needs of at-risk students, but also for the increasingly prevalent non-traditional students who often may not be physically present in a traditional classroom. Many applicants depend upon these funding sources as their only source of extramural support to update or to introduce new coursework. Projects update disciplinary content; develop students' analytical, interpersonal, leadership, communications, problem-solving, computational, and decision-making skills and abilities. They also encourage movement away from fragmented, discipline-specific, lecture-oriented instruction and toward integrated, multidisciplinary, learner-centered instruction.

|

Recruit, retain, train and graduate students prepared to enter the workforce

This key Target Area seeks to increase the number of graduates with a baccalaureate (or higher) degree in the food and agricultural sciences, through the development of new and innovative counseling, marketing, career information, and other projects that:

- increase student enrollment in disciplines with documented, critical workforce shortages,
- target non-traditional students and students from groups that are underrepresented in the food and agricultural sciences workforce, or
- support the development of new student retention programs focusing on the academic, social, or cultural needs of freshmen, transfer, or other at-risk students.

Project funds may be used to hire peer counselors or mentors assisting with these recruitment/retention activities.

Especially through the Multicultural Scholars and National Needs Graduate Fellowships programs, students are provided funds to support undergraduate- and graduate-level training in areas of targeted expertise shortage areas. The awards also address attaining workforce competency through support for special experiential learning opportunities; addressing the rising cost of higher education, and providing access to beneficiaries from diverse groups who may not participate in higher education for the national Science, Technology, Engineering and Mathematics (STEM) initiative within the domain of food and agricultural sciences.

Instructional materials, equipment and facilities

Projects in this key Target Area provide students and faculty in science-oriented courses with contemporary educational supplies and materials, as well as suitable, up-to-date equipment, to foster an awareness of common knowledge and workforce practices expected of graduates. Funded projects focus both on updating classroom content and acquiring corresponding scientific equipment or supplies needed to address new occupational competencies.

Teaching methodology including experiential learning

Projects addressing this key Target Area encourage the development and use of alternative methods of delivering instruction that enhances the quality, effectiveness, and cost efficiency of teaching programs. Multi-institutional, regional, national or international collaborations are encouraged. Examples may include interstate approaches to curriculum development, faculty sharing, cross enrollments, joint degrees, regionalization of academic programs, regional and national workshops and symposia, and similar methodologies. Approaches may include experiences where students are placed in team-oriented, problem-solving, decision-making situations in the context of real-world situations. Experiential learning in laboratory research or field-based internships is also encouraged.

Collaborative and integrated programs

Collaboration with other academic institutions, as well as with employers of the program's graduates, is strongly encouraged in all Education Portfolio projects. Funding amounts are often increased for projects that involve multiple institutions and diverse partnerships that can demonstrate more efficient delivery of coordinated, academic instruction. A core objective in

these projects is to reduce instructional duplication and costs. Because many applicants work in small academic units, often as the only agricultural sciences faculty on staff, projects that form partnerships with other academic institutions, as well as with employers of the program's graduates, are strongly encouraged. The International Science and Education competitive grants program especially addresses this Key Area by awarding grants for programs that support international collaborative research, extension, and teaching activities that focus on enhancing the international content of curricula with the goal of producing globally competent professionals.

Conclusion

In summary, upon completion of the external review and associated report, it will be useful for the Education Portfolio Team to reconvene. At that time, all participants will have not only an opportunity to review this final report, but also to review the comments and recommendations prepared by the external panel members. In addition, by including in that discussion the Education Program Roadmap Document developed by NPLs within the SERD Unit in (Table 4 Appendix - Section I) as part of the evolving education strategic plan, the Education Portfolio Team will have a better opportunity to produce a comprehensive assessment.

Education Portfolio Appendices

United States Department of Agriculture
Cooperative State Research, Education, and Extension Service
Office of Planning and Accountability



November 2008

Table of Contents

Appendix - Section I	1
Table 1: Education CRIS Summary Funding	2
Tables 2: Initial Attempt to Report Funding of Primary Programs by Educational Areas	3
Table 3: Outcomes of Primary Funded Projects by Program and Target Area	15
Table 4: Proposed NPL Program Roadmap.....	53
Table 5: Partnering Agencies and Organizations.....	62
Appendix – Section II	63
Table 6: Legislative Authorizations and Eligibility for Primary Programs.....	64
Table 7: Web Resources for Awarded Primary Funded Projects	68
Table 8: Enrollment by Program Area as Reported in FAEIS 2002-2006	69
Tables 9: Degrees Awarded in the Food and Agricultural Sciences Programs by Degree Level 2002-2006	70
Table 10: Gender of Graduates Across all Degree Levels in Selected Fields	73
Table 11: Ethnicity of Graduates Across all Degree Levels in Selected Fields	74
Table 12: Ph.D Recipients in Selected Agriculture Disciplines 2002-2006.....	76
Table 13: NPL Summary of Program by Target Area.....	77
Appendix – Section III	83
Table 14: Legislative Background for Selected Secondary Educational Programs	84
Table 15: Other Science and Education Resources Development (SERD) Programs Making Secondary Contributions to Education Portfolio	86
Table 16: Natural Resources and Environment (NRE) Contributions to Education Portfolio	95
Table 17: Economic and Community Systems (ECS) Contributions to Education Portfolio	101
Table 18: 4-H and Youth Development Contributions to Education Portfolio	107
Table 19: National Research Initiative Competitive Grants Program (NRI) contributions to Education Portfolio	114
Table 20: Educational Contributions of Cross-Unit Programs.....	123
Acronym Definitions	129

Appendix - Section I

Table 1: Education CRIS Summary Funding

CRIS Summary Funding Table for Primary Knowledge Areas for FY 2002-2006						
Funding Sources	(\$ in the Thousands)					
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Grand Total
All CSREES Funding	\$4,528	\$29,353	\$29,510	\$40,740	\$40,465	\$144,596
All non-CSREES Funding	\$10,228	\$7,260	\$9,124	\$18,567	\$11,249	\$56,428
Total Funding	\$14,756	\$36,613	\$38,634	\$59,307	\$51,714	\$201,024
Percentage of CSREES Funding	31%	80%	76%	69%	78%	72%

Source: Current Research Information System

Tables 2: Initial Attempt to Report Funding of Primary Programs by Educational Areas

Funding for Graduate Student Training to Meet Emergent Workforce Needs Through the National Needs Graduate & Postgraduate Fellowship Grants Program FY 2002 - 2006.

National Needs Graduate Fellowship Grants Program						
	FY 2002	FY 2003/2004	FY 2004	FY 2005	FY 2006	Total
Number of Stipends to Support Student Beneficiaries	82 (Ph.D.)	*	7 Doctoral IRTAs	75 (Ph.D) 22 (M.S.)	101 (Ph.D.) 43 (M.S.) & 95 IRTA	258 (Ph.D.) 65 (M.S.) & 102 IRTAs
Number of New Projects Funded	24	*	(4)**	39	29	92 (4)**
Workforce Development Student Training	\$5,658,000	*	*	\$5,603,000	\$6,024,000	\$17,285,000
Workforce Development Global Competency	\$50,513	*	\$33,470	\$26,260	*	\$110,243
Total	\$5,708,513	*	\$ 33,470	\$5,629,260	\$6,024,000	\$17,395,243

* Not available – not offered due to pooling of funds across fiscal years.

** Supplemental funding to existing award.

Funding by Education Category through the Higher Education Challenge Grants Program, FY 2002 - 2006.

Higher Education Challenge (HEC) Grants Program						
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Teaching Capacity: Curricula Development, Instruction & Learning Outcomes	\$2,287,281	\$2,586,817	\$1,553,265	\$1,792,693	\$3,383,196	\$11,603,252
Teaching Capacity Development Faculty Re- tooling; Increase teaching capability & effectiveness	\$ 0*	\$0	\$0	\$282,321	\$263,229	\$545,550
Innovations in Education	\$823,426	\$1,211,080	\$1,878,450	\$1,732,374	\$1,041,996	\$6,687,326
Workforce Development Experiential Learning	\$718,216	\$846,742	\$1,133,692	\$982,629	\$0	\$3,681,279
Workforce Development Global Competency	\$228,472	\$0	\$0	\$141,262	\$146,565	\$516,299
Diversity in Food & Agricultural Sciences Human Capital Development	\$0	\$0	\$0	\$275,924	\$489,549	\$765,473
Total	\$4,057,395	\$4,644,639	\$4,565,407	\$5,207,203	\$5,324,535	\$23,799,179

* No funds awarded in category for fiscal year.

Funding by Education Category, FY 2002 – 2006 for Secondary & Two-Year Postsecondary Agriculture Education Challenge (SPEC) Grants Program.

Secondary & Two-Year Postsecondary Agriculture Education Challenge (SPEC) Grants Program						
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total (\$)
Teaching Capacity: Curricula Development, Instruction & Learning Outcomes	\$503,071	\$534,676	\$680,933	\$605,157	\$716,772	\$3,040,609
Institutional Capacity Development: Recruitment & Retention	\$40,000	\$ 0*	\$0	\$79,716	\$132,480	\$252,196
Teaching Capacity Development Faculty Re-tooling; Increase teaching capability & effectiveness	\$0	\$143,096	\$73,072	\$41,101	\$0	\$257,269
Innovations in Education	\$215,207	\$122,053	\$34,086	\$29,776	\$34,225	\$435,347
Workforce Development Experiential Learning	\$142,960	\$120,000	\$39,780	\$65,666	\$0	\$368,406
Workforce Development Global Competency	\$0	\$39,937	\$0	\$49,130	\$0	\$89,067
Diversity in Food & Agricultural Sciences Human Capital Development	\$25,000	\$0	\$0	\$49,511	\$33,931	\$108,442
Total	\$926,238	\$959,762	\$827,871	\$920,057	\$917,408	\$4,551,336

* No funds awarded in category for fiscal year.

Funding for Scholarships for Students Pursuing Food & Agricultural Science Baccalaureate & Doctor of Veterinary Medicine Degrees, FY 2002 – 2006

Higher Education Multicultural Scholars Program						
	FY 2002	FY 2003	FY 2004*	FY 2005	FY 2006	Total
Workforce Development Student Training	\$955,000	\$994,000	\$-	\$1,582,000	\$1,041,000	\$4,572,000
Number of New Projects Funded	11	11	-	14	8	44
Funds Provided for Number Scholarships to Student Beneficiaries	53 (Baccalaureate); 5 (Veterinary Medicine)	54 (Baccalaureate); 5 (Veterinary Medicine/Animal Science)	-*	58 (Baccalaureate); 10 (Veterinary Medicine)	50 (Baccalaureate); 4 (Veterinary Medicine)	162 Baccalaureate & 24 Veterinary Medicine Student Scholarships

* Program not offered in fiscal year.

Total Funding by Fiscal Year through the 1890 Capacity Building Grants Program, FY 2002 - 2006

1890 Capacity Building Grants Program						
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Students Supported						
- Teaching		6,724	6,210	4,823	5,412	23,169
- Research						
# Projects Funded	41	46	47	44	44	222
- Teaching	24	28	28	26	28	134
- Research	17	18	19	18	16	88
Total Teaching Funds	\$4,450,663	\$5,358,118	\$5,346,444	\$5,689,126	\$5,821,309	\$26,665,660
Total Research Funds	\$4,363,207	\$5,229,097	\$5,192,743	\$5,629,402	\$5,399,239	\$25,813,688
Total CBG Funds	\$8,813,870	\$10,587,215	\$10,539,187	\$11,318,528	\$11,220,548	\$52,479,348

Note: Less than half the awarded projects reported their student participation numbers

Funding by Education Category for 1890 Capacity Building Grants Program, FY 2002 - 2006

1890 Capacity Building Grants Program						
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Teaching Capacity: Curricula Development, Instruction & Learning Outcomes	\$575,025	\$1,019,965	\$760,910	\$1,093,661	\$732,787	\$4,182,348
Institutional Capacity Development: Recruitment & Retention	\$1,090,958	\$388,038	\$384,099	\$596,309	\$1,446,222	\$3,905,626
Teaching Capacity Development Faculty Re- tooling; Increase teaching capability & effectiveness	\$305,660	\$594,408	\$582,256	\$606,993	\$0	\$2,089,317
Teaching Capacity Development New Programs	\$0	\$1,395,533	\$557,624	\$1,399,534	\$493,545	\$3,846,236
Innovations in Education	\$985,917	\$1,395,533	\$341,389	\$698,300	\$0	\$3,421,139
Workforce Development Student Training	\$394,990	\$0	\$1,530,802	\$699,162	\$1,063,531	\$3,688,485
Workforce Development Pipelined from K-12 to UG to Grad	\$0	\$197,255	\$0	\$0	\$599,856	\$797,111
Workforce Development Experiential Learning	\$199,719	\$170,385	\$0	\$506,647	\$592,612	\$1,469,363
Workforce Development Global Competency	\$100,579	\$0	\$200,000	\$199,029	\$493,819	\$993,427
Diversity in Food & Agricultural Sciences Human Capital Development	\$797,815	\$0	\$794,196	\$200,000	\$199,920	\$1,991,931
Capacity Development Teaching & Training Infrastructure	\$0	\$799,320	\$195,168	\$196,138	\$199,017	\$1,389,643
Total	\$ 4,450,663	\$5,358,118	\$5,346,444	\$5,689,126	\$5,821,309	\$26,665,660

Funding by Education Category through the Hispanic-Serving Institutions Grants Program, FY 2002 - 2006

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Teaching Capacity: Curricula Development, Instruction & Learning Outcomes	\$554,930	\$646,187	\$737,148	\$888,896	\$942,716	\$3,769,877
Institutional Capacity Development: Recruitment & Retention	\$554,930	\$646,187	\$737,148	\$888,896	\$942,716	\$3,769,877
Teaching Capacity Development Faculty Re-tooling; Increase teaching capability & effectiveness	\$554,930	\$646,187	\$737,148	\$888,896	\$942,716	\$3,769,877
Workforce Development Pipelined from K-12 to UG to Grad	\$554,930	\$646,187	\$737,148	\$888,896	\$942,716	\$3,769,877
Workforce Development Experiential Learning	\$554,930	\$646,187	\$737,148	\$888,896	\$942,716	\$3,769,877
Capacity Development Teaching & Training Infrastructure	\$554,930	\$646,187	\$737,148	\$888,896	\$942,716	\$3,769,877
Total	\$3,329,579	\$3,877,121	\$4,422,889	\$5,333,377	\$5,656,296	\$22,619,262

Funding from Tribal College Education Equity Grants Program, FY 2002 - 2006

1994 Tribal Land Grant Equity Capacity Building Grants Program						
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Students Supported	0	0	6	117	345	468
# Projects Funded	31	31	32	33	30	157
Total TCEG Funds	\$1,549,000	\$1,689,000	\$1,679,000	\$2,232,000	\$2,304,000	\$9,453,000

Note: Less than half the awarded projects reported their student participation numbers.

Funding by Education Category for Tribal College Education Equity Grants Program, FY 2002 - 2006

The 1994 Tribal Land Grant Equity Capacity Building Grants Program						
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Teaching Capacity: Curricula Development, Instruction & Learning Outcomes	\$710,000	\$708,271	\$577,168	\$676,363	\$537,670	\$3,209,472
Institutional Capacity Development: Recruitment & Retention	\$435,666	\$544,823	\$472,230	\$676,364	\$844,910	\$2,973,993
Teaching Capacity Development Faculty Re- tooling; Increase teaching capability & effectiveness					\$76,810	\$76,810
Innovations in Education	\$403,334	\$435,856	\$577,167	\$879,273	\$844,920	\$3,140,550
Capacity Development Teaching & Training Infrastructure			\$52,470			\$52,470
Total	\$1,549,000	\$1,688,950	\$1,679,035	\$2,232,000	\$2,304,310	\$9,453,295

Funding by Education Category for Alaska Native-Serving & Native Hawaiian-Serving Institutions Education Grants Program, FY 2002 - 2006

Alaska Native-Serving & Native Hawaiian-Serving Institutions Education Grants Program (ANNH)						
	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Teaching Capacity: Curricula Development, Instruction & Learning Outcomes	\$159,402	0	0	\$1,660,933	0	\$1,820,335
Institutional Capacity Development: Recruitment & Retention	\$318,804	0	\$181,789	\$182,000	0	\$682,593
Teaching Capacity Development Faculty Re-tooling; Increase teaching capability & effectiveness	361,828	0	0	0	0	\$361,828
Teaching Capacity Development New Programs	\$0	0	0	0	\$125,000	\$125,000
Innovations in Education	\$172,028	\$201,859	0	0	0	\$373,887
Workforce Development Student Training	0	\$179,002	\$1,497,325	0	\$150,000	\$1,826,327
Workforce Development Information Resources	0	\$179,002	\$141,344	0	0	\$320,346
Workforce Development Experiential Learning	\$159,402	0	0	0	\$913,345	\$1,072,747
Diversity in Food & Agricultural Sciences Human Capital Development	\$478,206	\$1,662,297	0	\$1,273,538	\$1,688,345	\$5,102,386
Capacity Development Teaching & Training Infrastructure	\$159,402	0	\$149,732	\$205,395	\$200,000	\$714,529

Alaska Native-Serving & Native Hawaiian-Serving Institutions Education Grants Program (ANNH)

	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	Total
Collaborate with college & university, & other stakeholders to determine education issues, needs, & priorities	\$900,762	\$923,432	\$1,024,460	0	0	\$2,848,654
Total	\$2,709,833	\$3,145,592	\$2,994,650	\$3,321,866	\$3,076,690	\$15,248,632

**Funding by Education Category for Resident Instruction Grants for Institutions of Higher Education in Insular Areas (RIIA),
FY 2005-2006**

Resident Instruction Grants for Institutions of Higher Education in Insular Areas (RIIA)			
	FY 2005	FY 2006	Total
Capacity Development - Teaching & Training Infrastructure	\$370,000	\$469,189	\$839,189

Table 3: Outcomes of Primary Funded Projects by Program and Target Area

Program Name	#	Description	Area
Agriculture in the Classroom (AITC)		Beginning in 1981, U. S. Department of Agriculture Cooperative State Research, Education and Extension Service has sponsored an outreach program to K-12 teachers to advance agricultural literacy, helping students in the classroom learn how food is produced and what all it goes through to get to the dinner plate. Annually, USDA’s Ag in the Classroom network of state contacts work with more than 90,000 classroom teachers, 20,000 pre-service teachers, and 20,000 volunteers to advance agricultural literacy and nutrition education. These teachers and volunteers use Ag in the Classroom resource materials with more than five million students each year. U.S. Department of Agriculture’s annual investment in Ag in the Classroom serves as a magnet that attracts more than \$10 million in non federal contributed resources that support the advancement of agricultural and human nutrition literacy.	Summary
	1	<u>The Agriculture in the Classroom National Website: (www.agclassroom.org)</u> The Agriculture in the Classroom Program developed a website in 1999 to increase the visibility of the program nationwide and provide the public, teachers, and the State programs information about general and local information and resources. Teacher resources on the AITC website include lesson plans which are aligned to state and/or national education standards, program ideas, workshops, educational conferences, and professional development opportunities. Student information on the website includes state agricultural profiles, kid zone activities, food facts, agriculture fun, virtual field trips, teen scene, career options, and more.	1, 2, 3
	2	<u>Agriculture in the Classroom National Resource Directory (NRD)</u> The AITC National Resource Directory is an online database which lists hundreds of educational materials about agriculture. It was designed to help educators locate high quality resources about agriculture for a PreK through 12th grade youth audience. The resources in the directory cover a variety of agricultural subjects, and include lesson plans and other printed material, children's literature, CDs, videos, posters, kits, and instructional websites. The educational material is searchable by title, agricultural content, grade level, academic subject, media type and area of the country addressed in the resource. This teacher resource directory is designed to highlight some of the best educational resources available for incorporating agriculture into your classroom.	1, 2, 3, 4, 5

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
	3	<u>Excellence in Teaching About Agriculture: An Awards Program</u> -- Seeking to recognize the outstanding efforts of educators in teaching about agriculture, the USDA AITC program and the Ag in the Classroom Consortium established an awards program. This competitive program recognizes teachers for their successful efforts in teaching agricultural concepts in their curriculum. Teachers are selected by a panel of experts knowledgeable in agriculture, education, and AITC for their outstanding contributions to education about American agriculture. Funding supports travel expenses for each winning teacher to attend the National Agriculture in the Classroom Conference, the purchase of educational materials, and professional development.	1
	4	<u>Agriculture in the Classroom Enrichment Grants</u> Agriculture in the Classroom Enrichment Grants program was established in 2003 to strengthen state programs by funding innovative ideas and proven outreach strategies to increase agricultural literacy among teachers and their students. The projects must address a state, regional, or national educational need; involve creative or nontraditional approaches toward addressing that need that can serve as a model to others; and encourages and facilitates better relationships in the education community.	6
	5	<u>Agriculture in the Classroom National Conference</u> The National AITC conference is a key activity in strengthening state AITC program efforts across the nation. Conferences bring together AITC State Contacts and educators to discuss success stories, share common problems and solutions, and to see and test new educational resources. Workshops and sessions focus on training teachers and leaders in implementing State action plans, working with school officials and educators and establishing training programs, introducing new curricula, and professional development activities. The conferences are held annually by region.	1
Secondary and Two-Year Post-secondary Agriculture Education Challenge Grants (SPEC)		From FY 2002-2006, the SPEC grants program has awarded \$4.5 million to improve the teaching of agricultural sciences within US high schools with agriscience offerings, and at two-year, associate degree-granting community and junior colleges. For each year during this same period, the program made approximately 28 awards, and the average award amount was \$23,000. The majority of funding supported educational equipment and supplies and faculty salaries. Most awards averaged two years in duration.	Summary

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
	1	<p><u>Pioneering Biotechnology Education in New Hampshire [NH]</u>: Seacoast School of Technology was awarded funds to establish a Network of NH teachers and resources with a focus upon agricultural biotechnology and training to integrate this technology into current curricula. Students developed a New England Museum of Science GMO display and an Agricultural-Biotech Curriculum Guide, as well as participated in Agricultural-Biotech regional workshops with the result of integrating agricultural biotechnology into the NH science curriculum. This funded institute provided over 200 NH teachers with the academic resources necessary to integrate agricultural-based biotechnology lessons and labs into traditional biology curricula. A study showed 100% of participating students (75 students/year) met 100% of the planned Biotechnology competencies, and 90% of these students scored at least an 85% on their project. One hundred percent of the Biotechnology students completed ‘Running Start’ college credits, 23% of the Biotechnology students were placed in internships and 90% received a grade of 85% or higher in Biotechnology II. A minimum of 5,000 people visited the biotechnology display New England Museum of Science.</p>	1, 2, 3, 4
	2	<p><u>New Career Paths In Agricultural Education</u>: Norfolk County Agricultural High School received funding through this program to expand the animal science curriculum to include locally relevant fields of animal care and production, namely the care and management of wildlife and laboratory animals. The program also included direct teacher participation alongside the students. A six week internship at cooperating sites has already occurred for 20 students. The interns began their program by participating in a seven-day survey course on Environmental Biotechnology, offered through a cooperating partner, Massachusetts Bay Community College. Here they focused on the biotechnical skills and lab procedures that would be required during the internships. Students participating in this program all passed the two credit college course with a minimum of a B average, and now have a college transcript to take with them after graduation from high school.</p>	1, 2, 3, 5
	3	<p><u>Agriscience Careers</u>: At least 90 Hispanic students at Firebaugh High School, located in the heart of an agricultural area, have now begun to enter professional and technical careers at local science based agricultural operations. Through funding by SERD, five agricultural science courses for 9th and 10th graders were developed. During the grant period, West Hills faculty taught two courses on the Firebaugh campus to a total of 35 students. In Fall 2006, 352 students enrolled in at least 1 of the agriculture-related courses offered; in Fall 2007, enrollment rose to</p>	2, 3, 4

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		382. Enrollment in the 9th and 10th grade courses met the grant-stipulated 300 students; enrollment in the 11th and 12th grade courses exceeded 75 students. Of the 39 graduating seniors who completed four years of Firebaugh's agriculture program in 2007, 23 (nearly 60%) went on to college. Seven reported that they would enter agricultural majors at two- or four-year Institutions. At the time of graduation, three additional seniors already had secured employment in the agricultural industry.	
	4	Most animal science curricula still focus on traditional agricultural and aquaculture species, and New England continues to experience a decline in these conventional animal agriculture fields, while at the same time, new emerging fields of animal biomedical research and biotechnology have grown dramatically. This SPEC project addressed this problem by developing two, complementary approaches. First, an animal science curriculum was expanded to include locally relevant fields of animal care and production, namely the care and management of wildlife and laboratory animals, while including direct teacher participation in the program along side the students. Second, formal relationships were established with leading institutions in science education, wildlife rehabilitation, and laboratory animal care. Those relationships extended the schoolroom beyond the campus to provide students with first-hand experience and training in current approaches to responsible animal stewardship within growing segments of the local job market. New fields open to graduates involve wildlife care and management and the use of laboratory animals in biomedical research and biotechnology, and require at least an introductory familiarity with contemporary scientific methods and laboratory skills. Over the course of two years, 20 11 th grade students participated in a year-long program that culminated in a six-week internship at research animal facilities and wildlife centers (Massachusetts General Hospital, New England Wildlife Rehabilitation Center). Students participating in this program all passed the two-credit college course with a minimum of a B average, and now have a college transcript to take with them after graduation from high school. In addition, students completing this experience are prepared to meet the Massachusetts Certificate of Occupational Proficiency Standards. Many students are now prepared to embark upon new career paths in research, biotechnology and animal care that include specific career plans to enroll in two- and four-year colleges. Pre- and post-assessment surveys indicated a 50% increase in the number of students interested in the field of laboratory research, and a 30% increase in interest in the field of wildlife rehabilitation. Training also received by faculty through this professional development	1.2.6

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
	5	<p>will directly impact their teaching.</p> <p>Many agricultural students enter postsecondary institutions as at-risk students. Some are first generation college-bound students, while others are academically deficient to pursue rigorous agricultural science fields. Retention of these students is difficult until they establish adequate study habits, master remedial skills, and acquire professional goals in agriculture. Career shadowing and career fairs have been shown, when combined with guidance from well-trained, academic mentors, to help students visualize and address their future in agriculture. Without receiving practical experience, students often lose focus and question a topic's relevancy, which in turn, may affect their ability to succeed in college. In this SPEC-funded project, lectures are combined with real-time, on-farm experiences to help student learn and grow academically. Funding helped to establish a living laboratory on Eastern Oklahoma State College's 4,000 acre farm, where mentoring, advising and experimental learning activities help students to acquire needed proficiency in skills that are reinforced by active learning. Survey results show an increase in retention of 22 percent for students majoring in agriculture over pre-funded project levels. Graduation rates of these same students have exceeded the projects goal's by 21 percent. The educational model has been shared with other community colleges in the region as well as nationally through the NACTA Conference.</p>	3,4,5
Higher Education Challenge Grants (HEC)		<p>From FY 2002-2006, HEC grants program has awarded nearly \$24 million to improve the teaching of agricultural sciences at US colleges and universities. For each year during this same period, the program made approximately 29 awards, and the average award amount was \$173,000. The majority of funding supported faculty salaries, educational equipment and supplies, and student stipends. Most awards averaged three years in duration.</p>	Summary
	1	<p><u>American Seed Technology Using Distance Education program</u>: The grant provided funds for the production of DVDs on coffee, corn (maize), forage grass and sunflower seed production. In addition, an International Seed Production Class was made available on Ohio State University's Seed Biology Program website. A total of 50 students from three countries participated in the program. The program exposed them to greater international perspective on seed technology. Students in Kabul University in Afghanistan as well as the Vietnam Academy of Agricultural Science participated in the program.</p>	4, 5, 6

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
	2	<p><u>Streamside Science-An Online Approach to Field Based Education</u>: Through funding, Montana State University established a water quality course with laboratory and field components. An outreach and recruitment mechanism was created on the Montana State University’s water quality team’s website. At the start of the 2007 class, 88% of the participants reported “marginal to no comfort” in teaching water resource science to their student. By the end of the course, 63% of the teachers reported “good to exceptional” enhancement in their comfort in teaching the subject. The course is serving as a model for development of other field-based, experimental learning course in Natural Science at the University.</p>	1, 2, 3, 5
	3	<p><u>A National Assessment of Learner Centered Approaches to Teaching in Colleges of Agriculture</u>: This project explored and described the use of learner-centered methods by teaching faculty in colleges of agriculture in the United States. A total of 21,364 students were impacted by this project. In the national case study, students (n = 1,200) in the exemplary professors' courses were more motivated to learn, more cognitively engaged, and used more active learning strategies because of the learner-centered teaching approaches compared to a large comparison group of professors. Due to the faculty development workshops, over 300 professors improved their understanding of learner-centered teaching approaches and how their teaching methods influence student outcomes. Professors were motivated to implement a new teaching method to make their courses more engaging for students after they participated in the workshops, which indirectly impacted 20,164 students. The project also reached a total of 8,125 professors, administrators, and graduate students in the agricultural, environmental and life sciences. A total of 197 administrators in higher education received communications about learner-centered teaching approaches and faculty development opportunities and resources.</p>	1, 5
	4	<p><u>Socially Responsible Advertising and Promotion of Food, Fiber and Related Products</u>: The program developed a number of Integrated Set of Undergraduate Courses. The courses foster socially responsible advertising and promotion. In collaboration with three other universities, Colorado State University is developing a Web-course serving 150-200 students. The course will be used by other schools as well by advertising and journalism students. The project will foster better dialogue between advertising industry and academia, possibly leading to new internships and learning opportunities.</p>	2,5, 6

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
	5	<u>Cultivating New Leaders in Global Agriculture:</u> U.S. agribusiness is becoming increasingly dependent on trade and optimal job prospects, therefore, U.S. students must gain confidence working with other cultures. In this funded project, four students studied agriculture abroad in the southern state of Karnataka at the University of Agricultural Sciences in Bangalore, and six additional students participated in a program in southeastern Uganda in the Kamuli District at the Makerere University in Kampala. The study abroad model, and the related modules with their learning activities, can be adapted by other institutions that wish to provide similar learning experiences for their students. Students who participated are expected to join the workforce better prepared to provide leadership in global agriculture.	3, 5, 6
	6	<u>The Science of Foods for Health:</u> In this funded project, 20 students who graduated in medicine, horticulture and food science from three institutions, now have a better understanding of the link between foods and health and will begin their career with professional links to scientists in other fields that typically take much longer to build.	3, 6
	7	During the period of this review, a grant award supported the development a web-based course on Seed Testing. U.S. students gained enhanced global competency through the course with participants from Brazil, Chile. The web-based modules have been reviewed by professional seed organizations. Schools in Afghanistan and Vietnam have used the course materials. Shared knowledge between the United States seed technologist and researchers and their peers around the world prepare both U.S. and foreign students to work in a global seed industry.	2, 5, 6
	8	The American Cancer Society estimates over one-half million Americans will die of cancer each year, and that nearly one third of those cancer deaths are diet related. In this funded project, a three-university collaborative is trying to stem the increase in diet-related fatalities by establishing multi-disciplinary curriculum modules to provide faculty and students with better nutrition and diet-related information. Students will participate in research internships and in interstate exchanges to help students better understand linkages between eating healthier foods and improved health. Students will also have improved critical thinking about advertising and health claims in food advertisements. Graduates of the program will provide training to high school teachers on foods and health. This will, in turn, help those secondary teachers provide younger students with nutrition information to inspire critical thinking about making improved nutritional choices.	2,3,6
	9	Food safety veterinarians need new cutting-edge knowledge of bio-security, food safety, risk	2

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		management and risk communication skills in the workplace. Responding to this need, the DVM program at Michigan State University developed a project to address the critical link in food safety and quality control by constructing a specialization in food safety that goes beyond what is available in the MS food safety program in the fields of microbiology, epidemiology and disease control. Funding developed an on-line curriculum that resulted in new courses leading to a certificate now available to students. One of the new courses will also be used in a novel program to combine the DVM with a dual degree leading to a Master's in Public Health. This joint program will enhance collaboration between the school of veterinary medicine and other related departments by developing courses that articulate well within disciplines and that result in providing needed skills to new DVM graduates who will have better job prospects in food safety management because of enhanced training provided by this degree certification.	
	10	Organic agriculture is the fastest-growing sector of agriculture today, but few educational programs exist in the U.S. to prepare students for careers in this field. In this project, the University of Georgia developed a set of courses leading to a <u>Certificate in Organic Agriculture</u> . On the campus, a working farm certified by USDA as organic, provides an optimal classroom for students. In addition to resident students, the project also supports a website providing outreach materials to farmers in order to involve them alongside students in promoting an appreciation of organic agriculture. These area organic farms are also offering student internships to increase student's appreciation for learning the business of managing an organic enterprise. In addition, by working with University Health Center, students are provided additional opportunities to learn about how to promote a healthier diet.	2,3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
HEC & Multicultural Scholars Program (continuation project)	1	<u>Implementation of the First Four-Year Forestry Program at a Tribal College:</u> Native American students are grossly under-represented in the forestry profession. Current enrollment of Indian students in four-year forestry programs approximates 18 nationwide. To increase the numbers of Native American in forestry, Salish Kootenai College is developing a BS degree in this field. The new program is approved by the Salish Kootenai College Board of Directors and received accreditation by Northwest Commission on Colleges and Universities. There has been noticeable increase in student engagement when lessons include specific examples of Native American management practices. Junior level classes in the forestry program were successfully completed by five of six students in the new cohort with an average GPA of 3.2. Student recruitment in the forestry program has increased by over 20%, including students from at least seven tribes. After only one year, the institution has approximately doubled the number of Native American students enrolled in four-year forestry programs nation wide. This program was started with a HEC grant and five student participants in the program have been supported with scholarship awarded under the Higher Education Multicultural Scholars Program (MSP).	2, 3, 6
Tribal Colleges Education Equity Grants (TCEG)		The program provided the 1994 Land-Grant Institutions with funding to develop curricula that incorporate indigenous knowledge and culture into is framework. The funding also allowed e-learning and building capability to reach a population that is often unable to attend campus-based courses and degree programs. As a result, 1994s developed Food, Agriculture and Natural Resource Degree programs and concentrations, leveraging other more constrained grant resources to build capacity at Tribal Colleges (TC). As an outcome, the number of students moving from TC to four-year Institutions is significantly increased, graduation rate improved, and the number of students enrolling in Food, Ag or Natural Resource programs was also increased. Significant improvement in college facilities with modern labs, computers and networks has been achieved.	Summary
	1	<u>Curriculum Development: Conservation of Rana Pipiens and Ecology of Desert Wetland in Navajo Nation:</u> Dine’s College developed an AS Degree in Environmental Science and provided student internships and opportunities for field research and faculty training in biological field work. The Institution also incorporated Navajo culture and language into all curriculum modules created. As an outcome, the number of campuses offering a new course in Environmental Science was increased and also the number of declared Environmental majors and enrollment was increased and higher completion rate was also achieved. Several students	1, 2, 3, 5

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		transferred to four-year colleges and student interns were placed with the National Park Service. Two faculty members involved received NSF funding to train in Biology field work at Washington State.	
	2	<u>Sustainable Development</u> : The project incorporated distance education technologies into, and redesigned courses in Sustainable Development to better serve non-traditional students at College of Menominee Nation. The program offered sustainable development class utilizing IPODS and also modified the course delivery and learning methods around new technology. The New course offering in sustainable development had 30 students that posted a 96% attendance record for the entire course. Due to changes in teaching technology, College enrollment is highest in 15-year history; agreement with University of Wisconsin to accept credits from sustainable development courses for a four-year degree program and Sustainable Development course was made a College general education requirement. The Institution leveraged this grant for additional private sector funding (Apple) for additional computer labs and equipment and it was awarded the 'Apple University' distinction. A number of faculty members are rethinking the use of new technology and distance education in their classes.	2, 3, 4, 5, 6
	2	<u>Four-Year Curriculum Development</u> : The funding program assisted in the development of a four-year science degree program and 2 upper division science classes. In addition, new web-based classes, transferable to 1862 Natural Resource programs were developed. As significant outcome, Northwest Indian College (NWIC) now has a B.S. in Native Environmental Science which attracted students to NWIC who otherwise would go to other institutions.	2, 3
	3	<u>Enhancing Nutrition Education</u> United Tribes Technical College award seven science research internships for the summer of 2005; increased numbers of students from Tribal Colleges transferred to four-year institutions: two students graduated and enrolled in North Dakota State in Nutrition; one student was hired by the tribal college as an Extension Nutrition Assistant.	3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
	4	Fort Peck has been using the CSREES Tribal Equity and Endowment awards as well as other USDA grant programs to build a distance learning capacity within the college. This is a well focused and leveraged program that allows Fort Peck Community College to pay for the online services and the instructional costs associated with this program, such as telecommunication, internet services and associated distance learning at Fort Peck Community College. FPCC is use existing articulation agreements to tap into agriculturally related sciences courses from MSU-Bozeman and institutions of higher education. In addition, Rocky Mountain College and other Tribal Colleges that are now on-line with the Vision Net System will allow for the expansion of curriculum and agricultural offerings.	4
Tribal Colleges Endowment Fund	1	Salish Kootenai College was able to increase student enrollment at the college by offering a CSREES funded curriculum, Baccalaureate Environmental Science Program. The college is looking to increase its student's accessibility to four-year degree programs through challenging classroom and hands-on field experiences, knowledgeable instructors, accessibility to the internet, and distance learning education. College is in the early planning stages to convert two agricultural sciences two-year Associate Degree Programs to four-year Baccalaureate Programs.	2, 3
	2	The United Tribes Technical College chose to escrow funds, and devised intricate objectives for use of these monies. Once college Equity funds have reached a certain amount, the college plans to use funding to plan and develop curriculums of two additional degrees focusing on healthful nutrition classes; employ adequate trained staff to ensure culturally important learning styles vs. faculty instruction; and partner with an 1862 University, American Dietetic Association, local college culinary arts program, and Indian health services, to develop formal and community educational programming in diets, tourism management, Type 2 diabetes, and culinary arts.	2, 5, 6
Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grants (ANNH)		Alaskan Native-Native Hawaiian (ANNH) grant program has increased the participation of Alaskan Native and Native Hawaiian student graduates with increased scientific knowledge in local industries like fisheries and forests resources. The program also supported cross-cultural learning experience by Alaska Native student taking courses at Hawaiian Native serving institutions, allowing the leveraging of scientific knowledge and its application in native cultures.	Summary
	1	<u>Pilot first ethnobotany course at University of Alaska Fairbanks:</u> The Ethnobotany Certificate Program is designed to provide an avenue for students in rural Alaska to study science-based	2, 3, 5

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p>courses in familiar and culturally-relevant areas, local plants and their traditional uses. A total of 18 students enrolled in the first Ethnobotany course at University of Alaska Fairbanks. Archived lectures and course materials from the Seminar in Ethnobotany were put onto CD-ROMs for distribution to appropriate community partners. Cross-cultural learning experience was fostered by Alaska Native students taking courses at Hawaiian Native serving institution. Under the new ethnobotany faculty's direction, students participated in research opportunities to address regional questions and develop regional plant and plant use database.</p>	
	2	<p>The University of Hawaii's (UH) <u>Agribusiness Education, Training and Incubator Project (AETI)</u> is assisting fledgling and growth-oriented agribusinesses in the state of Hawaii by offering hands-on business consulting services including business plans, cost of production analyses, marketing plans, and project management. Over 2.5 years of operation, AETI has assisted 41 agribusinesses and organizations. The agribusiness clients of the program have demonstrated growth well beyond industry norms. Over the past two years, the clients of AETI, on average, increased staffing by 33 percent, revenues by 121 percent, and net profits by 97 percent. Further, students from the university-wide system receive on-the-job training at agribusinesses, bio-processing and biotechnological entrepreneurship.</p>	6
	3	<p><u>UH Manoa/CTAHR Education and Workforce Development:</u> The program increases the number of students who enter the fields of biotechnology and bioproducts development, and sustainable agriculture and ecosystems. The consortium successfully completed the strategic plan for transforming K-16 education programs in agriculture and natural resource management in Hawaii. The program also led to dual certification in Agriculture Education and Science Education. Several agriculture secondary-education teachers now certified to teach science. Successful student internships were undertaken on islands of Kauai, Maui, and Oahu. The program produced stronger native workforce in agriculture and natural resource management on these islands.</p>	1, 3, 5
	4	<p><u>UAS Ketchikan Fisheries Technology Program:</u> The program addressed Rural and Native Alaskans need access to higher education in fisheries and aquaculture sciences through a distance delivered classes and lab sessions. The program enhanced recruitment and retention activities and targeted outreach to rural schools, presentation of information about fisheries education and career opportunities, one-on-one program faculty advising and mentoring before, during and after program enrollment.</p>	3, 5

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
	5	<u>Animal Migration and Demographics</u> : This program aimed at the development of an experiential learning program to expose ANNH students to field research, laboratory molecular ecology techniques and mentors engaged in scientific research. Professional development and increased scientific competency leading to sustained interest in pursuing scientific careers for 25 ANNH students enrolled in University of Alaska biology courses.	3, 5
	6	<u>Science Education at Honolulu Community College (HCC)</u> : The program Enhanced Marine Science and Aquatic Food Resources as well as Biology program. The college developed and offered new courses in oceanography and biology and upgraded existing instructional facilities into multi-media state-of-the-art classrooms. Over 200 students per semester enrolled in grant-supported courses and Approximately 100 students were recruited into the marine option certificate program. The program provided internships in aquaculture and aquaponics and supported financially disadvantaged students. In addition, the program increased student knowledge in marine and environmental science, food resources, and/or biology and developed student technical skills in aquaculture and aquaponics. The program attracted more students into the grant-funded courses, improved instructional support of the College's Library.	2, 3, 5
	7	<u>The University of Hawaii College of Tropical Agriculture and Human Resources Education and Workforce Development Project</u> , in partnership with the University of Hawaii system of nine consortium members/campuses, undertook an integrated effort to strengthen Agriculture and Natural Resource Management Science Education (ANRM) in Hawaii to increase the number of students that entered the fields of biotechnology and bio-products development, and sustainable agriculture and ecosystems. The effort included strategic planning in student recruitment involving educators from K-12, Hawaii fifth graders and elementary school teachers, high school and college students within and outside of the state of Hawaii. Researchers in food and agricultural sciences, government agencies, UH's College of Education, Hawaii Department of Education and businesses participated in strengthening partnerships between educators and employers, and supporting student internships in agriculture and natural resource management. The project brought: (1) greater awareness in youth, students and primary school teachers of the life sciences and careers in agriculture and environmental sciences; and, (2) stronger and better environmental stewards of Hawaii's resources. It brought greater awareness in: (3) high school and college students of academic programs in ANRM and career opportunities in those fields. (4) More high school teachers became certified in science (a high need area in Hawaii) and	1, 3, 6

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		agriculture; (5) student interns returned to mentor employers or find employment in other ANRM professions; (6) more students entered ANRM fields of study and eventually employment; (7) more students selected ANRM fields in college; (8) more and better-trained graduates entered a stronger and larger local workforce in ANRM and related fields of employment; (9) increased percentage of underserved groups matriculating with HS diploma, associate/undergraduate/graduate degrees in the food and agricultural sciences. (10) The	
		program not only enhanced institutional capacity for teaching at K-12 and higher, it increased technological and global competitiveness of diverse food and agricultural science workforce through training, e.g. student interns assisting companies, learning new technical and soft skills, biological engineering, and robust partnerships and team-working skills with K-12 and higher education, businesses and local communities. Approximately 75% of the graduates are employed in an area related to their degree.	
	8	Through the <u>Recruitment, Retention and Educational Equity Program</u> , project-sponsored activities were incorporated into sustained college programs for native Alaskan students from remote areas of Alaska. Prince William Sound Community College was awarded a grant to aid students from remote areas of Alaska who face unusual challenges that often times prevent them from attending residential colleges. Providing scholarships, housing and meals was the assumption to attract more rural native Alaska students to college. The program improved communication with extended campus sites and the communities they serve. The program increased class retention and completion rates of rural Alaskan students by over 65% in 2005. An increase of 38% in enrollment of full time Native Alaskan students was noted in year one, with 23% additional increase in continuation year. Increase in overall GPAs went from 1.5 to over 2.4. Four USDA scholarship-funded Alaska Native students were inducted into the community college honor society Phi Theta Kappa, with one of these students on to baccalaureate studies at the University of Alaska Anchorage and University of Alaska Fairbanks.	3
	9	The University of Alaska Fairbanks, Northwest Campus is located in Nome about 600 miles northwest of Anchorage. Viable populations of reindeer, caribou, muskoxen and moose inhabit the wilderness surrounding Nome. Most local people have a substantial traditional ecological knowledge base, however, most individuals do not have the training in western science required to acquire and maintain positions with the state and federal governments. The purpose of this project, <u>High Latitude Range Management (HLRM) at Northwest Campus</u> , was to increase the	5,6

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p>likelihood that local people will be employed in natural science-related positions by providing a science education program that incorporates traditional ecological knowledge in northwestern Alaska. The project resulted in: hiring a full-time faculty to teach courses and promote program; delivering two HLRM intensive credited courses; teaching included distance delivery; and, development of pair-up courses for 10 students in English and Math, required for UAF Natural Resources Management 101 course. The students and faculty improved their discipline-related field skills in GPS navigation, Radio Telemetry Collar Identification, recognition of and familiarity with Brain Stem/Wasting Diseases, and lab related skills. Partnership with the Kawerak Reindeer Herders Association and UAF Reindeer Research Program offers a dynamic forum for discussions and the development of improved training protocols for the HLRM courses. Furthermore, the project developed opportunities for student research focusing on regional issues relevant to land management and reindeer herding and allowed collaboration with regional experts to promote local subsistence harvesting of reindeer. The curriculum incorporated many strategies and techniques for raising, managing, and slaughtering reindeer as a subsistence food, thus applying safer food practices for improved nutrition and health.</p>	
	10	<p>An award to the University of Alaska at Fairbanks (UAF), a four-year institution, to provide students with the opportunity to discover their talents and interests through the pursuit of their unique potential. Forty-five students participated in projects designed to combine traditional subsistence practices with the utilization of alternative energy sources. Students participating in the fisheries project witnessed the impact and implications of global warming through a two-degree increase in incubation temperature on salmon. Through the Russian Mission Subsistence-Based Health Education project from 2004 to 2006, twenty-eight participating students' math proficiency scores increased from 38 percent to 53 percent proficiency for a total of 15 percent improvement. Nine of these students presented the curriculum of this project curriculum during the 2005 World Symposium on the Environment and Expo at Tokyo, Japan. The project staff developed and publicized mini-awards that funded ten grants to educators for a total of \$193,068. These projects funded the continued expansion of the UAF Science Education Outreach Network, a teacher in-service for 4-H Natural Resource and Youth Development Fisheries, as well as a teacher in-service that supported the development and implementation of a grant writing workshop at Nome, Alaska. Specifically, five of the 10 projects focused on community science outreach: three for science fairs and two community science symposia.</p>	2,5,6

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		Project staff also created a mini-assessment for Alaskan secondary science and math curriculum needs. The analysis from this assessment resulted in the utilization of curriculum funding for training and coursework modification.	
Hispanic-Serving Institutions Education Grants (HSI)		The Hispanic Serving-Institutions (HSI) Education Grants Program awarded more than \$28.2 million in competitive education grants from 2002 until 2007 making 119 awards to HSIs in ten states and the Commonwealth of Puerto Rico. During this five-year period, FY 2002 until FY 2007, over 7,000 students directly benefited from the activities of these programs. The states receiving awards were: Arizona, California, Colorado, Massachusetts, Illinois, New Mexico, New York, Washington, Florida, Texas, and Puerto Rico. There are more than 250 Hispanic-Serving Institutions where Hispanics constitute a minimum of 25 percent of the undergraduate full-time enrollment. These institutions are located in 12 states plus Puerto Rico. Currently, the Hispanic-Serving (HSI) Education grants program is on its 11th year of funding.	Summary
	1	Texas A&M University, Kingsville provided research internships for 26 undergraduate students enrolled at The University of Texas Pan American. Thirty-three undergraduate students from The University of Texas Pan American participated in hands-on research experiences in high-tech molecular techniques. Thirteen students that participated in the Texas A&M University, Kingsville research internship program were channeled to graduate school (100% success rate). Specifically, two students enrolled in doctoral programs. Thirty-three undergraduate students changed their perception of agricultural science. More than 90% of the 33 participating individuals were Hispanic students. Many of these individuals were the first within their family to go to college.	3
	2	The University of Puerto Rico at Mayaguez offered four one-day workshops to 72 high school students as motivational tools to consider careers in the agricultural sciences. Sixteen outstanding students, with guidance from faculty members were provided with the opportunity to participate in research topics of their choice. This hands-on experience offered different challenges within environmental and molecular biology issues related to agricultural sciences. All 16 students completed oral presentations of their research efforts at local, national, or international meetings. These students also presented at three seminars with topics including the environment, molecular biology, and agricultural sciences to agricultural vocational schools in Puerto Rico.	3, 5
	3	A chapter of Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS) at	2, 3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p><u>South Mountain Community College</u> was formed in 2006 with 14 students and four faculty members. The college project staff developed and implemented twelve bioscience courses that could be utilized as transfer credits to four-year institutions. In addition, the college developed three new bioscience research project courses to help guide students through three steps of scientific research. The project at this college produced 44 successful graduates. Six students also successfully completed internships at industry or government bioscience labs with at least two students that completed internships at the local Agriculture Research Service. In 2007, a record 24 Associate of Science degrees were conferred. Eighty-three students received scholarships, research project payments, and/or awards for participation in science competitions and faculty mentoring and tutoring resulted in a 97% completion rate with a C or better among in bioscience courses. Forty-seven Associate of Science graduates from this College transferred to a four-year institution. The Biosciences program was voted Innovation of the year in 2005 by the League for Innovation and Maricopa Community College District because of its fast and steady progress.</p>	
	4	<p>More than 54 HSI projects have been funded to develop, strengthen, and update academic curriculum at the HSIs. For example, the Universidad del Turabo, a four-year institution in Puerto Rico, planned, developed, and implemented pre-entry and retention individualized activities on Nutrition/Dietetics to serve Hispanic individuals from disadvantaged backgrounds. This program is the only the second Nutrition/Dietetics program located in the island with approximately four million citizens. The activities helped a total of 27 students and enabled them to return to their communities to reduce the present nutrition/dietetics shortages and positively impact the health of underserved communities in Puerto Rico.</p>	2,3
	5	<p>Another project at the California State University at Northridge, a 4-year institution, established community service option and an Agro Food course that involved 18 faculty members and three departments. This program has increased the awareness of 124 students in the food system from farm to table, the costs involved and the advantages of organic farming for healthy lives. An estimated 8,000 pounds of vegetables (lettuce, tomatoes, eggplant, cabbage, cauliflower, broccoli, garlic, coriander, basil, oregano, onions, corn, beans, etc.) were harvested from backyard gardens in the last year, which served over 500 people. At least 134 families (an average of 5.5 members per family) in the community learned how to grow vegetables that are not contaminated with herbicides and pesticides.</p>	3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
	6	More than 30 HSI projects have been funded to meet local educational needs in agriculture and coordinating efforts with other institutions and with private industry. Two four-year institutions in south Texas that serve a population with very low income and educational attainment were able to recruit, retain, and graduate more than 33 students of Hispanic descent into undergraduate programs in biology and biotechnology. Participating students increased their investigatory skills in DNA/RNA analysis through applied research opportunities. This experience encouraged all students to complete their degree within biology/biotechnology. Forty percent (13) of these students completed postgraduate studies; 1 has completed a doctoral program in agriculture, while another has entered a veterinary program.	3
	7	More than 75 HSI projects have been funded to build cooperative linkages with state and local USDA agencies. For example, a project in California, a project addressed the needs of the state by supporting the recruitment, retention, and experiential learning activities in agriculture and watershed science. It also improved the high school and community college student transfer rate by developing articulation agreements between the local school district, three two-year colleges, and a four-year institution. Forty-five students entered into the program and participated in internships at local and regional educational organizations and agencies.	3
	8	Over 22 HSI projects have been funded to improve instructional scientific equipment available to students to ensure a well-qualified labor force that meets industry standards and supports the Nation's food and fiber system. For example, the University of Puerto Rico-Mayaguez, a four-year institution, recruited 16 students in the disciplines of environmental and molecular biology and animal science to participate in research experiences using state-of-the-art equipment. All 16 students completed their undergraduate degrees and 14 of them were motivated to complete a Master's program while the remaining two obtained employment in the agricultural industry.	3,4
	9	More than 79 HSI projects have been funded to assist USDA to recruit and retain underrepresented students and increase diversity in the food and agricultural sciences. For example, the California State University at San Bernardino, a four-year institution, increased student enrollment in classes and programs in natural resources and conservation biology, fostered interest and success at entering careers in these fields, and supported curricular changes that will enhance the success of future students in these fields. The Biology Department instituted an undergraduate degree track in Ecology and Evolution, designed to accommodate students with interests in conservation biology and natural resources. Enrollment in the	3,2

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Program Name	#	Description	Area
		Department of Agriculture and Natural Resources at Victor Valley College increased from 559 to 749 students (34% increase) over the period of the grant. Forty-three students were supported in internships, fellowships, and research assistantships. While, at least three students have entered Ph.D. programs in relevant fields, 12 have started careers in relevant fields.	
	10	More than 25 HSI projects have been funded to build institutional capacity at HSI community colleges and four-year institutions. For example, a 2-year institution in Arizona developed an educational program that prepares students for advanced studies and careers in bioscience disciplines and promoted the participation of underrepresented students and increased student enrollment by 43 percent. The project developed and taught 12 bioscience courses and allowed students to easily transfer course credits to the four-year institution. Three of these new courses were related to bioscience research projects to assist students through three steps of scientific research (literature review, proposal writing, and experiment and data analysis). Participating students completed 63 of the bioscience research projects. Due to this rise in interest, the biosciences department grew from four to six residential faculty members and hired one science laboratory technician. Eighty-three students received scholarships from program funding and six students applied for and received internships within the biosciences discipline. During the term of the project, the institution produced 44 successful associate of science graduates in biosciences.	2,3
Resident Instruction Grants of Institutions of Higher Education in Insular Areas (RIIA)		Since its inception in 2005 the \$839,189 was awarded to improve the teaching of agricultural sciences at Insular Area institutions. The majority of funds supported educational equipment and supplies and faculty salaries. Awards averaged two years in duration.	Summary
	1	Funding primarily addresses the eight-institution consortium's (CariPac) need to develop more rigorous agricultural sciences coursework, and to then deliver this instruction over a vast, underdeveloped network of small, technologically-challenged islands. Many of the island's institutions mirror similar educational challenges faced on mainland tribal reservations where culturally, students, if they attend local postsecondary institutions, often are not inclined to pursue agricultural careers or to leave the island for advanced coursework. Funding helps to secure competent faculty who then engage in delivering updated curricula to outlying schools that do not have the expertise to offer a wide range of agricultural science courses. Some coursework has been updated and new faculty are in the process of being hired, however, this	2,4

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		grant program has not yet captured significant impact statements (all awards are still active and have not yet terminated) sufficient to determine measurable advances.	
Higher Education Multicultural Scholars (MSP)	1	<u>Securing a Diverse Food and Agricultural Sciences Workforce:</u> The Higher Education Multicultural Scholars Program awarded a grant to South Dakota State University that supported training Native American students in baccalaureate degree programs: Animal/Range Sciences, Wildlife/Fisheries, Nutrition/Dietetics. Students ranged from freshman to senior in class rank. One student graduated May, 2007 in Biology. Two students completed an international study tour to Africa during summer of 2007. One student presented a paper at the International Society for Range Management with her mentor/faculty advisor. All 10 scholars actively engaged in undergraduate research projects under a mentor faculty member.	3, 5
	2	<u>General Food and Agricultural Sciences:</u> Ten scholars were supported on the 2+2+2 Multicultural Scholars grant in awarded South Dakota State University, in 2003. This grant targeted Native American students, many of whom transferred to South Dakota State University from tribal colleges. This scholarship program supports one Chicano male, also. The students' majors included: Animal/Range Sciences, Wildlife/Fisheries, Nutrition/Dietetics. All students pursued baccalaureate degrees. Students ranged from freshman to senior in class rank. One student graduated May, 2007 in Biology. Two students completed an international study tour to Africa during summer of 2007. One student presented a paper at the International Society for Range Management with her mentor/faculty advisor. All 10 scholars actively engaged in undergraduate research projects under a mentor faculty member. Their understanding of the scientific process deepened and they were aware of cutting-edge research being conducted in their respective discipline. Many of the scholars developed mini spin-off research projects from their mentor's larger research program. One scholar graduated in biology May of 2007. She is pursuing a medical technology certification and will return to her home reservation to work in Nutrition/Healthcare. Two students completed a one-month study abroad experience to Ghana, Africa. Their study tour included eco-tourism and wildlife management. Seven scholars made adequate progress toward degree completion.	3, 5
	3	<u>Training Students from Traditionally Underrepresented Groups Veterinary Medicine</u> Through an MSP award under the FY 2002 program cycle, to Cornell University, five promising students from traditionally underrepresented groups were selected into the Multicultural Scholars program and successfully trained towards their DVM degrees which they received in May 2007.	3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		As a result of the experiences, training, opportunities and support they received, they were poised to become high impact individuals in the field of veterinary medicine upon graduation. Under the award, Multicultural scholars in the program benefitted from a curriculum that was interdisciplinary and featured tutorial based learning in the early years. That innovative feature of the curriculum helped students develop their reasoning abilities and engage in self-directed learning, skills which will be invaluable in their professional lives. The academic program was supported by a highly qualified faculty and state of the art facilities and resources. The scholars had access to academic support services, peer and professional mentoring, counseling and career serves.	
	4	<u>Recruitment of Under-Represented Minority Students for Veterinary Medicine, Public Health, and Animal Disease Research: Promoting Cultural Diversity in the Veterinary Workforce, University of Georgia</u> <ul style="list-style-type: none"> • The cultural diversity of the US veterinary workforce does not mirror that of American society. There also are under-served areas in the veterinary profession for which there is an acute need for more veterinarians to serve society such as food safety, public health, bioterrorism and agroterrorism prevention, biomedical research, and rural practice. • The University of Georgia, College of Veterinary Medicine provided opportunities for underrepresented students to gain experience and pursue training in areas important to agriculture using the mechanism of Veterinary Medical Scientist Training Program (combined DVM/PhD), combined DVM/MPH program, Certificate in International Medicine, and the emphasis in Population Health • Currently five veterinary students hold awarded scholarships. The awardees were African-American or Mexican/American Indian and all seek veterinary training in food animal or public/corporate practice medicine. All the students began their veterinary training in the fall of 2006. One is in the DVM/MPH combined program while another is enrolled in the DVM/PhD program and engaged in avian influenza research. • Through internal funding at the College and funding by USDA, a formal diversity program has been established, and the College of Veterinary Medicine is committed to the effort. 	3
	5	<u>Utilization of Multicultural Scholars as Leaders in Recruitment and Mentoring Programs, Cal Poly, San Luis</u> <ul style="list-style-type: none"> • The Multicultural Agricultural Scholars Program (MASP) targeted students for enrollment in 	3

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Program Name	#	Description	Area
		<p>one of 18 majors in our College of Agriculture, Food and Environmental Sciences providing support to the scholars through faculty academic advisors, student peer advisors, mentoring programs and various student organizations focused on cultural diversity. Scholars were also involved in outreach and recruitment efforts of the college to enhance interest and increase applications for admissions from underrepresented student populations. To enhance successful entry into professional careers or graduate programs in the chosen fields, opportunities were identified for scholars to participate in internships and co-ops, research and creative projects, and other career related experiences.</p> <ul style="list-style-type: none"> • Cal Poly has successfully recruited four cohorts of MASP scholars into the College of Agriculture, Food and Environmental Sciences. The students have represented many programs including Agribusiness, Agricultural Education and Communications, Crop Science, Animal Science, and Nutrition. Students were assigned faculty academic advisors and encouraged to meet once or twice every quarter. Faculty advisors guided the students in curriculum issues, professional career options, internship/co-op advising, and other opportunities. • Scholars gained knowledge and technical competencies and recruited others by sharing knowledge gained. • The scholars also served as role models in recruitment efforts, serving as speakers for campus recruitment events for high school students. The most recent cohort of MASP scholars to graduate included students in the following majors: Animal Science, Agribusiness, Crop Science, Nutrition, Nutrition. 	
		<ul style="list-style-type: none"> • Cultivating leadership opportunities and engaging students in career related opportunities proved to be tremendously successful in launching students into career paths of their chosen agricultural-related major. 	

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Program Name	#	Description	Area
	5	<p><u>The Natural Resources Multicultural Scholars Program at The University of Vermont – The Rubenstein School of Environment & Natural Resources, Burlington, Vermont</u></p> <ul style="list-style-type: none"> <li>• The Rubenstein School of Environment & Natural Resources (RSENR) at the University of Vermont (UVM) recruited and trained African, Latino, Asian, and Native-American (ALANA) high school students, because these populations are underrepresented in environmental and natural resources disciplines. <li>• The curriculum transformed by infusing multiculturalism throughout, including a six-credit diversity requirement for graduation. <li>• Faculty and staff provided mentorship to the Scholars through active advising, exposure to internships (relevant to their field of study and often with natural resources agencies or organizations) and research programs like the McNair Scholars Program geared to pipeline multicultural and first-generation students into programs for graduate education. <li>• The UVM Communications Office wrote and distributed an article about the success of RSENR in receiving grant funding through the USDA, CSREES' MSP and the NNF programs as well as the establishment of the Donald H. DeHayes Multicultural Scholars Endowment Fund. <li>• Three RSENR Multicultural Scholar alumni have completed advanced degrees: <ul style="list-style-type: none"> <li>○ Brandeis University MBA in Sustainable Development, May 2006 <li>○ Touro College, Masters in Special Education and general education (Grades 5-9), December 2005 <li>○ Master of City Planning, San Diego State University, May 2006 <li>• Scholars alumni are currently employed in the following positions: <ol style="list-style-type: none"> <li>1. Roux Associates, Project Manager and Emergency Responder, Environmental Consultants Americorps VISTA Volunteer, Center for Community and Neighborhoods <li>2. The Child School (Special Ed), Head Teacher (8th grade) <li>3. David Evans & Associates, Environmental Planner <li>4. City Parks Foundation, Education Assistant 	3

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Program Name	#	Description	Area
		5. Admissions Counselor, Daniel Webster College 6. Pepsi Cola Bottling Co., Accounts Payable 7. Alliance for Rural Community Health (ARCH), Health Advocate Event Associate, Shelburne Farms	
	6	<u>Increasing the Numbers of Under-Represented Students in the Department of Food Sciences, The Pennsylvania State University, State College, Pennsylvania</u> <ul style="list-style-type: none"> • A cohort of underrepresented future food scientist is being trained to assist in solving homeland security issues related to food safety. The success of the MSP participants will help recruit other young underrepresented potential food scientists. • All of the students received additional financial scholarships and awards to help defray tuition cost. • Each fall, scholars participated in a USDA and/or EPA internships in Washington and gained real world experience in real world problem solving. • Through this program, Scholars have developed leadership: One Scholar received the following honors and awards <i>Honors</i> <ul style="list-style-type: none"> • Dean’s List • Bunton-Waller Fellowship Scholar <i>Awards</i> <ul style="list-style-type: none"> • USDA Scholar • A. Harman Trustee Agriculture Scholarship • Penn State Alumni-Michigan Chapter Scholarship Winner • Centennial Student Aid Award Winner • Academic Competitiveness Grant Recipient • Michigan Merit Award Winner • Elks Club of Troy scholarship award winner • 2nd Place- Michigan Congressional Art Competition 	3
	7	American Indians experience rates of major causes of death including heart disease, cancer, diabetes and obesity that exceed the rates for Americans overall. Poor nutrition practices are at least partially responsible. There is a national shortage of American Indian dietitians and	3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p>nutritionists who are well trained and culturally sensitive to address this national health problem. In the 2005 program cycle, an award was made to the University of North Dakota to increase the number of well educated, culturally sensitive American Indian dietitians and nutritionists. In particular, the project is facilitating the education of nutrition professionals who have a commitment to serve the Native American communities through continued development and implementation of the University of North Dakota Multicultural Scholars into Dietetics Program. The long term goal of the MSDP is enhancing the overall health and well-being of American Indians through increasing the number of highly qualified nutritional health professionals who understand the needs, issues and unique cultures of Native peoples. Ultimately, the project should increase the diversity of students within the department and university and provide opportunities for greater cultural competence of all students and faculty. One scholar (freshman) was selected for a new student community support program whereby the students live together in a residence hall, participate in community building activities and attend specialized programs to facilitate student retention. Within the department, scholars met at least twice/month with their faculty mentor though out the year and several times/year with mentors from UND American Indian Student Services for direction, support and assistance. All scholars received University of North Dakota Cultural Diversity Tuition waivers as their matching for the USDA grant. A new recruitment brochure was developed and the MSDP website was revised. Additional planning for more recruitment visits to Indian reservations in the upper plains to enhance recruitment will be continued.</p>	
International Science and Education Competitive Grants (ISE)	1	<p>Recognizing that the U.S. seed industry is now an international industry, Ohio State University (OSU) used an ISE award to develop a global seed technology curriculum for U.S. students and industry employees. Working with educational institutions in Chile and Bolivia, as well as Alabama A&M University, they established undergraduate and graduate curricula utilizing distance education technologies such as videoconferencing, DVDs and podcasts. Classes have been taught in the three countries on International Seed Production, Seed Physiology, and Seed Science and Technology. The project was built on the premise that seed technology taught from a single institution perspective fails to take advantage of the environmental and cultural diversity derived from engaging universities in other countries. It also enabled faculty at OSU to draw upon some of the world's leading academic programs in seed technology. Students were also exposed to current issues facing the seed industry today through collaborative work with</p>	1, 2, 6

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		industry officials in the U.S and abroad.	
	2	Virginia Polytechnic Institute and State University (Virginia Tech) built upon an existing relationship with the University of the Free State (UFS) in South Africa to expand opportunities for research, teaching, extension and student exchange. The university developed new study abroad courses, helped establish an International Study Center at UFS to facilitate exchanges with Virginia Tech, and began an international student internship program. In January, 2007, Virginia Tech sent a group of 15 undergraduate students to South Africa for a semester of study. These students returned with a broadened outlook and a more expansive knowledge of agriculture and agricultural practices. They also have a better understanding of international issues and heightened cross-cultural awareness. Virginia Tech faculty participating in this program have also acquired new knowledge in such areas as plant disease management and forestry in dry-land environments. UFS draws students from throughout the African continent, thus exposing Virginia Tech students to issues, problems and opportunities in several countries. As these students come for coursework in the U.S., they also bring an international dimension into the agricultural science classes they attend. With the continued development of the study center and more collaborative research initiatives, Virginia Tech anticipates that they will be able to include more of their graduate students in the future.	1, 2, 3
	3	Recognizing the need to better prepare tomorrow's graduates to succeed in a globally interdependent world, Kansas State University received an ISE award to strengthen the international dimension of their graduate and undergraduate curriculum. With funding from CSREES they have included modules from Uganda, Lebanon and New Zealand in their "Comparative Food and Agricultural Systems" course. The course curriculum has already been shared and implemented at the University of Florida; Auburn University and the University of Arkansas are considering including the course in 2009. Through the course modules, students are learning the financial, economic, political, agronomic, meteorological, topographical, and animal husbandry advancements and constraints of each economic region relative to the import and export of food and food products.	2, 6
	4	Purdue Extension was awarded an ISE grant to create a new international course that incorporates a travel and research opportunity. It is a two-part program designed to increase cross-cultural understanding and agribusiness networks between Indiana and Central America. Innovations in distance education have been used by Purdue University to develop and deliver	2

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		two three-credit courses on “International Education and Engagement.” During the spring 2006 distance education course, participants learned the importance of cross-cultural understanding, building relationships with Indiana agribusinesses and market research. The project includes an experiential learning experience in Costa Rica that also involved participants from extension and Indiana agribusinesses. Each participant represented an Indiana business as a market researcher and conducted research for that company using skills obtained in the spring course. Additional	
		impacts include the strengthening of Purdue’s ties to the agribusiness community; enhanced knowledge concerning trends in international markets and trade; and, through presentations at 4-H clubs, an appreciation among youth for international agriculture and diverse cultures. This project is strengthening the global competence of students, faculty, and staff in agriculture and related areas, and it is improving Purdue University’s capacity as an institution to contribute to agribusiness competitiveness.	
	5	Faculty in West Virginia University (WVU) Division of Forestry and Natural Resources received a 2006 ISE award to improve global competency of WVU’s forestry students and faculty. The purpose of the grant is to revitalize an international sustainable forestry curriculum at WVU. The project includes field experiences in Ireland, India and the Philippines; an International Forestry Colloquium featuring speakers from local forestry business community, government agencies, and international collaborators; and a global forestry course. Ultimately, the project aims to provide a strengthened awareness of globalization in forestry, employment opportunities for students in international forestry, and the potential for professional and personal growth in working with diverse cultures so that forestry students can be more competitive as professionals in international forestry markets.	2
1890 Institution Capacity Building Grants (CBG)		Several grants as well as 1890 Facilities grants were awarded to improve enrollment, graduation rates; entry into employment; and improve college facilities with modern labs, computers and networks. Now at several 1890s, faculty members have access to GIS software for research work and infused GIS curricula at partner Institutions. Six web-based courses were created and approved and five schools began teaching GIS in 2006 and 25 students enrolled in Fall 2006. To increase the number of students from traditionally underrepresented and/or underserved groups in the biotechnology field, the program awarded 50 student scholarships in biotechnology and biodiversity or related programs. It also supported 23 interdisciplinary biotechnology seminars, 50 independent student research projects and 15 Biotechnology workshops for middle and high	Summary Outcomes

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		school students. The project also supported two master's degree programs in Biotechnology.	
	1	North Carolina A&T University received an award to establish an <u>Agribusiness Enterprise Resource Center</u> . Through the Center, courses and curriculum for the Master of Business Administration (MBA) degree in agribusiness were developed. The Center also provided Entrepreneurship for interested students.	2, 3
	2	Another Master's degree program in Business Administration was established at South Carolina State University (SCSU). This degree program provides opportunities for students from traditionally underrepresented and/or underserved groups to be pursuing high-level managerial positions in the agribusiness sector. The South Carolina Commission on Higher Education approved the MBA degree at SCSU that began in the Fall Semester of 2005 with concentrations in Agribusiness and Entrepreneurship. In addition, an <u>Agribusiness Enterprise Resource Center</u> is being developed. The MBA degree program in agribusiness provided an opportunity for about 15 to 20 students to train for higher-level managerial positions in the agribusiness sector.	2, 3, 5
	3	Provided funds for the development of <u>Food, Agriculture and Natural Resource</u> curricula, degree programs and concentrations at several 1890 land-grant institutions. Food safety and food science programs have been established at the University of Maryland, Eastern Shore, Alabama A&M University, and Fort Valley State University.	2
	4	Provided funds to a number of the 1890 land-grant institutions to establish or strengthen their international cooperation and introduce an international component to curricula and degree programs. Delaware State University (DSU) developed the first course for credit with international dimensions. About 27 students have completed the course, which is taught in South America. The funding assisted DSU with policies in international education and at least nine other courses, with international content, are now being offered at DSU.	2, 5
	5	Awarded a number of grants to support five workshops that provided training opportunity to high school students, two courses were developed in <u>Geographic Information System (GIS)</u> and one included general education courses at Virginia State University. In addition, grants provided stipends for workshop participation and training of 42 high school teachers.	1, 2, 3, 5
	6	Several applications were funded in aquaculture research as well as teaching. Kentucky State University (KSU) is one of the lead institutions in this field. Most recently, a new aquatic biology course was approved and is included in KSU's catalog with seven students enrolled in 2007. In addition, two or more online courses in aquatic biology were developed. They	2, 3, 4, 5

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		established an <u>Aquaculture Center</u> . The Center is integrated into the agricultural science programs curricula and 27 students have taken the first two courses. The Center has received software and hardware upgrades to be able to handle more sophisticated research and training. The Center is being used by graduate students in their thesis work.	
	7	At Florida A&M University, a Master's program was developed in environmental studies and 16 students participated in a curriculum showcase event in the area, four students participated in a four-week internship at Florida State University, 11 faculty from 1890 and 1862 participated in a think-tank session, a number of faculty members participated in a leadership academy at Iowa State and other 1862 institutions.	1, 2, 5
	8	The program has supported food and agricultural sciences intellectual capital development for the 1890 land-grant institutions, the communities served, and the nation with course development in biotechnology and biodiversity incorporating geographic information system (GIS) technology and applications to real world food and agricultural sciences; leveraging resources and forming alliances including with ESRI, USDA-ERS and other public and private entities to build physical and intellectual capacities. New degree programs that advance workforce proficiency of graduates (with Bachelor's and/or Master's degrees) from 1890 institutions being more scientifically proficient; knowledgeable of agribusiness and entrepreneurship (South Carolina State University); increased numbers of high school students benefitting from teacher professional development through participation in summer workshops and seminars delivered by 1890 institution; increased enrollment in environmental science by high school students; potential for positive contribution to scientific to workforce. There has been enhanced global competency in students, faculty and staff when 3,412 students gained new knowledge from nine courses that now offer international content in curricula (Delaware State University).	1,2,3,6
	9	At Prairie View A&M University a teaching project contributed to a Center for Biodegradable Polymer Systems. This is a multidisciplinary program combining basic and applied research with educational programs. Four Agriculture majors at Prairie View A&M University, participated in the program for 10 weeks during the summer of 2005. Orientation began on May 31 and students were introduced to their research mentor. Mentors met with their students for an hour discussion every week in addition to working closely with students on a daily basis. At this meeting, participants discussed their projects, specifically the rationale, methods and expected	3,5

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p>results. These meetings were focused on the progress and/or problems in research projects. Fieldtrips were taken to the Genome Center at Baylor College of Medicine, NASA Johnson, USDA in College Station. Students have presented their work at ABRCMS in Atlanta, Georgia and the local symposium held at Prairie View A&M University. Students will also present at MANRRS. Since the project is focused on biodegradable polymer systems, chitosan has been enzymatically degraded to give low molecular weight fractions. Studies are being performed to determine if chitosan decrease the growth rate of ovarian cancer cells.</p>	
	10	<p>The Project to Strengthen Biotechnology Program was awarded in 2003 to North Carolina State A & T University (NCATU). The project is a good example of an award being used to address a shortage of well-trained biotechnologists in a growing field. Through the use of merit-scholarships and enhanced laboratory experiences for students and faculty through infrastructure enhancements and library acquisitions. The emphasis on faculty development in the area of biotechnology is particularly important. Students are attracted to cutting edge programs specially those connected to the latest developments in the private sector. The project also included faculty from middle and high school science programs to ensure that students are both exposed to this new field and have the basic competencies to get accepted and to compete. The project was also broad in scope as 50 students with a GPA of 3.5 and higher was awarded scholarships. Selected students were engaged in a rigorous program of selected course work, faculty mentored research projects, and workshops by outside private sector experts. The project plans to build on this success by developing an MS degree program and a center for biotechnology and biosciences.</p>	1,3,5
<p>National Needs Graduate and Postdoctoral Fellowships Grant (NNF)</p>		<p>Participation in the higher education for the food and agricultural sciences enterprise was enabled with stipend and scholarship support for student training. The education portfolio has 2 traineeship programs: (i) the Food and Agricultural Sciences National Needs Graduate Fellowship (NNF) Grants Program and (ii) the Higher Education Multicultural Scholars Program (MSP). Respectively, during the period covered by this review, 186 scholarships totaling \$4,572,000 and 323 stipends for graduate level training with 102 students supported with International Research Dissertation/Thesis Allowance (IRTA) in the amount of \$17,395,243 were awarded. One hundred and 62 news students entered baccalaureate degree programs, 24 students were supported in Veterinary Medicine degree programs, 65 students entered Master’s and 258 doctoral level graduate programs in food and agricultural science</p>	Summary

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		discipline.	
	1	The program supported the first graduate training program in the <u>Sciences for Agricultural Biosecurity</u> - at Oklahoma State University. The program has produced the first group of two M.S. and two Ph.D. level graduates in the U.S. to be trained in agricultural/plant pathogen forensics. Their placement in the nation’s Biosecurity enterprise has been an important impact.	3
	2	The program has been responsive to evolving national needs for supporting projects that develop graduate students, including those from groups traditionally underrepresented or underserved in the food and agricultural sciences. During the period of this review, with an expenditure of over \$17 million, there were 65 graduate students supported at the Master’s and 258 at the doctoral degree levels in areas of expertise need. Support was made to provide 102 opportunities for National Needs Fellows to participate in International Research Dissertation/Thesis Travel Allowance, totaling more that \$17,000. Student knowledge increased to address national issues such as where high technical competency is needed to contribute in critical areas of human nutrition, specifically obesity and health; integrative training to address issues of environmental sustainability, ecohydrology and application of genomics technology to foods for health, plant breeding and animal sciences. In 2005, this grant program supported training in the University of Florida’s professional degree – Doctor of Plant Medicine where graduates have been impacting workforce competency in the area of agricultural biosecurity with employment with USDA-APHIS.	3
	3	<u>Training Doctoral Students to Meet Workforce Needs in Forestry</u> In a 2006 award, recognizing that the forest products industry is in decline in the United States, The Pennsylvania State University successfully proposed a graduate training project to apply nanotechnology to wood and fiber engineering and other bio-based products. Students are being trained to garner the skills and experience necessary to develop innovations that revitalize the forest products industry. The grant provided stipends for three Ph.D. students, each of a three-year duration. Penn State University is providing two matching Ph.D. assistantships, also each of three-year duration, plus the University committed to provide a fourth year of coverage for each of the USDA funded fellows. In all, five Ph.D. students will be trained through a federal investment of stipend support for three doctoral students. Each student will complete a dissertation on a project relating to nanoscale engineering and renewable forest-based materials. The roadmap for the Forest Products Industry outlines a clear need for scientists trained in nanoscale engineering and	3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		renewable materials. The marriage of these two fields will lead to increased economic opportunities within the United States. Our project will provide a group of well-trained employees to nucleate this emerging sector of the economy. The Project Director for this award is a former fellow supported under the National Needs Graduate Fellowships Program [Ph.D., Virginia Polytechnic Institute and State University (2004)].	
	4	<p><u>Training Master's Students in Sustainable Sciences</u> A new generation of agricultural professionals is needed, empowered with an integrated understanding of policy, agricultural sciences, production agriculture, food systems analysis, and environmental resource management. The Agriculture, Food and Environment (AFE) Program within the Friedman School of Nutrition Science and Policy at Tufts University successfully received funding, in the 2006 program cycle, for a uniquely designed graduate program to train this new generation of leaders. The mission of this training approach is to educate students to evaluate the environmental, political, economic and social aspects of food production and distribution. As such AFE is well suited to fulfill the needs of the CRSEES Targeted Expertise Shortage Area (TESA) for Training in Sustainable Sciences, Discipline Area G: Interdisciplinary, Sustainable Food, Agriculture and Environmental Sciences, Social Sciences and Economics Graduate Degree Programs. The Agriculture, Food and Environment Program is using the award to train four Master's level graduate students. By graduation, AFE students would have developed a foundation in agricultural systems and research methods so that they have the language and knowledge base to work collaboratively with agricultural scientists to develop environmentally sound production systems. In addition to science and research skills, students would have developed a comprehensive understanding of policy and attain practical experience in the field. Graduates develop a diversity of skills from learning to use the Agricultural Census, to developing a nutrient budget, to maneuvering their way through the legislative process, to decoding dietary guidelines. Additionally, graduates have a historical context in which to place current agricultural and environmental issues; they have a strong grasp of past trends in agriculture and key current legislation used to regulate and support agriculture. The success of AFE alumni best speaks to the ability of the program to produce outstanding graduates. Throughout the country AFE alumni are in the forefront of the field contributing in key areas such as agricultural education, farm-to-school and farm-to-healthcare programs, and sustainable business practices. Recruiters regularly contact AFE Program Director when seeking potential</p>	3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		employees. Currently, the demand for AFE graduates outstrips the supply. Upon graduation Fellows will join AFE alumni taking on challenges in the following fields: (1) Educators developing sustainable agriculture and environmental science curricula; (2) Non-profit sector professionals working on campaigns such as buy local and fair trade; (3) Private sector professionals addressing issues of corporate social responsibility; (4) Policy analysts for biotechnology, industrial farming issues, and sustainable agriculture; (5) Staff for organic food companies and the USDA National Organic Program; (6) Consultants and staff for state agriculture and public health agencies; (7) International development field staff for donor agencies and the United Nations; and (8) Agricultural entrepreneurs, farm owners and farmers.	
	5	<p><u>Training in Human Nutrition</u> University of Illinois was awarded a grant to focus on the next generation of nutrition scientists must be equipped with the skills to solve the complex nutrition and health research questions of the 21st century, which often transcend a single discipline. The Nutritional Sciences graduate program at the University of Illinois provided doctoral candidates with expertise in nutrition, coupled with knowledge and research experiences in other relevant disciplines. The USDA NNF program provided an exceptional opportunity to bring focus to interdisciplinary questions.</p> <ul style="list-style-type: none"> • A 2002 NNF grant highlighted the need to train students in the application of genomics and post-genomic approaches to macronutrient metabolism. The University of Illinois has an international reputation for research on dietary bioactive components and there is enormous consumer interest in this area • The 2005 NNF grant focused on soy and human health. • The themes of the NNF grants provided a focal point for the development of courses, which benefited all students in the program. • In support of our 2002 NNF grant, faculty developed five-week courses entitled “The Application of Gene Microarrays to Nutrition Research”, “Setting the Nutrition Agenda in Nutritional Genomics – Genomic and Post-genomic Methodologies” and “Stable Isotope Applications to Nutrition Research - Proteomics”. The microarray course was taught in conjunction with the Biotechnology Center and that module, and the stable isotopes module, involved hands-on experiences. • For the 2005 NNF training program, faculty developed five-week modules on “Soy and Human Health” and “Regulatory Aspects of Dietary Bioactive Components”. In summary, 	2,3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p>the Division of Nutritional Sciences has effectively utilized the USDA NNF program to provide cross-disciplinary education and research opportunities for exceptional predoctoral fellows and as a means to impel the continued improvement and evolution of the graduate program.</p> <ul style="list-style-type: none"> • One Fellow was selected to attend the meeting of Nobel Laureates in Lindau, Germany, July 1-6, 2007 	
	6	<p><u>CSREES-USDA National Needs Master's Fellowships In Biosecurity And Integrity Of The Agribusiness And Food Supply Chain</u> Texas A&M University was awarded a grant to devote more intense attention to the threat of deliberate contamination of the food supply chain, leading to actions in the new field of "food defense."</p> <ul style="list-style-type: none"> • Both public and private sectors indicate an urgent need for analytical capability, particularly risk assessment, to address the challenges of biosecurity and integrity of the food supply chain; • Educate students to evaluate the environmental, political, economic and social aspects of food production and distribution. • Increasing reliance on off-shore sourcing of ingredients and products from China has resulted in a small percentage of the total import trade failing to meet U.S. food and feed standards and non-consumable product standards, particularly for lead residues. <p>Graduate training of 2 Masters of Agribusiness students resulted in National Needs Fellows:</p> <ul style="list-style-type: none"> • performing high-quality decision analyses associated with threats to the integrity of the agribusiness and food supply chain; • gaining exposure to team-based learning processes that enhance their cognitive and affective skills in a business or policy-making environment; • gaining enhanced abilities to communicate effectively and to demonstrate sensitivity to cultural, gender, generation/age, and academic diversity; • developing professionalism and engagement with experts in the discipline by participation in the intercollegiate and multidisciplinary centers and institutes that engage 	3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p>graduate students and faculty in common agendas.</p> <ul style="list-style-type: none"> • Developing thesis based on knowledge of the economics of food ingredient functionality, quality, safety, assurance and traceability; • A linear programming model was constructed to incorporate transportation costs as well as variable costs at pasteurization treatment facilities added into the complexity of economic analysis. The 'one size does not fit all' environment of managing risk associated with biosecurity and integrity of the supply chain requires case based analysis to create sound public policy decision-making. • Gained expertise in analyzing unintentional and intentional contamination of the agribusiness and food supply chain; • Understanding of issues relating to the economic and political drivers influencing the creation of new market institutions and governance structures, both public and private, and the attendant policy and regulatory processes that influence both intra- and international agribusiness and food trade • Training excellence was recognized: One Fellow was awarded a student scholarship by the International Agribusiness Management Association to attend their annual meeting in Parma, Italy – 2007 summer. • Their skills in conflict resolution were enhanced through the accomplishment of research objectives using the teamwork approach. <p>It is expected that:</p> <ul style="list-style-type: none"> • personnel entering the workforce with intellectual capacity to evaluate the environmental, political, economic and social aspects of food production and distribution; • MAB Fellows uniquely qualified to enter doctoral programs with fields in food and agribusiness managerial economics, supply chain management, or finance; • one NN Fellow, who graduated from this program, currently works with USDA – ERS. 	
	7	<p><u>The Emerging Discipline Of Agricultural Microbial Forensics</u> Oklahoma State University</p> <ul style="list-style-type: none"> • The critical need, identified by federal agencies, for research and personnel experience in forensic science related to US plant resources (crops, forests, rangelands) requires a strong national agricultural biosecurity plan must include microbial forensics and criminal 	3,5

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p>attribution. Students trained in Agricultural Biosecurity will make significant contributions in securing the nation. National Needs (NN) Fellows will participate in experiential learning opportunities that will allow them to form a professional network among FBI scientists that will be invaluable in advancing their training in the discipline, creating the potential to develop future collaborations, and providing opportunities for pipelining into career positions in forensic plant pathology within the FBI Laboratory or other forensic laboratories in the defense community.</p> <ul style="list-style-type: none"> • Fellows are being trained to gain technical competency in testing and the applicability that the new reports indicating that mRNA may not degrade as rapidly as previously thought. The ability to detect mRNA in body fluid stains is important because it can facilitate the identification of the stain source at a crime scene and procedures may be translatable to plant systems. • Training students for M.S. and Ph.D. degrees with CSREES funding at \$247,500 -included an allowance for experiential learning opportunity gained knowledge about forensics-related careers in the FBI; Learned about ongoing research programs and future positions related to APHIS Select Agents and the use of BSL-3 containment; Learned about ongoing research programs and future positions related to the Department of Homeland Security mission; Learned about the National Plant Diagnostic Network and biosecurity research requiring containment and high-level regulation; • Scientists at OKSU established an interdisciplinary, cross-departmental graduate program designed to provide students with knowledge, training and experience in the scientific disciplines and law enforcement issues necessary for a career in agricultural microbial forensics. • NN Fellows investigated the stability of the RNA over time and in the environment at facilities: (1) the USDA Agricultural Research Service Plant Pathology Laboratory at Fort Detrick, MD, which is the only U.S. site at which research on BSL-3 plant pathogens can be carried out, (2) the Department of Homeland Security’s National Bioterrorism and Countermeasures Center at Ft. Detrick, MD, (3) the National Agricultural Biosecurity Center at Manhattan, KS and (4) to conduct hands -on research in the FBI Forensics Laboratory at Quantico, VA – all resulting in enhanced knowledge gain • Hands-on research in the FBI Forensics Laboratory at Quantico, under direction of FBI 	

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		<p>Forensic Scientist and Postdoctoral Fellow; Meeting with and interviewing FBI agents and scientists; Networking within the Security Community; The study evaluated the stability of messenger RNA in bodily fluid stains.</p> <ul style="list-style-type: none"> • Future U.S. Biosecurity preparedness has been enhanced by the training of NN Fellows in the blended discipline of plant pathogen forensics. 	
	8	<p>Sustainable and socially responsible agriculture and food systems are a growing concern in Ohio and throughout the U.S. An award, in the 2006 program cycle, to The Ohio State University, created an interdisciplinary graduate training program in Rural Sociology for four (4) Master's level students trained in the TESA, Training in Sustainable Sciences for Food, Agricultural and Environmental Systems with the goal of gaining a broader theoretical and applied understanding of these systems. The institution supports an additional two students for a cohort of 6 Fellows, within the Social Responsibility Initiative (SRI). This interdisciplinary training opportunity, based on the Ecological Pyramid, consists of four dimensions - social responsibility, economic viability, production efficiency, and environmental compatibility leading to the development of scholars able to meet the national demand by academia, industry and government for experts with integrated training in all of the aforementioned dimensions of food and agricultural systems. The Master's degree fellowship focused on training skilled, engaged, committed scholars who, on graduation, will make use of and contribute to the food and agricultural system by engaging in basic and applied interdisciplinary research, policy making, and analysis. Training is targeted at two primary audiences: those wishing to pursue a career in food, agricultural, and environmental sciences; and those wishing to do further academic study and research on these topics. The first phase of the project included dissemination and announcement of the fellowship opportunity on various professional food, agricultural, and environmental sciences list-servs, through professional networks and in several publications. There were approximately 20 inquiries and applicants during the first phase of recruitment. Two Fellows (1 from an underrepresented group) were selected and started their graduate training program in the sustainable sciences. Fellows successfully completed two core courses toward completion of their degree requirements. These core courses helped to develop a better theoretical understanding of sociology, rural sociology and environmental sociology in relationship to the sustainable sciences. Fellows participated in a learning group related to local food and farming.</p>	3

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Program Name	#	Description	Area
		A more applied understanding of the food system and a library resource databank on community food system assessment resulted. The databank on community food system assessment is accessible on the SRI website [http://sri.osu.edu/programhighlights_outreach.php].	

Target Areas: 1. faculty training & development; 2. curriculum & new program development; 3. recruit, retain, train & graduate students prepared to enter the workforce; 4. instructional materials, equipment & facilities; 5. teaching methodology including experiential learning; 6. collaborative & integrative programs

Table 4: Proposed NPL Program Roadmap

ELEMENT A - NETWORK and COLLABORATE

1. Encourage partner institutions in developing focused strategic plans that integrate USDA goals with local problem solving

Current Status

- In selected RFA's only
- Varying degrees of strategic plans at partner institutions
- NPLs are engaging our institution partners in addressing the need for strategic planning
- Activities in this area are sporadic and uncoordinated

Examples

- HSI Texas Consortia are working on this
- Tribal Colleges strategic plan collection was done 3 year ago
- ANNH Univ. Hawaii System consortium project on their way with strategic plan
- Some 1890, ANNH and HSI are working on developing plans
- 1994s and ANNH institutions are being encouraged and trained to use the logic model to develop impact statements.

Needs and Recommendations

- Two-way communication between SERD and ACOP, ESCOP, ECOP and ICOP
- Add web resources
- Address small institutions' needs through linking of strategic plans with USDA goals
- Collect and track strategic plans from our partner institutions

2. Expand the effectiveness of SERD programs by participating or collaborating with other federal agencies, including USDA, private organizations and professional societies

Current Status

- Working with HSI initiatives in other agencies and organizations i.e., NACTA, and AAHHE
- New PD Meeting Presentation
- Some grant awards encourage USDA Collaboration
- Discussions with Department of Education on tribal colleges student needs

Examples

- PD Conferences that involve other federal agencies (ARS, NARCH and NSF)

Needs and Recommendations

- Determine which agencies, organizations and professional societies are important to our core mission
- Engage with external agencies and organizations in a prioritized and coordinated fashion
- Elevate NPL participation to a higher level
- Develop web links with outside activities

3. Institutional enhancement and capacity building

Current Status

- Grant programs in SERD

Examples

- ANNH-U Hawaii system consortium project on their way with strategic plan

Needs and Recommendations

- Strengthening and enhancing with well qualified faculty and state of the art equipment
- Strengthen connection among grantees towards common interests and agency need areas
- Develop a SERD Strategic Plan
- Develop systems that use IT to address obstacles, training needs, development of realistic timeframes for project implementation, and adherence to project planning, implementation and evaluation methods
- Facilitate partnerships between and among all the designated Land Grant institutions
- Address on-going professional development needs of partners and grantees to assure continued success of programs
- Maintain updated web site with resources for applicants

4. External Communications

Current Status

- No formalized plan
- CSREES supporting Indian Country Extension website (ICEWEB)
- Initial conversations with eXtension, but no formal plans for follow up

Examples

- HSI New PD's meeting posters on the Web
- 1890 and 1994 Research PD Conference poster display resulting in increased awareness of present and future issues needed to address community, state, country and global problems and challenges

Needs and Recommendations

- Develop and manage effective communication pieces, including high quality web pages, presentations and impact reports
- Pursue further SERD program involvement and support with existing mechanisms such as ICEWEB and eXtension
- Recognize special events, such as the 25th anniversary of National Needs Fellowship program (2009); 15th anniversary of the 1994's (2009); the 20th anniversary of FRTEP (2010); 1890 Capacity (2009) and 10th anniversary of 1994 Research (2009)
- Promote resources to develop and maintain directories and emailing addresses

ELEMENT B - PROGRAM DEVELOPMENT

1. Ensure globally aware and internationally engaged institutions and communities through research, education and extension

Current Status

- International Science Education (ISE) program
- Priority area in several SERD RFA's
- Food and Agricultural Education Information System (FAEIS) Data collection

Examples

- FAEIS Data—Enrollment, Degrees, Placement, Faculty and International Programs
- CBG and Challenge Grants fund international projects and others allow international focus
- Tribal college expertise applicable to international development projects of USDA

Needs and Recommendations

- Consistency and compatibility across CSREES RFA's
- Communication with FAS and other agencies
- More engagement by IP for including globally-focused programs in SERD and across CSREES
- Determine how to tap knowledge and experiences of minority communities, e.g., indigenous knowledge of tribal communities in addressing global issues

2. Workforce Development

Current Status

- Grants aimed at producing trained qualified personnel
- Capacity Building through all SERD Grant Programs
- Employment Opportunities Report on workforce needs – every 5 years
- Living Science Brochure for student recruitment
- FAEIS data available for program development and analysis
- No concerted SERD-wide effort to address the needs of USDA Agencies

Examples

- Review ANNH impacts to determine whether educational enhancements were actually made due to utilization of SERD award funds
- SERD NPLs encourage institutional and faculty information sharing and best practices through use of conference calls, workshops, conferences and attendance at professional meetings

Needs and Recommendations

- Understand and appreciate workforce needs across the national spectrum
- What does 'workforce development' actually mean and how important is it?
- Assess specific employer needs across the Nation in addition to USDA agencies' employment needs
- Develop plans to evaluate, identify and assess gaps
- Long-term and historical evaluation needed to identify extent to which grants have had an impact on the needs
- Focus on K-20 programs
- Web links with Bureau of Labor Statistics and National Center for Education Statistics
- Address the needs expressed in the USDA's Human Capital Plan, Succession Plan, and 20 Mission Critical Occupations as well as emerging critical issues
- Explore cultural hurdles to improving workforce development in various populations

3. Human Capital Development

Current Status

- Input - i.e., scholarships, fellowships, IPA's, internships
- Ag in the Classroom
- Extension Programs
- Workshops
- USDA Faculty and Student Team (FAST) Program collaboration

Examples

- National Needs, Multicultural Scholars and IPA's
- Promoting use of distance education in SERD programs
- Consortium projects encourage faculty sharing of resources and experiences, student interns and exchanges, publications, etc.

Needs and Recommendations

- Better integration of education, extension and research to address human capital development
- More collaboration in programs with other institutions
- Better utilization by SERD of IPA's and 1890 scholars

4. Solving individual and community needs

Current Status

- Issues relate to USDA and CSREES strategic plans
- Some HSI projects build capacity to address local and regional needs

Examples

- “ A DASH of Aloha ” book of health recipes distributed to 5,000 patients and 5,000 copies sold at campus Farmer's Market to fund health and wellness initiative
- Regional Integrated Pest Management (IPM) centers are assisting Indian Country in addressing problems associated with Rocky Mountain Spotted Fever

Needs and Recommendations

- Work to address specific priority issues. For example, what resources are needed in addressing water usage in Western communities; what role do minority-serving institutions play in addressing bio-fuels research, extension and teaching; how better to connect minority-serving institutions with regional programs
- Need to better identify emerging issues and address in RFAs

ELEMENT C - ADMINISTER AND MANAGE PROGRAMS

1. Elevating Education within the Agency

Current Status

- Education Portfolio and Self Assessment – ongoing
- Utilize new PD meetings to fostering interaction with NPLs from other units
- CSREES' Grants Writing Workshops
- White House Initiative on Hispanic STEM Achievement

- State liaison roles
- Working with NPL State Liaisons outside of SERD with 1994 liaison responsibilities
- 1994 and 1890 Teaching capacity awards generate good anecdotal stories

Examples

- 1890 liaisons bring in another breath of fresh air/perspective/approach
- HSI working with NRE on a Faculty and Student Team Pilot Project allowing H S Is and NRE grantees to address Invasive Species Issues
- CP and NRE participate to help SERD support educational activities

Needs and Recommendations

- Work with all CSREES units and ACOP to develop an education roadmap as a top priority
- We need to define the term “education”
- Better Public Relations
- Need formal evaluation of CBG and Tribal programs to determine current state
- Address recommendations from the external Education Portfolio Assessment Team, Jan 2009

2. RFA confluence and sharing

Current Status

- Some sharing across programs but not coordinated
- Joint SERD - NACTA Meeting
- Joint 1890/1994 PD Research Conference with ARS

Examples

- ANNH strongly encourage curriculum change and implementation from K-20

Needs and Recommendations

- Increase communication with others in SERD/CSREES/USDA
- Be sure national issues are identified, addressed and coordinated for research, education and extension
- Require evaluation and strategic planning alignment in SERD RFAs
- Reflect client’s needs and encourage stronger stakeholder input
- Address stakeholder needs in RFAs
- More coordinated effort in sharing information across programs
- Opportunity to re-think Tribal and CBG rules and regulations

3. Unit Organization Structure and Communication

Current Status

- No efficient alignment of offices, supervisors, and personnel
- No defined processes applied consistently across unit
- Limited tracking of processes and procedures
- No clear lines of accountability
- Large number of programs requiring attention to multitude of details
- Lacking clear direction and leadership

- Minimal communication and protocol for sharing views, ideas, consensus-building, etc.
- Resources not efficiently allocated

Examples

- Recent development of MA pre-award assignment and tracking system
- Initiating database for program tracking, project summaries, impact statements, etc.
- Initiating Tribal Colleges post-award tracking system

Needs and Recommendations

- Balance workload among support staff maximizing efficiency
- Accountability for work assignments
- Restructure unit to meet current administrative and programmatic needs
- Outline of what constitutes “process” and what constitutes “program”
- Define “teams,” providing sufficient support to pre-award and post-award process and program leadership/management
- Improve supervision
- Improve internal communications
- Improve external communications
- Databases need to be accessible and in use consistently across unit
- How will “charter teams” improve production and morale?
- Develop unit strategic plan for award processes and program management to support leadership

4. NPL Roles and Functions within SERD

Current Status

- NPLs currently tasked with administrative duties
- Minimal input into unit priorities, i.e., personnel, budget, travel, etc
- Not encouraged to work with other CSREES units or USDA agencies
- No cohesive plans for professional development across the unit
- No accountability for work plans that correspond to agreed upon unit goals and objectives
- Not well briefed by leadership
- Inconsistency of NPL roles/grades within SERD and with other Unit NPLs

Needs and Recommendations

- Clearer discussion with leadership regarding roles within CSREES
- Implement formal process to solicit and respond to NPL input into SERD management decisions with respect to resources including budget, personnel and travel
- SERD needs to foster and support NPL program leadership responsibilities
- Need support for training and professional development
- Take into consideration changes and how NIFA will factor into SERD plans
- Evaluation must be based on merit
- Recognize individual effort and implement incentives for excellence
- Develop unit plans of work that correspond to individual NPL annual performance plans and focus on high priority and achievable action items
- Reorganization of SERD work structure to address current and future program responsibilities (new Hispanic Serving programs)

5. Technical and Administrative Support Roles

Current Status

- Inconsistent understanding and application of individual roles and responsibilities
- Unbalanced workload
- Differences in staff skill levels

Needs and Recommendations

- Train and empower administrative support staff to handle unit work and provide evaluation that reflects their performance
- Need more involvement in program operations
- Web presence on-line information and resources
- Identify successful models for job performance in CSREES; apply these to SERD
- Compare position descriptions with work currently being done –adjustments/realignments are needed
- Direct involvement in conferences and workshops where appropriate
- Provide opportunities for professional growth

6. Leadership Roles - Director Positions

Current Status

- Need broader view beyond individual offices
- Not empowered to make decisions
- Hampered by lack of consistent processes across unit
- Hampered by unbalanced distribution of resources

Needs and Recommendations

- Develop SERD-based grant award processes and systems and assign responsibilities
- Develop long term vision for operations beyond 2009
- Forecast and secure staffing needs and resources
- Develop common understanding of problems and issues that need to be addressed; prioritize these with input from staff

7. Internal CSREES Program Sharing

Current Status

- Informal brown bag lunches
- Regular attendance/exchanges at staff and other meetings

Examples

- Joan's 1994 presentation at SERD staff meeting.
- Ali's and Saleia's presentations through the Fitness Committee
- MA NPLs collaboration on developing a 2009 SERD roadmap

Needs and Recommendations

- Update the web
- Need to showcase accomplishments

ELEMENT D - EVALUATION

1. Data and Trends Analysis

Current Status

- Data collected in a timely fashion
- Participating in the Survey of Earned Doctorates
- Some programs encourage participation in FAEIS

Examples

- Planning and Accountability and Communications units making presentations to new PD conferences for SERD
- FAEIS presenting to PDs at 1994/1890 PD Research Conference

Needs and Recommendations

- Engage more USDA personnel in awareness of the two programs
- Involve Community Colleges and other non land-grant institutions to participate - FAEIS
- Maintain updated web presence

2. Individually and collectively assess the outcomes of the programs

Current Status

- 1994 tracking and triage of individual schools capabilities – weekly tribal gathering
- Documenting outcomes and impacts through internal database and one solution
- External evaluator for Alaska Hawaii Program
- HSI Impact Database

Examples

- ANNH U Alaska -Fairbanks Consortium keeps external evaluator and report published
- Impact Reporting and developing data collection metrics
- ANNH is continuing effort to enhance reporting of outcomes and impacts
- HIS using performance based objectives

Needs and Recommendations

- Publish best practices (web)
- Analyze data collected on outcomes
- Funding for evaluation of programs
- Need to collect consistent data for program evaluation
- Continue annual face to face workshops with project directors, stakeholders
- Better data collection in CRIS and PD report writing training
- Better feedback to grantees
- Outside Evaluator from award funds - NIH model
- Need formal evaluation of CBG and Tribal programs to determine current state

Definitions for CSREES Education NPL Roadmap

AAHHE	American Association of Hispanics in Higher Education
CBG	1890 Capacity Building Grants
CP	Competitive Program
CSREES	Cooperative State Research, Education, and Extension Services
DASH	Dietary Approaches to Stop Hypertension Food and Agricultural Education Information System
FAEIS	Federally-Recognized Tribes Extension Program
FRTEP	Geographic information systems
GIS	Hispanic Serving Institutions
H S I	Indian Country Extension Website
ICEWEB	Intergovernmental Personnel Act
IPA	International Science and Education Competitive Grants Program
ISE	Multicultural Alliances
MA	North American Colleges and Teachers of Agriculture
NACTA	Native American Research Center for Health
NARCH	National Center for Education Statistics
NCES	National Institute of Food and Agriculture
NIFA	National Institute of Health
NIH	National Program Leader
NPL	Natural Resources and the Environment
NRE	Request for Application
RFA	Survey of Earned Doctorates
SED	Science and Education Resources Development
SERD	Science, Technology, Engineering, and Mathematics
STEM	United States Department of Agriculture
USDA	

Table 5: Partnering Agencies and Organizations

Name of Program	Agency Type
Agricultural Research Service (ARS)	USDA Agency
Animal and Plant Health Inspection Service (APHIS)	USDA Agency
Farm Service Agency (FSA)	USDA Agency
Food and Nutrition Service (FNS)	USDA Agency
Food Safety and Inspection Service (FSIS)	USDA Agency
Foreign Agricultural Service (FAS)	USDA Agency
Forest Service (FS)	USDA Agency
Natural Resources Conservation Service (NRCS)	USDA Agency
Department of Education (DEd)	Non-USDA Federal Agency
Department of Energy (DOE)	Non-USDA Federal Agency
National Aeronautics and Space Administration (NASA)	Non-USDA Federal Agency
National Science Foundation (NSF)	Non-USDA Federal Agency
Hispanic-Serving Institutions (H S I)	Non Federal Organization
Land-Grant Institutions (1862, 1890, 1994)	Non Federal Organization
Non-Land Grant Institutions	Non Federal Organization
Other Educational Institutions	Non Federal Organization

Appendix - Section II

Table 6: Legislative Authorizations and Eligibility for Primary Programs

Secondary and Two-Year Postsecondary Agriculture Education Challenge Grants Program (SPEC)

Section 1405 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended, (7 U.S.C. 3121) designates the U.S. Department of Agriculture (USDA) as the lead Federal agency for agriculture research, extension and teaching in the food and agricultural sciences. Section 7109 of the Food, Conservation, and Energy Act of 2008 (P.L. 110-246) amends the authority for this program contained in section 1417(j) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (7 U.S.C. 3152(j)). Applications may be submitted by: (1) public secondary schools, (2) public or private nonprofit junior and community colleges, (3) institutions of higher education, or (4) nonprofit organizations.

1890 Institution Capacity Building Grants Program (CBG)

Authority for this program is contained in section 1417 (b)(4) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (NARETPA) (7 U.S.C. 3152 (b)(4)) and pursuant to annual appropriations made available specifically for the 1890 Capacity Building Program. Those institutions eligible to receive funds under the Act of August 30, 1890, (26 Stat. 417-419, as amended; 7 U.S.C. 321-326 and 328), including Tuskegee University and West Virginia State University.

Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grants Program (ANNH)

This program is administered under the provisions of section 759 of Pub. L. 106-78 (7 U.S.C. 3242. Eligible individual public or private, nonprofit Alaska Native-Serving and Native Hawaiian-Serving Institutions of higher education that meet the definitions of Alaska Native-Serving Institution or Native Hawaiian-Serving Institution established in Title III, Part A of the Higher Education Act of 1965, as amended (20 U.S.C. 1059d.) are eligible institutions under this program.

Higher Education Challenge Grants Program (HEC)

Section 1405 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (NARETPA), as amended, (7 U.S.C. 3121) designates the U.S. Department of Agriculture (USDA) as the lead Federal agency for agriculture research, extension and teaching in the food and agricultural sciences. Authority for this program is contained in section 1417(b)(1) of NARETPA (7 U.S.C. 3152(b)(1)). Applications may be submitted by: (a) U.S. public or private nonprofit colleges and universities offering a baccalaureate or first professional degree in at least one discipline or area of the food and agricultural sciences; (b) land-grant colleges and universities, (including land grant institutions in the

Insular Areas); (c) colleges and universities having significant minority enrollments and a demonstrable capacity to carry out the teaching of food and agricultural sciences; and (d) other colleges and universities having a demonstrable capacity to carry out the teaching of food and agricultural sciences. A college or university must meet the definition of an Eligible Institution as stated in this RFA (see Definitions, Part VIII, E.).

Hispanic-Serving Institutions Education Grants Program (HSI)

This program is administered under the provisions of section 1455 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977, as amended (NARETPA) (7 U.S.C. 3241) pursuant to section 815 of Public Law 104-127. Awards may only be made to public or other non-profit Hispanic-Serving Institutions as defined in the definitions section of this RFA. To be eligible for competitive consideration for an award under this program, a Hispanic-Serving Institution must at the time of application certify that it has an enrollment of undergraduate full-time equivalent students that is at least 25 percent Hispanic students.

International Science and Education Competitive Grants Program (ISE)

Section 229 of the Agricultural Research, Extension and Education Reform Act of 1998 (AREERA) amended Section 1459 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (NARETPA) (7 U.S.C. §3292b). Applications may be submitted by colleges and universities as defined in section 1404 of NARETPA. The terms “college” and “university” mean an educational institution in any State which (1) admits as regular students only person having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such a certificate, (2) is legally authorized within such State to provide a program of education beyond secondary education, (3) provides an education program for which a bachelor’s degree or any other higher degree is awarded, (4) is a public or other nonprofit institution, and (5) is accredited by a nationally recognized accrediting agency or association.

Resident Instruction Grants for Institutions of Higher Education in Insular Areas (RIIA)

This program is administered under the provisions of the Farm Security and Rural Investment Act of 2002 (Section 7501 of Public Law 107-171), which amended the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3101 et seq.) by providing for a program of resident instruction grants for insular areas (7 U.S.C. 3363). Applications may be submitted only by an Eligible Institution. For the purposes of the RIIA Program, the term “eligible institution” means an institution of higher education, as defined in section 101(a) of the Higher Education Act of 1995 (20 U.S.C. 1001(a)), that is located in an Insular Area as defined in this announcement, and that has a demonstrable capacity to carry out teaching and extension programs in the food and agricultural sciences. Individual land-grant colleges and universities, and other institutions that have secured land-grant status through Federal legislation, and which are

located in Insular Areas as defined in this announcement, are automatically eligible for awards under the RIIA Program, either as direct applicants or as parties to a consortium agreement. Eligible applicants must offer at least a 2-year program of study with a demonstrable capacity to conduct teaching and extension activities in the food and agricultural sciences, and must be located in an Insular Area. Insular Areas are defined by law as: (1) the Commonwealth of Puerto Rico, (2) Guam, (3) American Samoa, (4) the Commonwealth of the Northern Mariana Islands, (5) the Federated States of Micronesia, (6) the Republic of the Marshall Islands, (7) the Republic of Palau, and (8) the Virgin Islands of the United States.

Tribal Colleges Education Equity Grants Program (TCEG)

Authority for this program is contained in the Equity in Educational Land-Grant Status Act of 1994 (7 U.S. C. 301) as amended by the Agricultural Research, Extension and Education Reform Act of 1998 (7 U.S.C. 7601).

Tribal Colleges Endowment Fund

This is a non-competitive grants program for the 33 Tribal Colleges and Universities designated as 1994 Land-Grant Institutions under the authority of the Equity in Educational Land-Grant Status Act of 1994 (7 U.S.C. 301 note), and as amended by the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7601 note).

Higher Education Multicultural Scholars Program (MSP)

Legislative authority for this program is contained in section 1417 of the National Agricultural Research, Extension and Teaching Policy Act of 1977 (NARETPA) (99 Stat. 1548; 7 U.S.C. 3152). USDA/CSREES administers this federal assistance grant program to support food and agricultural sciences baccalaureate and Doctor of Veterinary Medicine (D.V.M.) degree training of the next generation of scientists, policy makers, and educators in the Food and Agricultural Sciences. Applications may be submitted by: (1) land-grant institutions, (2) colleges and universities having significant minority enrollments and a demonstrable capacity to carry out the teaching of food and agricultural sciences, and (3) other colleges and universities having a demonstrable capacity to carry out the teaching of food, and agricultural sciences. Research foundations maintained by an eligible college or university are eligible to submit undergraduate and/or D.V.M. training proposals under this RFA. Applicants should be institutions that confer an undergraduate or D.V.M. degree in at least one of the disciplines in the food and agricultural sciences.

Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowships Grants Program (NNF)

Legislative authority for this program is contained in section 1417 of the National Agricultural Research, Extension and Teaching Policy Act of 1977 (NARETPA) (99 Stat.

1548; 7 U.S.C. 3152). This program is also subject to federal regulations [http://www.access.gpo.gov/nara/cfr/waisidx_05/7cfr3402_05.html] as outlined in administrative provisions that can be found at 7 CFR 3402. Applications may be submitted by: (1) land-grant institutions, (2) colleges and universities having significant minority enrollments and a demonstrable capacity to carry out the teaching of food and agricultural sciences, and (3) other colleges and universities having a demonstrable capacity to carry out the teaching of food, and agricultural sciences. Research foundations maintained by an eligible college or university are eligible to submit graduate training proposals under this RFA. Applicants should be institutions that confer a graduate degree in at least one of the Targeted Expertise Shortage Areas (TESA).

Table 7: Web Resources for Awarded Primary Funded Projects

Descriptions of Funded Projects by Program can be found at:

http://faeis.ahnrit.vt.edu/serd/serd_grants.shtml

Current Research Information System (CRIS)

<http://cris.csrees.usda.gov/>

By using the CRIS Assisted Search (on the left) you can search for SERD Projects

Select Project Type SERD Grant (E)

Select a year for the grant and select SEARCH

The resulting number of projects funded will appear and you select DISPLAY RESULTS

All of the grants will appear.

By placing a check mark in the box to the left of the grant and selecting DISPLAY SELECTIONS the full information will be displayed, or you can select MORE and the same information will appear.

For more details, by selecting FULL HISTORY, information on the Classifications is found.

Table 8: Enrollment by Program Area as Reported in FAEIS 2002-2006



Enrollment in Selected Program Areas at All Institutions					
	2002	2003	2004	2005	2006
<u>Programs</u>					
Agriculture, Agriculture Operations, and Related Sciences	50,167	69,222	70,718	73,269	78,911
Family and Consumer Sciences/Human Sciences	30,876	43,894	53,238	57,283	65,245
Natural Resources and Conservation	15,533	20,826	21,605	21,919	27,510
Veterinary Medicine (including DVM)*	5,163	7,004	7,370	8,209	8,685
Total	101,739	140,946	152,931	160,680	180,351

*Includes DVM data from AAVMC only



NOTE: FAEIS is a voluntary data reporting system, these data reflect data collected from all institutions during the 2002-2006 time frame. Some institutions may not have reported in the earlier years.

**Tables 9: Degrees Awarded in the Food and Agricultural Sciences
Programs by Degree Level 2002-2006**

2002-2003						
	Associates	Bachelors	Masters	Doctoral	First-professional	Total
Agriculture & Veterinary Medicine	6,658	17,781	3,535	1,397	2,354	31,725
Natural Resources	1,484	10,863	2,798	525	0	15,670
Family Consumer Sciences Human Sciences	11,630	26,376	2,795	492	0	41,293
Total	19,772	55,020	9,128	2,414	2,354	88,688
All degrees Awarded 2002-2003	634,016	1,348,811	513,339	80,897	46,042	2,623,105

2003-2004						
	Associates	Bachelors	Masters	Doctoral	First-professional	Total
Agriculture & Veterinary Medicine	6,835	17,747	3,890	1,464	2,332	32,268
Natural Resources	1,543	13,021	3,428	616	0	18,608
Family Consumer Sciences Human Sciences	13,195	29,523	3,105	460	0	46,283
Total	21,573	60,291	10,423	2,540	2,332	97,159
All degrees Awarded 2003-2004	665,301	1,399,542	558,940	83,041	48,378	2,755,202

2004-2005						
	Associates	Bachelors	Masters	Doctoral	First-professional	Total
Agriculture & Veterinary Medicine	7,154	18,198	3,972	1,471	2,354	33,149
Natural Resources	1,506	13,293	3,684	618	0	19,101
Family Consumer Sciences Human Sciences	12,668	31,663	3,248	499	0	48,078
Total	21,328	63,154	10,904	2,588	2,354	100,328

All degrees Awarded 2004-2005	696,660	1,439,264	574,618	87,289	52,631	2,850,462
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Source: NCES

2005-2006						
	Associates	Bachelors	Masters	Doctoral	First-professional	Total
Agriculture & Veterinary Medicine	6,950	17,811	4,018	1,398	2,370	32,547
Natural Resources	1,416	13,575	3,547	668	0	19,206
Family Consumer Sciences Human Sciences	12,737	33,171	3,451	497	0	49,856
Total	21,103	64,557	11,016	2,563	2,370	101,609
All degrees Awarded 2005-2006	713,066	1,485,242	594,065	87,655	56,067	2,936,095

Total Degrees Awarded 2002-2006 by Program Area and Level of Degree.

	Associates	Bachelors	Masters	Doctors	First-professional	Total
Agriculture & Veterinary Medicine	27,597	71,537	15,415	5,730	9,410	129,689
Natural Resources	5,949	50,752	13,457	2,427	0	72,585
Family Consumer Sciences Human Sciences	50,230	120,733	12,599	1,948	0	185,510
Total	83,776	243,022	41,471	10,105	9,410	387,784

Source: NCES

Table 10: Gender of Graduates Across all Degree Levels in Selected Fields 2003-2006

All Degrees Awarded in:	2002-2003		2003-2004		2004-2005		2005-2006	
	Males	Females	Males	Females	Males	Females	Males	Females
Agriculture & Veterinary Medicine	15,691	16,034	15,541	16,727	15,736	17,413	15,279	17,268
Natural Resources	8,526	7,144	9,835	8,773	10,197	8,904	10,269	8,937
Family Consumer Sciences Human Sciences	5,235	36,058	5,915	40,368	6,235	41,843	6,492	43,364
Total	29,452	59,236	31,291	65,868	32,168	68,160	32,040	69,569

SOURCE: NCES

Table 11: Ethnicity of Graduates Across all Degree Levels in Selected Fields 2002-2006

Ethnicity of Graduates Across all Degree Levels 2002-2006							
<i>All Degrees Awarded In: 2002-2003</i>	Nonresident Alien	Black non-Hispanic	American Indian/ Alaska Native	Asian or Pacific Islander	Hispanic	White non-Hispanic	Race/ethnicity Unknown
Agriculture & Veterinary Medicine	1,678	813	221	847	886	26,213	1,067
Natural Resources	737	430	165	371	432	12,896	639
Family Consumer Sciences Human Sciences	1,806	4,477	313	1,905	2,829	28,573	1,390
Total	4,221	5,720	699	3,123	4,147	67,682	3,096
<i>All Degrees Awarded In: 2003-2004</i>	Nonresident Alien	Black non-Hispanic	American Indian/ Alaska Native	Asian or Pacific Islander	Hispanic	White non-Hispanic	Race/ethnicity Unknown
Agriculture & Veterinary Medicine	1,854	834	208	834	919	26,457	1,162
Natural Resources	908	480	232	468	553	15,050	917
Family Consumer Sciences Human Sciences	2,309	5,151	404	2,015	3,329	31,142	1,933
Total	5,071	6,465	844	3,317	4,801	72,649	4,012
<i>All Degrees Awarded In: 2004-2005</i>	Nonresident Alien	Black non-Hispanic	American Indian/ Alaska Native	Asian or Pacific Islander	Hispanic	White non-Hispanic	Race/ethnicity Unknown
Agriculture & Veterinary Medicine	1,857	788	235	841	1,151	27,126	1,151
Natural Resources	943	500	201	516	740	15,266	935

Family Consumer Sciences Human Sciences	1,874	5,046	401	2,089	3,637	33,064	1,967
Total	4,674	6,334	837	3,446	5,528	75,456	4,053

Source: NCES

Ethnicity of Graduates Across all Degree Levels 2002-2006							
<i>All Degrees Awarded In: 2005-2006</i>	Nonresident Alien	Black non- Hispanic	American Indian/ Alaska Native	Asian or Pacific Islander	Hispanic	White non- Hispanic	Race/ethnicity Unknown
Agriculture & Veterinary Medicine	1,699	861	263	990	997	26,594	1,143
Natural Resources	952	544	247	512	555	15,365	1,031
Family Consumer Sciences Human Sciences	1,893	5,285	414	2,361	3,771	33,983	2,149
Total	4,544	6,690	924	3,863	5,323	75,942	4,323

Source: NCES

Table 12: Ph.D Recipients in Selected Agriculture Disciplines 2002-2006

	2002	2003	2004	2005	2006	TOTALS
TOTAL Agriculture	1,287	1,262	1,259	1,286	1,246	6,340
TOTAL Natural Resources	699	752	785	832	830	3,898
TOTAL Human Sciences	612	629	623	671	717	3,252
Grand TOTAL	2,598	2,643	2,667	2,789	2,793	13,490

Source: NSF Survey of Earned Doctorates

Table 13: NPL Summary of Program by Target Area

Agriculture in the Classroom (AITC)

Agriculture in the Classroom meets the target area of Faculty Training and Development by offering national, regional and state training opportunities each year to 70,000 seasoned K-12 Teachers and 20,000 teachers in training. These national, regional and state training opportunities and scholarships allow K-12 teachers from across various segments of K-12 education to participate with faculty from across their state, region and nation, to learn best practices which can be used in their classroom environments. Funded projects also enable K-12 teachers to become familiar with new technological advances which will accelerate communications with students. Funded projects also enable K-12 teachers to learn about new curriculum and new programs that have been developed for use in the classroom. Although the major focus of the grants awarded by Agriculture in the Classroom is on faculty training and development, target areas (2, 4 and 5) are also impacted through the use of these grants.

Secondary and Two-Year Postsecondary Agriculture Education Challenge Grants Program (SPEC)

The Secondary and Two-Year Postsecondary Agriculture Education Challenge Grants program meets the target area of Curriculum & New Program Development by funding projects in the nation's high schools and community colleges that respond to emerging local, regional or national needs within agribusiness or agriscience areas. Funded projects tend to involve both updating classroom content and acquiring corresponding scientific equipment or supplies needed to address new occupational competencies (for example, basic tissue culture techniques used in biotechnology, GPS principles used in precision agriculture or aquaculture practices employed by increasingly diversified farming operations). The program also supports agricultural literacy by placing agricultural sciences-related examples into core secondary courses such as English, social sciences and math. Innovative teaching practices are also encouraged so that undecided students may become stimulated to declare agricultural sciences as a major field of study. Because many applicants work in small academic units, often as the only agricultural sciences faculty on staff, projects that form partnerships with other academic institutions, as well as with employers of the program's graduates, are strongly encouraged. For many applicants, these funds provide the only source of extramural support to enable teachers to update or to introduce new coursework, to take students on a field trip, or to provide faculty enrichment opportunities (attendance at scientific or professional conferences or workshops) to learn new skills.

1890 Institution Capacity Building Grants Program (CBG)

The 1890 Institutions primarily uses the CBG grants program to address the two target areas of "Recruitment, Retention and Graduation and Curriculum and New Program Development". Funds are used to the data suggests that the emphasis on target area has shifted in the past 5 years. As degree programs in the food and agriculture sciences

became established, the attention has shifted to recruiting and keeping in-coming freshmen in these degree programs. It is also becoming clear that recruitment efforts need to begin at pre secondary grades to ensure a well-prepared student recruitment pool who are knowledgeable in the sciences and exposed to applied agricultural problem solving techniques. A good synergy has developed between these two target areas as curricula are being developed that compliment the recruiting and retention activities. Degree programs and courses that are relevant to today's youth and are addressing real needs within their communities such as natural resources, nutrition and fashion are increasingly being developed. This coupled with incorporating learning styles that look at systems and get students involved in real-life problem solving as well as using GIS and other updated technology are helping to capture student interest. Faculty development and training is also increasing as a target area of the CBG awards both at the 1890s and with k-12 teachers.

Alaska Native-Serving and Native Hawaiian-Serving Institutions Education Grants Program (ANNH)

Within the 5-year period in FY 2002-FY 2006, 18-20 eligible Alaska Native-Serving and Native Hawaiian-Serving Institutions received more than \$15m to spearhead 36 competitive projects which addressed all 6 target areas of the SERD theme, "Support and Strengthen Institutions Offering Programs in the Area of Food, Agricultural and Related Sciences." The funded projects included 2 consortia, one in each state involving at least 13 institutions, Cooperative Extension Service, K-12 students and teachers, state, federal, and multiple community organizations. Considering the thrust of the program to recruit, retain, train and graduate Alaska Native and Native Hawaiian students to enter the workforce in food and agricultural sciences, the involvement of multiple partners from institutions, communities, and agribusinesses was very significant for the success of the program. For example, given the vastness of Alaska, remote Alaska Native students were extended scholarships, housing and meals through joint support of the institutions and stakeholders. The program provided distance learning through web and electronic technology, trained faculty, updated curriculum to innovative instructional materials, offered experiential and collaborative learning and integrated programming possible in order to reach isolated students with unusual challenges that often times prevented them from attending residential colleges. These innovative approaches in student recruitment, curriculum design and delivery systems, student experiential learning, stipends and scholarships, have resulted in increased enrollment of native students as legislatively mandated in the program.

Higher Education Challenge Grants Program (HEC)

The Higher Education Challenge Grants program meets the target area of Curriculum & New Program Development by funding projects with the goal of increasing the quality of postsecondary instruction in all disciplines within the food and agricultural sciences. Funded projects vary in scope from updating classroom content to developing new academic majors or concentrations. Innovation is a core principle guiding these projects. Collaboration with other academic institutions, as well as with employers of the

program's graduates, is another strongly encouraged project attribute. Significantly larger grants are awarded for projects that involve multiple institutions and diverse partnerships that can demonstrate more efficient delivery of coordinated, academic instruction that reduces instructional duplication and costs. A prime example of this would be a grant involving several baccalaureate-level institutions, an employer, and possibly a community college, that all share resources to deliver a series of courses in an emerging area of science or technology, through the Internet, in a way that maximizes the resources of each of the participants, but does not require each academic institution to duplicate the other's efforts. Delivery of this material to the community college or to a high school, through offering advanced placement credit to students, may not only streamline transfer and articulation agreements, but also, when targeted to underrepresented populations, help increase the future diversity of the food and agricultural sciences workforce. While research and extension activities may also be included in a funded project, the primary focus must be to improve teaching within a degree-granting program. An example is the advancement of teaching methodologies, or pedagogy. Projects introducing faculty to more effective teaching styles to address changing student needs (asynchronous learning, learner-centered teaching, and retention strategies, for example) are another component of this program's impact.

Hispanic-Serving Institutions Education Grants Program (HSI)

International Science and Education Competitive Grants Program (ISE)

The International Science and Education competitive grants program meets the target area of Collaborative & Integrated Programs by awarding grants to faculty for programs that support international collaborative research, extension, and teaching activities. Due to the nature of this program, collaboration with other U.S. institutions and international partners is encouraged. Although the major focus of grants awarded by the ISE program is on Collaborative & Integrated Programs, the target area of Curriculum & New Program Development is also impacted by awarding grants to faculty whose programs focus on enhancing the international content of their curricula with the goal of producing globally competent professionals.

Resident Instruction Grants for Institutions of Higher Education in Insular Areas (RIIA)

The Resident Instruction Grants Program for Institutions of Higher Education in Insular Areas meets the target area of Teaching Methodology, Experiential & Collaborative Learning by strengthening the ability of these institutions to carry out teaching programs within uniquely-defined food and agricultural sciences-related disciplines as they occur on remote Pacific islands. Most Insular Area Institutions are small community colleges serving isolated, local agricultural sciences needs. Like the mainland high schools and community colleges we serve in the SPEC program, the Insular Areas are characterized by limited faculty and educational resources, isolated students with traditional agricultural experiences, and often poor employment prospects if they remain close to

home upon graduation. Accordingly, funds in this grants program are focused on establishing and maintaining a single consortium of eight institutions to develop instructional delivery systems among and between Insular Area Institutions. Funds have enabled each of these institutions the capacity to establish a distance learning center and offer more updated materials to students. This program also provides limited undergraduate stipend and scholarship opportunities to assist students in traveling off island to other locations where they are exposed to a wider diversity of academic and employment choices to advance their career. Projects also enable partnerships with local governments, non-governmental organizations, and mainland universities and other educational institutions to increase resources available to faculty and students.

Tribal Colleges Education Equity Grants Program (TCEG)

The 1994 Tribal Colleges Equity grant program is utilized primarily to fund “Curriculum Development and New Programs”. Many of the Tribal Land Grant Schools, 80 % of which are 2-year or community colleges, would simply not have programs in the food and agricultural sciences without the assistance of Equity funding. In fact, faculty salaries and training, degree programs, laboratory and classroom equipment and student recruitment and retention are all treated as a package that permits Native American students on the reservations to have access to degree or certificate programs that make them employable in reservation jobs or in many cases prepares them to graduate into 4-year degree programs at other institutions. The Equity Programs, by legislative mandate, contain enough program flexibility to allow tribal colleges to develop specialized food and agricultural curricula that is culturally relevant and integrates indigenous knowledge to attract students who might otherwise not enroll or who would enroll in other degree programs. Additional program strengths of Equity driven curricula are that academic areas such as natural resources and environmental and sustainable science can be emphasized. This adds more relevancy as these issues that are of concern to all the communities and students that our 1994 institutions serve. Utilizing GIS technology and distance education are tools that are increasingly being used to attract and retain students. Without the Equity grant program, food and agricultural science at the 1994 Land Grant schools would be extremely difficult to support.

Tribal Colleges Endowment Fund

The 1994 Tribal Colleges primarily use the Endowment Fund to address the target area of “Instructional Materials, Equipment and Facilities “. Funds are used to construct or renovate teaching and learning centers, laboratories, campus wellness centers, greenhouses for research and demonstration, and the purchase of IT and distance learning equipment. Secondary uses of the Endowment Fund are in two broad areas – student recruitment and faculty and staff salaries in the food and agricultural sciences. The construction and renovation of campus facilities is important to establishing the Tribal Colleges as relevant Land Grant Institutions. New facilities are essential for growing these institutions as centers of learning and inquiry. Most of the Tribal Colleges are two year community colleges that need state of the art learning facilities to prepare students for moving onto other four-year institutions. With many of the Tribal College students being older and with established families or living at a distance whereby attending

campus classes is problematic, wellness centers and distance education capabilities allow these non-traditional students to enroll in and attain their college degrees. Often, degree programs in the food and agricultural sciences would not be possible because of a lack of funds to support the necessary faculty or staff. The Endowment program is used to hire faculty and staff that allow Tribal Colleges to conduct programs in Education, Research and Extension.

National Needs Graduate and Postgraduate Fellowships Grants Program (NNF)

The Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowship (NNF) Grants Program meets the target area of Recruit, Retain, Train and Graduate Students through awards to successful higher education institutions for stipend support to students pursuing graduate level training in areas of targeted expertise shortage areas. The awards also address attaining global competency along with technical and management competencies in food and agriculture by the NNF fellows; the higher cost of graduate education, and provide access to beneficiaries from diverse groups who may not participate in graduate education for the national Science, Technology, Engineering and Mathematics (STEM) initiative within the domain of food and agricultural sciences. In this review period, 243 applications were received; 92 awards were made to train 323 graduate students at the Master's and/or doctoral levels. Support was provided for 102 students to participate in international and other experiential learning opportunities. The NNF program awards encompassed training for integrated understanding of policy, agricultural sciences, production agriculture, food systems analysis, and environmental resource management; providing well-trained personnel to nucleate emerging sectors of the food and agriculture economy; and addressing the mixed messages and professional mentorship related to graduate education for students from traditionally underrepresented groups. The awards resulted in graduate training that developed intellectual capital to ensure the preeminence of U.S. food and agricultural systems. In the period of this portfolio review, the Fellows matriculating from the NNF program have been employed in academia; and by such USDA agencies as the Agricultural Research Service, the Economic Research Service, the Forest Service, and the National Resources Conservation Service; and private sector entities such as Pioneer Hi-Bred.

Multicultural Scholars Program (MSP)

The Higher Education Multicultural Scholars Program (MSP) grants meet the target area of Recruit, Retain, Train and Graduate Students through awards to successful higher education institutions for scholarship support to student beneficiaries pursuing first professional degree training in Veterinary Medicine and/or baccalaureate level training in areas of food and agricultural science areas. The awards also address attaining workforce competency through support for special experiential learning opportunities; the rising cost of higher education, and provide access to beneficiaries from diverse groups who may not participate in higher education for the national Science, Technology, Engineering and Mathematics (STEM) initiative within the domain of food and agricultural sciences. The awards prepare students to meet the demand for highly qualified personnel entering the workforce in the food and agricultural sciences; pipelining more undergraduates into graduate education, increasing the representation of

diverse cultural groups in the fields of food and agricultural sciences, or closely allied disciplines; and addressing the substantial gap between Black, Latino, First American, White and other populations entering graduate schools to enable the U.S. higher education system to remain internationally competitive. In this portfolio review period, 44 awards were made to train 24 students at the D.V.M. and 162 at baccalaureate levels. Support was provided for 26 students to participate in other special experiential learning opportunities. In this period of review, the Scholars matriculating through MSP awards have been employed in the food systems domain. Through MSP awards, Scholars became high impact individuals in the field of veterinary medicine upon graduation; benefitted from curricula that were interdisciplinary and featured tutorial based learning in the early years that allowed students to develop their reasoning abilities and engage in self-directed learning, skills which became invaluable in their professional lives. Scholars awarded degrees are pursuing further training in medical technology certification; graduate education and in cases American Indian graduates returned to home reservations to work in Nutrition/Healthcare or Natural Resources and Environmental Management. MSP scholars also gained global competency, as an example, Scholars in one program completed a one-month study abroad experience to Ghana, Africa. Their study tour included eco-tourism and wildlife management.

Appendix - Section III

Table 14: Legislative Background for Selected Secondary Educational Programs

Payments to Agricultural Experiment Stations under the **Hatch Act Agricultural Experiment Stations Act** of August 11, 1953, Hatch Act 1997 as amended – 7 U.S.C. 361a-361i,

Funds under the Hatch Act are allocated to the State Agricultural Experiment Stations (SAES) of the 50 States, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, Micronesia, American Samoa, and the Northern Mariana Islands for research to promote sound and prosperous agriculture and rural life.

The **National Research Initiative (NRI) Competitive Grants Program** was authorized in section 2(b) of the Act of August 4, 1965, as amended by section 1615 of the Food, Agriculture, Conservation, and Trade Act of 1990 (FACT Act), (7 U.S.C. 450i(b)) to support research with the greatest potential of expanding the knowledge base needed to solve current problems, as well as to meet unforeseen issues that will face the future agricultural and forestry enterprise.

The Agricultural Research, Extension, and Education Reform Act (AREERA) of 1998 (7USC450i) expanded the purposes under the Food and Agriculture Act of 1977 to include extension or education activities. In fiscal year 2003, Section 737 of the General Provisions of the Consolidated Appropriations Resolution (Pub. L. 108-7) provided CSREES with the authority to use up to 20 percent of the amount made available in the Act for the NRI to carry out a competitive grants program under the same terms and conditions as those provided in Section 401 of AREERA to integrate research, education, and extension activities. Congress has continued that provision in subsequent years, and in fiscal year 2008 it grew to 26 percent of NRI funds.

Cooperative Forestry Research – (McIntire-Stennis) – The **Cooperative Forestry Research Act** of October 10, 1962, 16 U.S.C. 582a-7; Public Law 69-374; Public Law 97-98; Public Law 99-198; Public Law 101-624; and Public Law 104-127.

The Act also provides that payments must be matched by funds made available and budgeted from non-federal sources by the certified institutions for expenditure on for expenditure on forestry research.

Payments to 1890 Colleges and Tuskegee University and West Virginia State University – The National Agricultural Research, Extension and Teaching Policy Act of 1977, Section 1445, Public Law 95-113 (Evans-Allen Formula Grants Program):

The agriculture research programs, at the 1890 Land–Grant Colleges and Universities are designed to generate new knowledge which will assist rural underprivileged people and small farmers to obtain a higher standard of living.

Special Research Grants – Section 2 (c), Act of August 4, 1965, 7 U.S.C. 450I (c), as amended.

Special Research Grants are awarded on a discretionary basis, as well as through the use of competitive scientific peer and merit review processes.

Section 406 Integrated Programs - CSREES uses the statutory authority in Section 406 (7 U.S.C. 7626) of AREERA to fund integrated, multifunctional agricultural research, education, and extension activities.

Tribal College Research Grant Program - Section 1405 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (NARETPA), as amended (7 U.S.C. 3121), designates the U. S. Department of Agriculture (USDA) as the lead Federal Agency for agricultural research, extension, and teaching in the food and agricultural sciences. Authority for this program is contained in the Equity in Educational Land-Grant Status Act of 1994 (7 U.S.C. 301 note), as amended by the Agricultural Research, Extension, and Education Reform Act of 1998 (7 U.S.C. 7601 note). In accordance with the statutory authority, subject to the availability of funds, the Secretary of Agriculture may award competitive grants, as defined in section 536 of the Equity in Educational Land Grant Status Act of 1994 (7 U.S.C. 301 note), to assist the 1994 Land-Grant Institutions in conducting agricultural research that addresses high priority concerns of tribal, national or multi-state significance.

1890 Facilities Grant Program - Pursuant to the authority contained in Section 1447 of the National Agricultural Research, Extension, and Teaching Policy Act (NARETPA) of 1977, as amended (Pub. L. No. 95-113), grants will be awarded under the Facilities Grant Program to the 1890 land-grant institutions, including Tuskegee University and West Virginia State University.

Tribal College Extension Program - This program is authorized under Section 534(b) of the Equity in Educational Land-Grant Status Act of 1994 (7 U.S.C. 301 note), as amended by the Agricultural Research, Extension, and Education Reform Act of 1998 (AREERA) (7 U.S.C. 7601). This section amends Section 3 of the Act of May 8, 1914 (Smith-Lever Act) (7 U.S.C. 341 et seq.), as amended. Under this authority, appropriated funds are to be awarded to the 1994 Land-Grant Institutions (hereinafter referred to as 1994 institutions) for Extension work and funds are to be distributed on the basis of a competitive application process.

Federally-Recognized Tribes Extension Program - This program is authorized under Section 3(d) of the Act of May 8, 1914, Smith-Lever Act, ch. 79, 38 Stat. 372, 7 U.S.C. 341 et seq. This program supports extension agents on American Indian Reservations and Tribal jurisdictions to address the unique needs and problems of American Indian Tribal Nations.

Table 15: Other Science and Education Resources Development (SERD) Programs Making Secondary Contributions to Education Portfolio

1890 Facilities Grant Program

The Facilities Grant program is used for the acquisition and improvement of agricultural and food sciences facilities and equipment, so that the 1890 institutions may participate fully in the production of human capital in the food and agricultural sciences.

Funding awarded to states under 1890 Facilities Grant Program, FY 2002 – 2006.

Fiscal Year (FY)	Total Projects	Total Program Dollars Awarded to States
2002	18	\$13,500,000
2003	18	\$14,903,000
2004	18	\$14,912,000
2005	18	\$16,777,000
2006	18	\$16,609,000
Total		\$76,701,000

1890 Facilities Grant Program Key Activities:

- New Facilities Constructed
 - Tuskegee University
 - Fort Valley University
 - Langston University
 - Virginia State University
 - Prairie View A&M University
- Facilities Renovated
 - Tuskegee University
 - University of Arkansas-Pine Bluff
- Major Land Purchases
 - Delaware State University
 - University of Maryland Eastern Shores
- Major Laboratory, and Farm Equipment purchased
 - Alabama A&M University
 - Virginia State University

1890 Facilities Grant Program Key Outputs and Outcomes:

The Facilities Grant Program enhanced the effectiveness at the 1890 land grant institutions in research, extension and education.

- New cutting edge research technology has responded to customer needs.
- Experiential learning opportunities have been improved.
- Extension outreach service has been enhanced by at least 60 percent

- through new programs in health, nutrition and family life skills
- New degree programs:
 - Ph.D. (Plant & Soil Science Program) – Alabama A&M University
 - Ph.D. (Food Science Program) – University of MD - Eastern Shore
- More than 1,000 new students have matriculated in the Food and Agricultural Sciences
- Recruited faculty with expertise to enhance programs
- Experiential learning opportunities enhanced
- Constructed new/renovated research office complexes, extension office
- Conference centers and combined research and extension office centers
- Cutting edge research technology applied to customer issues
- State-of-the art teaching and learning environments
- Leveraging new dollars from state and private sector
- New regional, national and international collaborative efforts and
- partnerships
- Financial management for rural underserved communities

Tribal Colleges Research Grants Program

Tribal Colleges Research Grants Program (TCRGP) is a competitive grants program for the 1994 Land Grant Institutions to support fundamental and/or applied agricultural research projects that address high priority concerns of tribal, national or multi-state significance. Subject to the availability of funds, the Secretary of Agriculture may award grants to fund investigative and analytical studies and experimentation in the food and agricultural sciences in order to advance the body of knowledge in the basic and applied natural and social sciences within the food and agricultural sciences (Refer to TCRGP Legislative Authority in Table 23).

The 34 1994 Land Grant institutions may be awarded a maximum of one grant as the lead institution in a Regular Project Application per year. There are no limitations on the number of sub-awards to Joint Project Applications. As mandated by legislative authority, in a Regular Project Application, the 1994 applicant executes the award as part of a cooperative agreement with at least one 1862 or 1890 Land Grant institution. In a Joint Project Application, the 1994 applicant executes the award as part of a cooperative agreement with at least one 1862 or 1890 Land Grant institution, and assistance of at least one joint partner. A joint partner may include a college or university, unit of state or Tribal Government, other tribal college or university, or private sector organization with a demonstrable capacity to organize and conduct research

The projects shown below illustrate how TCRGP contributes to the education portfolio in the following target areas:

Target Area 2: Curriculum and new program development

Development of a Nutrition Education Tool for Navajo Head Start, Dine College, Shiprock, Arizona

This research project employed the theories and strategies of the community empowerment model and the focus group interview approach to develop a nutrition education resource that is culturally relevant to Navajo people.

A total of six focus groups were conducted to elicit information to aid in the development of a relevant and informative nutrition education tool. The research participants came from the Navajo Head Start and the early Childhood Education Department of Dine College in New Mexico. The educational materials developed based upon this information were reviewed with additional focus groups of parents and staff of Head Start.

Structure and Function of Microbial Communities in Mine Impacted and Non-Impacted Environments, Fort Belknap College, Harlem, Montana

Fort Belknap College (FBC), a two-year 1994 land-grant institution in Montana, provided an assessment of the impacts of mining activities on soil microbes at the Zortman-Landusky Mine (ZLM) site.

Project staff trained fifteen undergraduate interns to perform various scientific tasks associated with the research (soil sampling and analysis, water analysis, geographic information systems, data collection and analysis.) Three students in particular were trained in a number of more advanced cutting edge soils research methodologies including microbial community analysis and aggregate structure analysis. An undergraduate research quality laboratory and water quality curriculum were also developed and implemented at FBC to provide students with the necessary tools to provide further studies into this ongoing problem.

Target Area 5: Teaching methodology including experiential and collaborative learning

A Pilot Aquaculture Partnership Project to Enhance Tribal Community College Instruction, Research Extension, and Entrepreneurial, Fort Berthold Community College, New Town, North Dakota

This aquaculture research project was a collaborative effort between Fort Berthold Community College (FBCC), Iowa State University and the Natural Resources Division of the Three Affiliated Tribes. The project designs were implemented on Oake Sakakawea involving intense rearing of walleyes and/or other species in various size enclosures for educational activities including research projects, K-12 presentations and visits, FBCC curriculum inclusion and expansions, and hands-on undergraduate research experiences will be conducted.

FBCC students gained quality experience in the process of conducting research. Grades 6-12 students, FBCC students, and members of the Three Affiliated Tribes learned of the potential educational, nutritional, and economic benefits an aquaculture project could

offer to Fort Berthold. FBCC faculty gained valuable experience in the process of collaborating and cooperating with Federal and State entities, agencies, and representatives

Cryptic Biodiversity of Dine' Bikeyah: Fungal Endophytes of Native Plants on the Navajo Nation, Dine College, Tsaile, Arizona

The main goal of this project was to isolate and identify foliar endophytes from native and non-native plants on the Navajo Nation. These findings would provide a much needed baseline of the endophytes on the Navajo Nation and could provide a potential agent for biological control to combat Tamarisk invasion.

As a mentored research project that provided training for Dine College students in microbiology, molecular biology, and field ecology techniques, four mentors spent the first three weeks training the Dine College students and assisting in the lab work. The project was unique and suited to the Navajo students because they could learn current and relevant lab and field techniques and interact with research scientists and student researchers without leaving the reservation.

The identification of the endophytes added to a pool of knowledge and broadened our understanding of the diversity and coverage of the little known fungi. The potential for useful products from the endophytes needs to be pursued. The interaction between the Navajo students and their peers from other universities was an exceptional outcome. It broadened the world-view of both groups of students.

Leafy Spurge and Selenium Research at Sitting Bull College, Ft. Yates, North Dakota

Sitting Bull College's contribution to student experiential learning was a project focused on Leafy spurge (*Euphorbia esula*), a noxious weed that is rapidly spreading on the Standing Rock Sioux Reservation. Research investigated possible decreases in the aggressive leafy spurge and the spread of favorable vegetation compatible with grazing practices for livestock production.

Eight high school students and four Sitting Bull College students were given summer jobs, where unemployment is about 70 percent in the winter and 30 percent during the summer. All the students learned to identify many of the native plant species. They gathered data on plant composition and compiled the data into tables. They received training in aspects of GPS, GIS and remote sensing and were able to apply this knowledge to problems in the field. The students distributed 670,000 flea beetles on land infested with leafy spurge. This will result in the reduction in the amount of land that has become unproductive on the Standing Rock Sioux Reservation due to leafy spurge infestation.

This project acquainted many Native American students with the land and science and research techniques through experiential learning.

Disease Prevention and Mosquito-borne Viruses in North Dakota, Turtle Mountain Community College, Belcourt, North Dakota

Very little is known about the prevalence of mosquito-borne viruses in North Dakota. A project developed by Turtle Mountain Community College (TMCC) helped to determine the prevalence of mosquito species capable of transmitting viruses and the prevalence of the viruses in the mosquitoes in an area of north central North Dakota. This project increased the Nation's professional expertise base because 12 Native American students from Turtle Mountain and 2 North Dakota State University (NDSU) students were trained in a state-of-the-art virus assay method. The students also learned mosquito collection and virus transmission ecology. Both TMCC and NDSU benefited from student participation and presentations at professional meetings.

This project established baseline data for mosquito population densities, species composition and virus incidence. Data influenced virus surveillance and control decisions by public health decision-makers at the tribal, state and federal level. Food and agriculture science and higher education in the U. S. was enhanced by the fact that many students have gained valuable training and research experience in the agricultural sciences. All of the students hired at TMCC were Native American, thus increasing the diversity of students receiving scientific experience and training in agricultural science techniques.

Introducing Specialty Crops to the Fort Belknap Indian Reservation for Forage and Value Added Products, Fort Belknap College, Harlem, Montana

Fort Belknap College, a two-year 1994 land-grant institution in Montana, improved the agricultural economy of the Fort Belknap Indian Reservation by addressing local needs for increased forage production and encouraging the growth of profitable alternative crops. Forage winter wheat, spring forage barley, and canola and camelina oilseeds were planted and harvested during this award. Samples of the harvested crops were sent to a chemical laboratory to test for feed qualities of the cereal forages and for the oil contents of the oilseeds.

Two students from the Fort Belknap College participated in a week long hands-on training concerning methodology for evaluating legume Rhizobium nodulations at the Montana State University Central Agricultural Research Center. These students conducted a separate greenhouse experiment after this training at the Fort Belknap College to evaluate the effectiveness of different Rhizobium inoculants on Fenugreek nodulations.

A Collaborative Effort Toward Innovative Approaches to Soil Mapping in Forested Landscapes, Fond du Lac Tribal and Community College, Cloquet, Minnesota

Fond Du Lac Tribal and Community College (FDLTCC), a two-year 1994 land-grant institution in Minnesota, conducted soil inventories in forested landscapes to test new and innovative approaches to mapping soils and attempt to relate predicted soil types to forest

productivity in northern forested systems. This information was also incorporated into a geographic information system (GIS) database of topography, soils, and landscape information.

A student at FDLTCC presented a digital database model, as well as the research results at the 2006 Minnesota GIS/LIS Conference in St. Cloud, Minnesota. The participating faculty members developed a stronger scientific understanding of soil variability in the forested landscapes of northern Minnesota. This knowledge was incorporated into classroom lectures, field trips, and internship opportunities to ultimately positively impact undergraduate education at the college.

Target Area 3: Recruit, retain, train and graduate students prepared to enter the workforce

Aquatic Ecosystem Study of a Wild Rice Lake System, Fond du Lac Tribal and Community College, Cloquet, Minnesota

Fluctuating water levels and establishment of invasive species reduces aerial coverage and productivity of wild rice. This project tracks the recovery of wild rice after mechanical removal of an invasive weed species and accurate control of water levels. The purpose of the study is to determine how quickly wild rice recovers in an aquatic ecosystem, as well as the sustainability of the wild rice community over time.

Students in the environmental science program at Fond Du Lac Tribal community college gained significant field research experience through this project, which was designed to improve the management of wild rice lakes. They also serviced as math and science tutors at an educational camp for middle school students. This aspect of their work involved mentoring students who aspire to succeed in science. Their work gave the scientific community a better understanding of the ecological dynamics of wild rice and competing species, an area that is poorly understood at this time.

Monitoring the Microclimate of the Menominee Forest, College Of Menominee Nation, Keshena, Wisconsin

The College of Menominee Nation (CMN), a two-year 1994 land-grant institution in Wisconsin, collected meteorological data from a non-forested site on the reservation, a stand of hardwood trees, and a stand of softwood trees. Project staff acquired, installed, and collected meteorological data using sophisticated instrumentation including an ET106 Weather Station. A network within the weather stations enabled project staff to analyze new meteorological data compiled during the term of the grant.

Project staff witnessed an increase of student and other faculty interest in scientific research activities. Specifically, within science, technology, engineering, and mathematics (STEM) related programs. In the past CMN initiated few research activities; however this project has stimulated additional discussions about potential research questions. The number of students enrolled within the sustainable development major increased from four to fifteen students over the course of two years. Additionally, four

students that graduated are currently enrolled at other major universities in pursuit of related baccalaureate degrees. Student interns were also trained to increasingly expose them to research design and implementation.

Effects of Groundwater Influence on Biotic and Abiotic Parameters Among Six Tributaries to Lake Superior, Fond du Lac Tribal and Community College, Cloquet, Minnesota

Fond Du Lac Tribal and Community College (FDLTCC), a two-year 1994 land-grant institution in Minnesota, examined the biological characteristics of several tributaries to Lake Superior along a gradient of groundwater/bog influence.

Several American Indian students participated in the field research as first and second year students. Three of these students continued their education through pursuing Bachelor degrees in biology/science the following year at local universities. The project staff has continued to support undergraduate research at FDLTCC through partnering with the National Science Foundation and the National Center for Earth-Surface Dynamics.

Federally-Recognized Tribes Extension Program

The Federally-Recognized Tribes Extension Program supports extension education on Indian reservations and tribal jurisdictions to address the unique needs and problems of American Indian tribal nations. Projects funded under this program support one or more of the five Strategic Goals outlined in the CSREES Strategic Plan for FY 2004-2009: enhance economic opportunities for agricultural producers; support increased economic opportunities and improved quality of life in rural America; enhance protection and safety of the Nation's agriculture and food supply; improve the Nation's nutrition and health; and protect and enhance the Nation's natural resource base and environment. At present, there are 31 projects administered by the 1862 land-grant institutions in 17 States. (1890 institutions are eligible to participate, but currently there are no funded projects at these schools.)

For example, the Montana State University – Fort Belknap Reservation project conducts agricultural finance management and broad-based management training for producers. The project has implemented practices for improved culling, retaining replacement heifers, shorter calving intervals and improved feeding methods. Between April 2007 and March 2008, more than \$300,000 in expansion loans was approved through agricultural lenders. Nearly 1,100 calves were sold through the livestock coop weighing facility, saving more than \$25,000 for 13 producers. Twenty infestations of leafy spurge and spotted knapweed were controlled by 6 producers. Two producers increased alfalfa hay production by planting and renovating 180 acres of hay, and two individuals received private pesticide applicator licenses. Horticultural training and demonstration garden tours were held for more than 100 persons, resulting in more than 25 gardens being planted. Camps, winter fair and conservation days were organized for more than 250 youth who gained positive life and leaderships skills, respect for others and a keen sense

of regard for the environment. Five youths between the ages of 9 and 18 and their parents were trained to establish livestock herds valued at more than \$28,000. These youth and their parents learned hands-on beef and finance management practices. Almost \$35,000 in annual payments was paid by current junior agriculture loan producers.

Tribal Colleges Extension Program

The Tribal Colleges Extension Program provides funding to 1994 Land-Grant Institutions to conduct Extension education programs and activities. Awards are made to support one or more of the five Strategic Goals outlined in the CSREES Strategic Plan for FY 2004-2009. Funded projects relate to one or a combination of six major Extension areas: 4-H youth development, agriculture, leadership development, natural resources, family and consumer sciences, and community and economic development. Extension education is reaching and benefitting tribal and community members of all ages. Culturally appropriate curricula, teaching methodologies, technology and materials, which enhance the delivery of extension programs in Native American communities, have been and continue to be developed and utilized by the 1994's.

The College of the Menominee Nation (CMN) is working to strengthen the sustainable economic development potential of the Menominee, Stockbridge-Munsee, Oneida, and Potawatomi Reservations and surrounding communities through needs-based training that promotes and encourages public and professional growth and stakeholder involvement in the process. Between September 2006 and August 2007, parents, community members, Tribal Daycare personnel and Tribal Head Start personnel (159 participants) attended Early Childhood training sessions recognized by the Wisconsin Registry as continuing education hours required for all licensed child-care providers. Five hundred sixteen participants attended 55 Job-Based training sessions with topics that included case management, developing high performance teams, financial literacy and job searching/job preparation. Red Cross first aid and CPR courses (108 participants) were provided to local professionals, educators and law enforcement personnel, providing required certification. CMN contracted with the Wisconsin Department of Transportation to provide strategic planning training to tribal representatives serving on the Wisconsin Department of Transportation Tribal Task Force. The training was designed specifically to increase the level of collaboration between the administrative and functional levels of the organization.

Chief Dull Knife College (CDKC) is working to provide the Northern Cheyenne Reservation with family resource and money management financial education to help individuals and families strengthen their competencies to become healthy, productive, financially secure and responsible members of society. A savings campaign called Dull Knife Saves, which is the umbrella program that encompasses a debt management counseling pilot project, was initiated. This project is in cooperation with the Consumer Credit Counseling Service of Montana and the First Interstate Bank systems and provides the training for two CDKC Extension staff to be accredited financial counselors. Under the Individual Development Accounts project, families commit to monthly savings while

attending money management workshops and counselor meetings. At the end of the project, each family will have saved enough and earned a match so that they can purchase or make a down payment of a valued asset such as higher education or home ownership. The Volunteer Income Tax Assistance project offers IRS certified tax preparers to serve the community in order to provide a cost-free tax preparation option as well as a chance for financial management learning and community interaction.

Table 16: Natural Resources and Environment (NRE) Contributions to Education Portfolio

Tools for Integrated Watershed Management -

Tools for Integrated Watershed Management Introduction

Over the last four years, the USDA-CSREES funded the Regional Project called: “Coordinated Agricultural Water Quality Programming for the Northern Plains and Mountain Region (2004-51130-02248) with Colorado State University. The project has implemented a regionally coordinated education, extension and research activities.

This program addresses critical water quality issues of the Northern Great Plains and Mountain to redress impacts caused by grazing, irrigated agriculture, fire suppression, introduced plants, rapid growth and urban pressures. Regional efforts have focused on developing better watershed management tools, improved monitoring techniques, and increased attention to human behavior change.

Tools for Integrated Watershed Management Activities

- Educational outreach through development of Stream Side Science education Curriculum – a set of eleven (11) water related activities and lesson plans correlated directly to the 9th grade Earth Systems Science Core.
- This curriculum was a collaborative effort involving Utah State University, the Utah State Office of Education, and Governor Walker's Watershed Initiative.
- These activities have been extensively tested in the classroom and modified according to teacher feedback. To further this mission of stream side science education, Utah has collaborated with Montana State University

Tools for Integrated Watershed Management Outputs

- Offering currently three online graduate courses entitled, “Water Quality”, “Twelve Principles of Soil Science”, and "Stream Side Science - An Online Approach to Field-based Education."

Tools for Integrated Watershed Management Outcomes

- Help students and teachers understand how streams and lakes function within watersheds and how activities and changes in the watershed affect the health of water bodies.
- In the past four years, programs offered tools for integrated watershed management that have reached over 12,000 youth and 1,500 teachers have learned about water quality and watershed functions.
- In September 2004, Utah’s Governor Olene Walker “launched” the Stream Side curriculum and officially endorsed it as the chosen curriculum for her statewide Watershed Initiative.

The Agricultural Development in the American Pacific (ADAP)

The Agricultural Development in the American Pacific Project Introduction

The Agricultural Development in the American Pacific project, with funding through CSREES, sought ways to encourage promising individuals to “catch the Land Grant bug” early in their academic lives to make serving Pacific Island communities a career choice. The Capacity Building Project focuses on developing homegrown personnel by providing local residents with funded educational advancement.

This project addresses the need to attract and retain talented employees. It was designed exclusively for the four non-Hawaii Pacific Land Grants: American Samoa Community College, College of Micronesia, Northern Marianas College, and University of Guam. Funded training for participants will enhance the programs and impacts of the non-Hawaii Pacific Land Grant institutions

The Agricultural Development in the American Pacific Project Activities:

- Funds are provided for tuition, travel, and stipends. In return, each graduate returns home to work in the institution’s Land Grant program that funded his or her education.
- Three categories of opportunity address different levels of interest and educational progress. The first targets high school students’ awareness of opportunities in agriculture and related fields and provides interested students with small stipends to support a semester or two of on-campus learning opportunities. The second is in undergraduate support program for current Land Grant staff and faculty to start or finish their Bachelor’s degree. The last is for Masters and Ph.D. candidates who are committed to living in a Pacific Island nation and need support to upgrade their academic credentials as Land Grant personnel.
- Rigorous screening for admission by a team of Land Grant faculty, and at times, reviewers from the larger educational institution.

The Agricultural Development in the American Pacific Project Outputs:

Accepted candidates maintain academic quality throughout the support period

- Dozens of promising and talented candidates have benefited with increased knowledge and experience from the Project’s in-country, Internet-based, and study abroad opportunities.
- Many participants have returned to enhance the programs at the non-Hawaii Pacific Land Grant institutions.
- Many participants have become national leaders in various programs, thus advancing the benefits of the Project beyond the Pacific Land Grant institutions.

Paraveterinary Education and Training for the Pacific Islands through the Agricultural Development in the American Pacific Project

Paraveterinary Education and Training for the Pacific Islands through the Agricultural Development in the American Pacific Project Introduction

The Agricultural Development in the American Pacific (ADAP) Project, with funding from CSREES established a cross-Pacific team of veterinarians, animal handlers, and curriculum writers to write and design one of the most comprehensive Pacific-based animal health curricula to date. The purpose of the project was to establish a self-sustaining, Pacific-relevant distance learning program on the basics of veterinary medicine and animal husbandry, and to work with national and international partners to educate a select cadre of paraveterinarians in all 24 Pacific Island nations.

This project addresses the concern that animal doctors are unevenly distributed across the Pacific. Island countries such as Fiji and Papua New Guinea, for example, have several veterinarians, whereas the Marshall Islands has none. Through the funding of this project training will increase knowledge and make technical assistance readily available for all 24 Pacific Island nations.

Paraveterinary Education and Training for the Pacific Islands through the Agricultural Development in the American Pacific Project Activities

- The Paravet Program, a paraveterinary program of animal care basics using distance learning technology, was launched in July 2003 in Samoa.
- Students completed homework at home locations, had a week of hands-on learning, and took a comprehensive final exam. A University of South Pacific curriculum expert then evaluated the course for improvement.
- The Paravet Program moved on to the Commonwealth of Northern Marianas (CNMI) in 2004, where local and hosted students from the Marshall Islands, Pohnpei, Kosrae, Chuuk, and Palau were trained. The hurricane-battered country of Yap also received a special Paravet training course in 2004.

Paraveterinary Education and Training for the Pacific Islands through the Agricultural Development in the American Pacific Project Outputs

- Students training and curricula enhanced for the island stakeholders were made available for continuation beyond CSREES funding.

Paraveterinary Education and Training for the Pacific Islands through the Agricultural Development in the American Pacific Project Outcomes

- Students and trained gained enhanced knowledge about practices for animal husbandry.
- Collaboration enhanced in paravet training for American Samoa Community College, College of Micronesia, Northern Marianas College, University of Guam, University of Hawaii, Secretariat of the Pacific; the University of South Pacific's Institute for Research, Extension, and Training in Agriculture and international donors, including the Republic of China (Taiwan), Australia, New Zealand, and France.
- Leveraged funding support for program from the Secretariat of the Pacific (SPC) and the University of South Pacific's Institute for Research, Extension, and Training in Agriculture (USP/IRETA).

Formal Education Impacts via the Renewable Resources Extension Act FY 2007

Formal Education Impacts via the Renewable Resources Extension Act FY 2007

Introduction:

The Renewable Resources Extension Act (RREA) was passed by Congress in 1978 to “expand extension programs for forest and rangeland resources” in order to enhance the sustainability of these renewable natural resources. Sixty-nine land-grant universities provide educational programs to private forestland and rangeland owners across the nation with the support of RREA. This formal and informal education focuses on the eight RREA strategic issues: Forest stewardship and health, wildlife and fisheries resources, rangeland stewardship and health, invasive species, economic opportunities, forestland conversion and fragmentation, diverse audiences, and public policy and participation. While much of the activities under the guidance of RREA relates to landowner or informal education, our university partners are accomplishing several formal activities for K-College education and continuing professional education.

Formal Education Impacts via the Renewable Resources Extension Act FY 2007 Key Activities and Impacts

- The University of Arkansas Cooperative Extension Service is committed to educating the next generation regarding forestry, wildlife, and natural resources management by supporting the “Responsible Environmental Stewardship-Quest” or RES-Q. Annually over 200 primary schools explore natural resource issues and each of the 9,000 Project RES-Q participants represents a local community investment of \$70 per student.
- Clemson University provided professional continuing educational classes focused on the Sustainable Forestry Initiative to 135 professional loggers and foresters.
- The University of Connecticut sponsored the 10th Annual Tree Warden School and Certification Program. Thirty-two tree wardens, deputy tree wardens, and municipal engineers participated and to date 239 key municipal officials have obtained or maintained certification through this effort. The University of Connecticut is also conducting “Forest Resource Education for Municipal Officials”. This RREA National Focus Fund Initiative is educating community land-use decision-makers about the importance of forests and is promoting an approach to land-use planning that balances the need for urban development with the need for sustainable forest systems.
- The University of Delaware’s Extension Service coordinated the multi-agency Delaware ENVIROTHON, a nationally-acclaimed high school environmental education challenge, that includes eight months of training students in Aquatic Ecology, Forestry, Soils, Wildlife, and other renewable resources. More than 150 students and advisors participated in the 2007 Delaware program, with the state champions going on to place third at the International Canon Envirothon.
- The University of Hawaii, in conjunction with the USDA Forest Service Institute of Pacific Islands Forestry, designed and implemented a week-long field-based course in forest restoration. Twenty-five professional foresters from Hawaii, Guam, the Commonwealth of the Northern Marianas, Palau, and Yap participated in this training.
- The University of Illinois at Urbana-Champaign conducted a class in “Urban Timber Harvesting and Hardwood Utilization and Recovery” for 12 certified arborists and

municipal foresters. Focus of this class centered on the felling of urban trees to maximize hardwood utilization and recovery for alternative uses such as flooring, furniture, etc.

- The University of Kentucky provided state-mandated education for 976 loggers allowing 750 logging firms to maintain their certification and remain in business. In total the program has 3,536 loggers representing over 2,988 small businesses, employing over 9,200 rural Kentuckians that provided woodland owners with \$179 million in timber receipts and rural communities with over \$ 859 million through the primary processing of logs.
- North Carolina State University completed its 12th year of guiding the Natural Resources Leadership Institute. This formal training program focused on professionals who are involved in natural resources issues. Twenty-five participants increased their skills in collaborative decision-making and negotiations. The impacts of this program over its history have helped to resolve many issues at the local level as well as change processes and procedures for stakeholder involvement.
- Ohio State University provided in-service educational training to local, county, and state park professionals and state agency rural and urban foresters and wildlife biologists in 2007. Topics included Emerald Ash Borer management options, exotic invasive identification, and the utilization of i-Tree to facilitate inventory of urban forest resources.
- Oregon State University provided 60 educational workshops to over 1,600 teachers and educators throughout the state focusing on curricula from “Project Learning Tree” and “Project Wild”. This represents a potential impact on nearly 41,000 school children each year in Oregon.
- Pennsylvania State University, in association with the Max McGraw Wildlife Foundation, the Wildlife Management Institute, Colorado State University and the University of Wisconsin sponsors the Conservation Leaders for Tomorrow (CLT) education program. Started in 1995, CLT is for natural resource students who do not hunt, but will work with wildlife management clientele. It introduces students to hunting which is part of the nation’s cultural fabric. Penn State is working with West Virginia and Frostburg
- Universities to expand CLT into the Mid-Atlantic region. CLT has changed the views of young professionals and will impact resource management.
- South Dakota State University provided agricultural educators with training programs on “Using the Balanced Scorecard” and “Transformational Education for Youth Using the Range Plant 4-H Project”. This information will be used in the classroom.
- Southern University provided in-class educational opportunities and demonstrations on urban forestry to 100 students in grades K-12.
- The University of Tennessee provided formal training to 30 county extension agents at three locations focused on forestry in the wildland-urban interface. Eighty-nine percent of the professionals indicated that this training will assist them in increasing proper management in the interface regions.
- Texas A & M updated the Natural Resources Leadership Course for county extension agents. This curricula better prepares agents in developing high-quality natural resource activities for their counties.

- Utah State University provided three “Professional Tree Care” classes that were attended by 110 professional arborists and foresters. The attendees estimated that they will provide improved service to 143,215 clients this year and improved care to 85,011 trees as a result of this educational opportunity.
- Virginia Tech provided formal in-field instruction to 71 loggers who attended one of the four “Best Management & Water Quality Law” series sessions held in southwest Virginia. Sixty-six percent of the loggers increased their ability to comply with water quality laws to a greater extent.
- Washington State University educated 110 youth, mostly Latino and Native American, about water, forests, wildlife, and soils. Teachers learned along side their students and are better prepared for incorporating outdoor education ideas into their curricula.

Table 17: Economic and Community Systems (ECS) Contributions to Education Portfolio

Great Plains Interactive Distance Education Alliance (Great Plains IDEA) Family Financial Planning (FFP) Masters Degree and Graduate Certificate Program

Great Plains Interactive Distance Education Alliance Introduction:

Through Great Plains IDEA, which launched in 2003, students enroll in one institution and take online courses from eight universities in the alliance. Coursework is offered by Iowa State University, Kansas State University, Montana State University, University of Missouri, University of Nebraska, North Dakota State University, Oklahoma State University, and South Dakota State University. The master's degree includes 14 courses. Six of these covers the 89 competencies established by the CFP Board (insurance, investments, retirement planning, estate planning, personal income taxation, and fundamentals of financial planning); five courses include housing and real estate, professional practices, two practica, and case study/capstone; and three cover family concepts (family systems, family economics, and family financial counseling). The Family Financial Planning program actually began offering courses in Fall 2000. During those first three years all the agreements were worked out among Finance Officers, Registrars and Graduate Deans to allow enrollment on the home institution campus. In 2003 the common tuition price was implemented along with enrollment at the home campus and the transfer of funds for courses behind the scenes. Family financial planning is ranked as a high demand career by Jobs Rated Almanac. The Land-grant University System has the potential, but not the capacity university-by-university, to deliver degree and graduate certification programs that address the societal need for financial services professionals.

Great Plains Interactive Distance Education Alliance Key Activities:

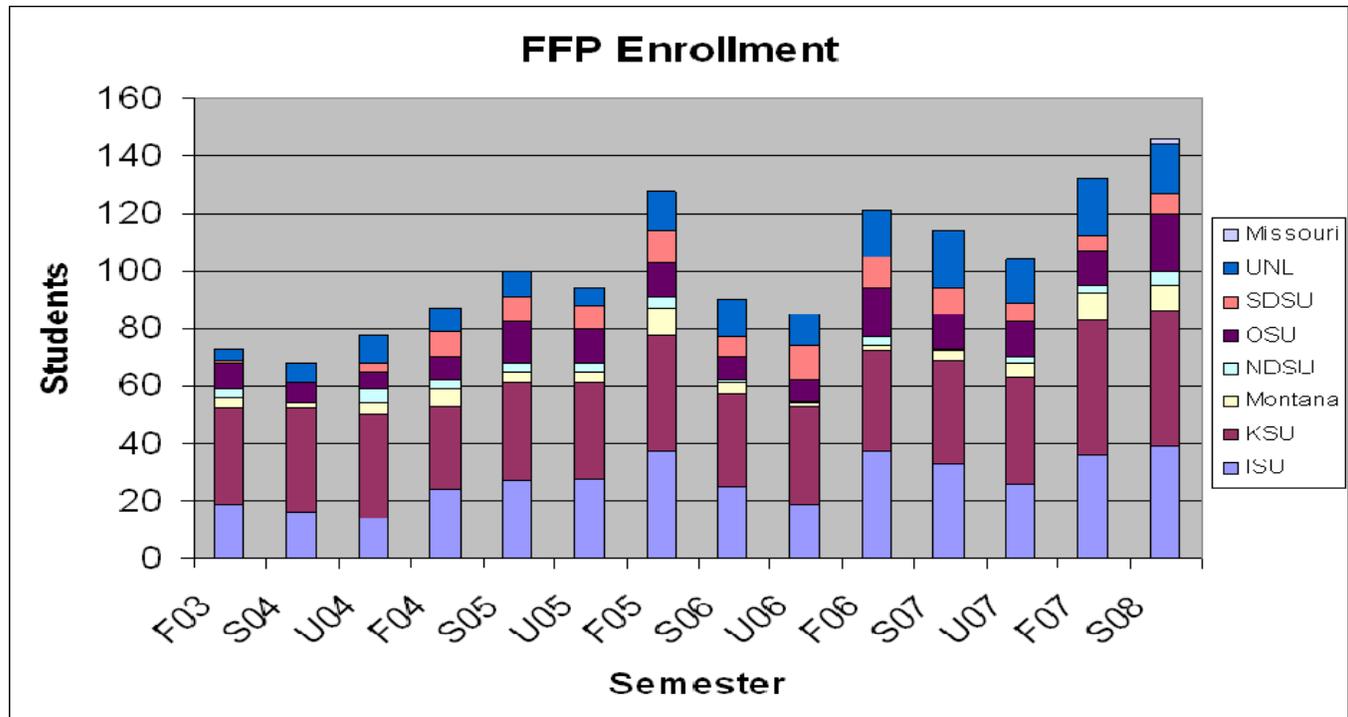
- \$5,000 CSREES non-compete grant used between 2002 and 2004 for marketing (website development, bookmarks, brochures)
- \$1,073,779 U.S. Department of Education Fund for the Improvement of Postsecondary Education grant received in 2000 for a three-year period with a no-cost extension taking the work into 2004. The grant was used to develop protocol for the alliance, using the Family Financial Planning (FFP) master's degree and graduate certificate as a model. Other academic programs would be added on seven other topics.
- Administrative meetings across eight land-grant universities to agree on tuition, academic calendar, and other details of the alliance.
- Faculty meetings to agree on curriculum, consistency in class rigor, and requirements for graduate study.

Great Plains Interactive Distance Education Alliance Key Outputs and Outcomes:

- Development of a guidebook for offering online degree and certificate programs via an alliance of universities.
- Registration with the Certified Financial Planner Board of Standards™.

- Great Plains IDEA has graduated 90 students with master’s degrees and 21 students with graduate certificates in Family Financial Planning.
- There are 191 students currently in the program, which has been registered with the Certified Financial Planner Board of Standards, Inc.™.

Data about students who have achieved the Certified Financial Planner™ (CFP) designation is not recorded. Completion of coursework prepares students to take the CFP™ exam. As the chart indicates, enrollments have steadily increased.



Sustainable Agriculture Research and Education (SARE)

Sustainable Agriculture Research and Education Introduction:

SARE supports applied research and extension in sustainable agriculture through competitive grants administered by four regions hosted by land-grant universities and steered by regional Administrative Councils. SARE reports primarily into the Farm Management portfolio under KA902 (due to SARE’s innovative administrative structure). While SARE’s legislation does not give it an explicit role in higher education, SARE contributes to the education portfolio in two ways: through SARE Graduate Student grants, and through involvement of undergraduate and graduate students in SARE Research and Education grants. In both cases, students gain experiential knowledge in planning and conducting applied research and extension in sustainable agriculture.

Subject matter (KAs) range across many fields, appropriate to SARE's broad program goal, which is to advance knowledge and practice of sustainable agriculture, which includes a wide range of production and marketing methods that enhance profitability, environmental stewardship, and quality of life.

Sustainable Agriculture Research and Education Key Activities

SARE Graduate Student Grants: These grants are offered by three of SARE's four regions (South, North Central and West). Northeast SARE is considering starting such a program, but has not yet done so. Graduate student grants awarded are as shown below.

**Graduate Student Grants Awarded under the Sustainable Agriculture
Research and Education Grants Program, FY 2002-2006**

SARE Graduate Student Grants						
Fiscal Year	Total Number of Projects	Number of Projects with Education Component	Percent of Projects with Education Component	Total Program Dollars Awarded to States	Dollars for Education Component Awarded to States	Percent of Program Dollars for Education Component
2002	19	19	100%	\$177,405	\$177,405	100%
2003	24	24	100%	\$234,797	\$234,797	100%
2004	28	28	100%	\$269,787	\$269,787	100%
2005	24	24	100%	\$223,260	\$223,260	100%
2006	32	32	100%	\$311,174	\$311,174	100%
Total	127	127	100%	\$1,216,423	\$1,216,423	100%

SARE Research and Education Grants: Research and Education (R&E) grants, which support applied research and extension projects, are SARE’s largest and longest-standing grant program in all four regions. Recent independent evaluations have documented substantial involvement of undergraduate and graduate students in SARE R&E grants. Approximately three-fourths of R&E grants employ undergraduate and/or graduate students (from 70% in the West to 82% in the South). Such projects typically involve 2-3 undergraduates and 2 graduate students each. Student involvement is more than working for wages; from 30% (in the West) to 53% (in the South) of R&E projects had students who authored or co-authored a scholarly paper or article based on the SARE project.

Extrapolating from these survey figures and SARE R&E investments provides an insight into approximate investments in experiential graduate student learning through SARE R&E projects. The data are provided on the following page.

Approximate Investment in Education under SARE funding, FY 2002-2006

SARE Research and Education (R&E) Grants						
Fiscal Year	Total Number of Projects (Actual)	Number of Projects with Education Component (est. based on evaluations)	Percent of Projects with Education Component (avg. across regions based on evaluations)	Total Program Dollars Awarded to States (Actual)	Dollars for Education Component Awarded to States *	Percent of Program Dollars for Education Component
2002	72	54	.75	\$7,447,697	n/a	n/a
2003	68	51	.75	\$8,459,782	n/a	n/a
2004	56	42	.75	\$6,366,263	n/a	n/a
2005	59	44	.75	\$6,861,264	n/a	n/a
2006	48	36	.75	\$6,144,846	n/a	n/a
Total	303	227	.75	\$35,279,852	n/a	n/a

*SARE does not track the percentage of R&E project budgets that are allocated to student wages or other student involvement.

Sustainable Agriculture Research and Education Key Outputs and Outcomes:

SARE Graduate Student Grants: The primary outputs are projects that are successfully completed by graduate students, and the contributions that those projects make to completion of the students' graduate degrees. SARE has not yet conducted a formal evaluation of this program to quantify those outputs and outcomes, but completed reports indicate that a substantial majority of grants are successfully completed. Some notable examples of students who have not only completed projects contributing to SARE's knowledge base, but have also achieved leadership recognition include:

- 2006 recipient Shoshanah Inwood of Ohio State University (Sustaining the Family Farm at the Rural Urban Interface) won a competition to give the closing plenary keynote address at a national conference
- Danielle Treadwell, who received a 2000 SARE grant for graduate work on organic sweet potatoes (www.sare.org/reporting/report_viewer.asp?pn=GS00-006), was cited for that work being particularly helpful by a national sustainable agriculture information service (attra.ncat.org/attra-pub/sweetpotato.html) and is now an assistant professor of horticulture at the University of Florida

SARE Research and Education Grants: The primary outputs and outcomes of student involvement in SARE R&E grants, from an educational standpoint, are the contributions that the experience makes to the students' education, which SARE has not yet formally evaluated. Many students have made a successful transition from undergraduate or graduate work on a SARE R&E project to a faculty position or other career. Since SARE's primary mission is research and extension, however, we have never systematically tracked such statistics. As an example, Michael Bomford, a Ph.D. student at West Virginia University from 2000-2004 who worked on the SARE-funded WVU organic systems comparison (www.sare.org/reporting/report_viewer.asp?pn=LNE02-158), took a faculty position at Kentucky State University in 2004, where he heads the KYSU program in organic vegetable production. He is also an adjunct assistant professor of horticulture at the University of Kentucky, where he co-teaches the new Introduction to Sustainable Agriculture class. In 2006 he successfully competed for a SARE Research and Education grant of \$170,000 for a study of biofumigation for soil health (see www.sare.org/reporting/report_viewer.asp?pn=LS06-185).

Table 18: 4-H and Youth Development Contributions to Education Portfolio

4-H and Youth Development Introduction:

4-H and Youth Development is Knowledge Area 806 in the CSREES classification system. It compliments and is integrated with a number of KA's in the CSREES strategic plan, including KA 802 Human Development and Well Being; KA 703, Nutrition Education and Behavior; 704, Nutrition and Hunger; and 803, Sociological and Technical Change Affecting Individuals, Families and Communities; as well as others.

This Knowledge Area addresses program development for youth, and the preparation and engagement of young people. Youth development is the natural process in which young people grow and develop. "While it occurs through youth's daily experiences with people, places and possibilities, it is far too important to be left to chance" (National 4-H Leadership Trust, 2002). Often, when young people lack positive environments and guidance, they turn to risky and negative behaviors, subsequently diminishing their potential as productive citizens.

4-H programs, with over a 100 year history, provide these positive youth development experiences to diverse populations through a large and complex system. The 4-H program combines the cooperative efforts of almost 7 million youth; the National 4-H Headquarters in the Cooperative State Research, Education and Extension Service (CSREES) of the US Department of Agriculture; volunteer leaders and professional staff; Cooperative Extension Services (CES) at 106 state land-grant universities; state and local governments; private-sector partners; state and local 4-H foundations; and the National 4-H Council. 4-H programs are conducted in the United States, Puerto Rico, Virgin Islands, Guam, American Samoa, Micronesia, and Northern Mariana Islands. 4-H-type programs are also international, with youth in more than 80 countries in similar, independent programs.

4-H, the world's largest non-formal educational program, reaches youth through a variety of delivery systems such as community-based 4-H clubs, after-school and out-of-school time programs, 4-H clubs on military bases world-wide, programs targeted to vulnerable populations, and school enrichment programs.

4-H and Youth Development Key Activities:

There are at least five broad areas in which 4-H and Higher Education Programs are aligned and linked:

- 4-H curriculum delivery through formal in-school enrichment programs
 - 4-H curriculum development and dissemination in agricultural and food sciences
 - 4-H priority on Science, Engineering and Technology (preparing young people for the 21st Century workforce)
 - 4-H prepares youth for post-secondary education and inspires them to attend college
 - Higher education trains youth workers for 4-H and other youth development programs
-
- *4-H Curriculum Delivery through Formal In-School Enrichment Programs*

4-H School Enrichment programs are aligned and linked with the purposes and goals of the Higher Education Unit and that respective Portfolio process. In school enrichment programs, Cooperative Extension Staff work with teachers in the public school system to deliver research-based, age-appropriate curriculum to supplement curriculum provided by the school system. Most 4-H curricula are linked to national educational standards and 21st Century Workforce standards.

4-H youth enrolled (numbers rounded) in School Enrichment programs are indicated for the years covered in this Portfolio Review were: 3.8 M (2002); 4.1 M (2003); 3.5 M (2005); no data are available for 2004 and 2006.

Enrollment numbers are the only type of data collected on a national level relative to 4-H School Enrichment programs. No other output or outcome information is currently being collected. Based on requirements from the Office of Management and Budget, the National 4-H Program has recently been required to modify and reduce national reporting requirements. Therefore, it is unlikely any additional information will be collected in the future about 4-H School Enrichment programs.

In addition, several states have informally reported that they are placing less emphasis on school enrichment programs and more emphasis on 4-H clubs and after-school programs. Some are finding it more difficult to have access to schools due to required classes and more emphasis on meeting national testing standards. In addition, longer-term delivery systems can usually yield stronger outcome data. Therefore, when the 2006 data is available, it is projected the enrollment numbers in school enrichment programs will be lower.

- *4-H Curriculum Development and Dissemination In Agricultural and Food Sciences*

The National 4-H Program developed 7 curriculum related to agriculture and food sciences during the time period covered by this Portfolio Review. Some curriculum was designed to be delivered in settings such as school enrichment and after-school. Other curriculum is more suited for individual learners who are guided by an adult helper along an individualized time line and learning plan. Each curriculum cost approximately \$50,000 to produce for a total investment of approximately \$350,000. Curriculum emphases were: (i) 2001 Down-to-Earth; (ii) Foods; (iii) Science Discovery; (iv) Forestry; (v) Gardening; (vi) Microwave Magic and (vii) Acres of Adventure.

- *4-H Priority On Science, Engineering And Technology (Preparing Young People For The 21st Century Workforce)*

Another primary goal and purpose of the Higher Education Unit is to prepare young people for the 21st Century Workforce. Skills in Science, Engineering and Technology (SET) are critical for young people to be able to thrive throughout this century. While SET has been a primary area of learning since the inception of 4-H over 100 years ago, starting in 2006, the National 4-H Headquarters placed a major priority in this area to bring new visibility and resources to this critical area.

Facing a Critical Challenge

Although the United States is currently the world's economic and military leader, we are at a critical juncture. In today's global economy, it is more important than ever to develop a workforce strong in science, engineering and technology. We must adapt to meet the evolving economic and national security landscape of the 21st century. At the core of this challenge is our nation's proficiency in science, engineering and technology.

Too many young Americans do not have the science, engineering and technology career skills necessary to succeed—and meet our country's needs—in the future:

- Only 18 percent of high school seniors are considered proficient in science (NAEP 2000)
- A mere 5 percent of college undergraduates earn degrees in science and engineering (Rising Above the Gathering Storm 2006)
- Only 32 percent of current U.S. college graduates are earning degrees in these fields, compared to 66 percent in Japan and 59 percent in China.

In the next decade, our nation will face a significant workforce shortage in the critical science, engineering and technology fields that will put our leadership at risk—unless action is taken. The 4-H Youth Development Program offers a solution to address the need for future scientists.

Working Toward a Solution

With 4-H and the Cooperative Extension System's (CES) direct connection to the cutting-edge research and resources of the nation's 106 land-grant universities and colleges, 4-H is strategically positioned to strengthen the U.S. global competitiveness and leadership in science, engineering and technology. The 4-H Science, Engineering and Technology (SET) program is one of three national priorities of the 4-H Youth Development Program, along with Healthy Living, and Citizenship.

4-H's Science, Engineering and Technology (SET) initiative reaches about 6 million youth annually with hands-on learning experiences that foster exploration, discovery and passion for the sciences while encouraging young minds and filling the pipeline of young leaders proficient in science. Today, 4-H out-of-school opportunities focus on areas such as agricultural science, electricity, mechanics, natural sciences, rocketry, robotics, biofuels, renewable energy and computer science.

The following enrollment numbers (rounded) by years represent youth enrolled in SET areas such as Family and Consumer Sciences, Environmental Education, Earth Sciences, Plant and Animal Sciences, Science and Technology, Biological Sciences, Engineering and Physical Sciences. In the years identified the enrollment was: 6.2 M (2002); 6.4 M (2003); 5.9 M (2006) and no data were available for 2004 and 2006.

The combination of content and context inherent in 4-H club, after-school and camp programs is proven to have a positive effect on youth, resulting in young adults who are prepared to contribute, excel, and lead in their communities and workplaces.

National 4-H Headquarters, along with its private partner National 4-H Council, has set the goal of preparing one million new young people to excel in science, engineering and technology by 2013. To complement its SET curricula, 4-H announced that National Youth

Science Day will be held on October 8, 2008, during National 4-H Week. The day will feature a National Science Experiment -- a designated science activity that will engage youth across the country.

As a public-private partnership, 4-H can focus resources and expertise through SET to:

- improve science literacy; increase the number of American students seeking undergraduate degrees in science, technology and engineering; and
- increase the number of young adults pursuing careers in these fields.

Other primary components of the national 4-H SET program include:

- Create and nationally disseminate innovative SET curriculum that supports the development of scientific literacy within the context of non-formal experientially-based instruction
- Foster and support 4-H clubs, camps and after-school programs that employ SET curriculum
- Identify a 4-H SET liaison from each land-grant institution to stay connected to state and local CES staff and volunteers
- Provide SET training for 4-H youth development professionals and volunteers

The national 4-H SET Leadership Team—drawn from all facets of 4-H and Extension—has crafted a framework for progress that outlines 4-H SET’s objectives in seven key areas: program development, professional and volunteer development, curriculum development, evaluation and research, communications, collaboration and partnerships, and funding.

This framework is based on four guiding principles that give 4-H a clear niche in the SET arena. They are:

- Science, engineering and technology learning takes place in the context of the Essential Elements of 4-H Youth Development.
- 4-H’s approach to science, engineering and technology must include youth/adult partnerships.
- Programs are based on National Standards.
- Programs are delivered in a variety of setting and locations and involve diverse audiences.

More information is available at www.national4-hheadquarters.gov. Information on the SET initiative can be found at www.4-h.org/4Hset.html.

Through federal funding and leadership for research, education and extension programs, CSREES focuses on investing in science and solving critical issues impacting people's daily lives and the nation's future. For more information, visit www.csrees.usda.gov.

- *4-H Prepares Youth For Post-Secondary Education And Inspires Them To Attend College*

The Higher Education Unit focuses on programs that support young people in obtaining post high school education. Several programs offered through 4-H focus on career exploration

and decision-making. In addition, some research and evaluation studies have found that 4-H members are more likely to have clear career goals and tend to go to college more than the general population of youth.

- *Higher education trains youth workers for 4-H and other youth development programs*

One other link between 4-H Youth Development and Higher Education is the education and training of youth development professionals. The Great Plains Interactive Distance Education Alliance (Great Plains IDEA), and other institutions of higher learning, offer certificate and degree programs in youth development. They train youth development professionals to work in 4-H and other youth development programs.

4-H and Youth Development Key Outputs and Outcomes for 4-H Programs:

CareerSmarts. North Carolina State University Cooperative Extension Service 4-H and Youth Development, conducted an evaluation of the 4th edition of *CareerSmarts*, a research-based career development program designed for use with early adolescents in voluntary youth organizations. The study evaluated both the leader training and adolescent program phases. Twenty-nine adult program presenters and 382 students, including a control group, from five counties were evaluated in four critical areas using pre- and post-test questionnaires. The evaluation concluded that the program successfully instilled such basic job seeking skills as the ability to interview successfully, writing an appropriate resume, and completing a job application form.

Seeds to Success Youth Farmstand Project, Rutgers Cooperative Research and Extension, an entrepreneurial and life skills training program, prepares at-risk special needs 14-18 year olds for the workforce. Youth are taught how to select and prepare locally grown fruits and vegetables for use in meal preparation and how to handle money and simple banking procedures. They practice workforce readiness and business skills, as they sell produce and manage a youth-run farm stand during a nine-week summer work experience. In 2004, 25 of 28 students completed the program (a 89 percent retention rate). At the end of training and at the end of the selling season, youth were tested on skills in five areas: 1) making change and processing government vouchers; 2) identifying produce; 3) using a cash register; 4) using a produce scale (and knowing equivalent weights); and 5) knowledge of produce-related measurement terms. Participants demonstrated a statistically significant improvement (alpha .05 or less) in three of the five areas: 1) making change; 2) identifying produce; and 3) using a produce scale. Total scores resulted in a statistically significant increase in skills (alpha = .014).

The Eagle's Nest/Owl's Roost Environmental Discovery program, Colorado Cooperative Extension, gives 4th and 5th grade students the opportunity to experience Colorado's natural and cultural history through hands-on, out-of-doors experiences. Colorado's Front Range communities have experienced exponential growth and development over the past few decades. Much of this growth is due to migration from other parts of the country and immigration from other countries. ENOR educates future homeowners, small acreage managers, and decision-makers about sustainable ecological techniques and wise-use practices. End-of-program survey results from 48 percent of parents and 86 percent of students were analyzed. Findings include that 100 percent of 5th grade and 98 percent of the 4th grade students identified at least one action they would take to help the environment. Participants also identified one practice (skills

such as compass reading, safely observing wildlife, and environmental education games and activities) they would teach or share with their families.

In *De Soto Parish, Louisiana*, 46 children in grades K- 6th participated in the **YES** program. Thirty-six children in the 4th grade involved in standardized testing receive intense tutorial programming in math and language arts by Southern University CYFAR staff. The children participating in this tutorial after-school program were identified by school administrators. These 36 students have repeated a grade more than one time. Of the ten participants in the program who had either failed or scored in the lowest passing percentile in the Louisiana Educational Achievement Program (LEAP) standardized test in 4th grade, all passed and did not have to repeat the fourth grade.

All the students surveyed believed they learned math skills, 70% stated that the program helped them with the LEAP test this spring and summer, and 85% reported being better able to solve reading problems, multiply, divide and subtract.

A professional development travel exchange between Oregon 4-H Agents and Australian school teachers led to the development of Corroboree, 4-H Across the Seas Science Education Website, Oregon State University Extension and the Oregon 4-H Center. Participants in this web-based science education program are youth engaged in 4-H science clubs using outdoor classrooms with five schools in Oregon and Australia. Students liked the pictures and graphics on the web site; the organization of the web site lessons; and the ease of use of the on-line data collection pages. Evaluation results show statistically significant changes in using the web to learn science ($p = .072$; $N=69$) and liking to learn about people from other countries ($p = .043$; $N=66$).

The *Cyber Town* program, *University of Maryland Cooperative Extension Service*, Woodrow Wilson Community Center, targeted youth who lived in an area with limited access to technology, attending schools without an Internet connection. Community members -- teachers, parents, and business leaders -- did not want youth to fall behind, so an after-school program was initiated that taught youth computer skills. Many participants were found to lack critical reading and comprehension skills. The Cyber Town program was modified to address these issues as well: youth worked to increase their computer literacy, their ability to complete homework, and their reading comprehension. They also learned how to use E-mail and the Internet. Program evaluators used pre- and post-testing to measure age-appropriate reading comprehension. Pre-test scores showed a mean of 52 percent with a standard deviation of 22. Post-program mean scores were 73 percent ($SD=8$), an overall increase by 21 percent. Teachers reported that participants were better behaved and submitted more complete and accurate homework. Cyber Town participants also had fewer referrals to the school principal than non-participants. Report cards showed continual increases in GPA over a nine-month period.

Attitudes for Success, Oregon State University-Umatilla County

The Attitudes for Success Youth Leadership Program was developed to provide opportunities for Hispanic youth to develop life skills and to be involved in their communities. As 30% of Hispanic high school students drop out of school in the Umatilla/Morrow Education Service District, the program provides information about community leadership and college opportunities. The program includes an annual daylong leadership/college preparation conference, and a youth leadership board providing intensive leadership opportunities on a monthly basis. Oregon State University reports that five communities created school-based multi-cultural leadership clubs to enhance diversity, and former graduates who've attended college have returned to speak to the students about the impact of the program and the

importance of college. Schools provide student release time, busing, and faculty support so that youth may participate in the program. Of the more than 4,300 Hispanic youth who have participated, 86% reported the program helped them gain leadership skills, and 95 percent indicated their involvement increased their likelihood to attend college. See <http://www.national4-hheadquarters.gov/about/pod-leadership/attsuccess.pdf>

Penn State Study

Radhakrishna (2004) researched alumni of 4-H programs in Pennsylvania. He found that skills learned in 4-H continue to influence 4-H participants in later life and career experiences. Pennsylvania 4-H alumni who were members of other youth organizations view 4-H as most helpful in teaching subject matter skills, communication skills, teaching responsibility, and participation in community activities. Enrollment in 4-H and completing 4-H projects contributed to leadership development, decision making skills, communication skills, and willingness to take responsibility.

4-H Positive Youth Development Study

The 4-H Study of Positive Youth Development (Lerner et al., 2008) is a longitudinal study that began with 1719 fifth grade youth during the 2002-2003 school year and 1137 of their parents. Study results indicate that 4-H youth:

- Were more than one and a half times more likely to expect to go on to college than non 4-H youth.
- Had higher school grades and were more emotionally engaged in school than non-4-H youth.
- Scored significantly higher than those youth who did not participate in 4-H on six of eight factors related to Civic Identity and Civic Engagement.

Table 19: National Research Initiative Competitive Grants Program (NRI) contributions to Education Portfolio

National Research Initiative Competitive Grant Program Introduction

The National Research Initiative (NRI) Competitive Grants Program is the largest competitive grants program offered through CSREES. The NRI was established in 1991 to increase the competitiveness of U.S. agriculture; improve human health and well-being through an abundant, safe, and high-quality food supply; and sustain the quality and productivity of the natural resources upon which agriculture depends. Both basic and applied research and integrated research, education, and extension programs are supported by the NRI. Although the NRI did not have a specific authority to support educational programs until 2003, the NRI is successful in fostering the development of future scientists within basic and applied research programs. Therefore, the majority of educational training that is provided by the NRI is graduate student training and experiential learning within individual research projects. The NRI contributed to the preparation of the next generation workforce for agriculture with comprehensive training and education of researchers, practitioners, teachers, and policy makers.

In fiscal year 2003, Congress directed the NRI to expand its interest beyond those set during the program's inception to incorporate education and extension components. The purpose of NRI Integrated Programs is to support research, education, and extension grants that address critical emerging U.S. agricultural and rural issues. Integrated projects hold the greatest potential to produce and transfer knowledge directly to end-users, while providing for educational opportunities to assure agricultural expertise in future generations.

Coordinated Agricultural Project (CAP) awards support large-scale, multi-million dollar projects to promote collaboration, open communication, and the exchange of information; reduce duplication of effort; and coordinate activities among individuals, institutions, states, and regions. Like integrated projects, CAP projects conduct targeted research, education, and extension in response to critical and emerging national priorities and needs. These long-term investments support discovery and applications, and promote communication leading to innovative science-based solutions. In turn, CAP awards provide returns that impact American's daily lives, further demonstrating how CSREES' investment in science secures tomorrow's agricultural future.

The tables on the following pages provide an overview of educational training support provided to graduate students by the NRI for the period of the portfolio review.

NRI Graduate Student Educational Training Support (ETS), FY 2002-2006.

Topic Area	Total Number Grants of Awarded	Total Dollars Awarded	Number of Grants Awarded with ETS	Total Dollars Awarded to Grants with ETS	Number of Graduate Students with ETS
<i>FY 2002</i>					
Markets, Trade, and Rural Development	39	\$3,914,400	24	\$2,808,300	35
Animal Sciences	125	\$25,373,740	48	\$10,976,419	67
Nutrition, Food Safety, and Health	59	\$15,869,770	26	\$5,580,391	33
Enhancing Value and Use of Agricultural and Forest Products	57	\$8,700,000	33	\$5,501,250	42
Biology and Management of Pests and Beneficial Organisms	98	\$17,585,000	47	\$9,758,662	58
Natural Resources and Environment	86	\$16,758,000	45	\$10,649,537	74
Plant Sciences	125	\$16,129,357	41	\$7,175,568	50
<i>Total</i>	589	\$104,330,267	264	\$52,450,127	359
<i>FY 2003</i>					
Markets, Trade, and Rural Development	29	\$3,960,127	20	\$2,943,785	27
Animal Sciences	122	\$25,155,772	42	\$10,019,553	46
Nutrition, Food Safety, and Health	74	\$23,402,284	45	\$15,879,742	58
Enhancing Value and Use of Agricultural and Forest Products	73	\$11,128,965	48	\$8,307,873	62
Biology and Management of Pests and Beneficial Organisms	105	\$17,734,713	50	\$9,107,306	63
Natural Resources and Environment	105	\$21,857,464	56	\$14,436,965	80
Plant Sciences	108	\$18,932,131	40	\$7,577,664	47
<i>Total</i>	616	\$122,171,456	301	\$68,272,888	383
<i>FY 2004</i>					
Markets, Trade, and Rural Development	19	\$6,417,800	10	\$3,800,800	24
Animal Sciences	104	\$26,049,809	44	\$16,119,773	87
Nutrition, Food Safety, and Health	62	\$21,836,717	26	\$17,002,418	61
Enhancing Value and Use of Agricultural and Forest Products	55	\$11,355,149	37	\$9,801,788	78
Biology and Management of Pests and Beneficial Organisms	76	\$18,372,600	39	\$15,361,849	44
Natural Resources and Environment	74	\$21,496,214	42	\$15,851,029	63
Plant Sciences	89	\$17,716,000	40	\$11,788,915	47
<i>Total</i>	479	\$123,244,289	238	\$89,726,572	404
<i>FY 2005</i>					
Markets, Trade, and Rural Development	26	\$7,099,794	13	\$3,483,058	20
Animal Sciences	89	\$24,303,989	39	\$13,581,764	51
Nutrition, Food Safety, and Health	52	\$24,304,283	20	\$13,201,135	31
Enhancing Value and Use of Agricultural and Forest Products	52	\$14,176,913	39	\$12,391,289	61
Biology and Management of Pests and Beneficial Organisms	74	\$19,588,634	31	\$9,759,750	40
Natural Resources and Environment	70	\$22,078,625	41	\$14,892,115	59
Plant Sciences	79	\$20,097,000	39	\$16,380,684	72
<i>Total</i>	442	\$131,649,238	222	\$83,689,795	334
<i>FY 2006</i>					
Markets, Trade, and Rural Development	26	\$8,847,044	8	\$3,009,712	15
Animal Sciences	102	\$30,199,314	55	\$23,803,751	73
Nutrition, Food Safety, and Health	57	\$23,436,200	16	\$8,870,616	28

Topic Area	Total Number Grants of Awarded	Total Dollars Awarded	Number of Grants Awarded with ETS	Total Dollars Awarded to Grants with ETS	Number of Graduate Students with ETS
Enhancing Value and Use of Agricultural and Forest Products	55	\$14,103,136	30	\$9,543,208	45
Biology and Management of Pests and Beneficial Organisms	75	\$20,847,814	45	\$17,816,319	51
Natural Resources and Environment	74	\$21,412,786	37	\$12,480,942	60
Plant Sciences	71	\$22,095,000	23	\$10,513,901	27
Total	460	\$140,941,294	214	\$86,038,449	299
Grand Total	2586	\$622,336,544	1239	\$380,177,831	1779

NRI Graduate Student Educational Training Support (ETS), FY 2002-2006 by Topic Area.

Topic Area		Total Number Grants of Awarded	Total Dollars Awarded	Number of Grants Awarded with ETS	Total Dollars Awarded to Grants with ETS	Number of Graduate Students with ETS
Markets, Trade, and Rural Development						
	2002	39	\$3,914,400	24	\$2,808,300	35
	2003	29	\$3,960,127	20	\$2,943,785	27
	2004	19	\$6,417,800	10	\$3,800,800	24
	2005	26	\$7,099,794	13	\$3,483,058	20
	2006	26	\$8,847,044	8	\$3,009,712	15
Total		139	\$30,239,165.00	75	\$16,045,655.00	121
Animal Sciences						
	2002	125	\$25,373,740	48	\$10,976,419	67
	2003	122	\$25,155,772	42	\$10,019,553	46
	2004	104	\$26,049,809	44	\$16,119,773	87
	2005	89	\$24,303,989	39	\$13,581,764	51
	2006	102	\$30,199,314	55	\$23,803,751	73
Total		542	\$131,082,624.00	228	\$74,501,260.00	324
Nutrition, Food Safety, and Health						
	2002	59	\$15,869,770	26	\$5,580,391	33
	2003	74	\$23,402,284	45	\$15,879,742	58
	2004	62	\$21,836,717	26	\$17,002,418	61
	2005	52	\$24,304,283	20	\$13,201,135	31
	2006	57	\$23,436,200	16	\$8,870,616	28
Total		304	\$108,849,254.00	133	\$60,534,302.00	211
Enhancing Value & Use of Ag/Forest Prod						
	2002	57	\$8,700,000	33	\$5,501,250	42
	2003	73	\$11,128,965	48	\$8,307,873	62
	2004	55	\$11,355,149	37	\$9,801,788	78
	2005	52	\$14,176,913	39	\$12,391,289	61
	2006	55	\$14,103,136	30	\$9,543,208	45
Total		292	\$59,464,163.00	187	\$45,545,408.00	288
Biology/Management of Pests						
	2002	98	\$17,585,000	47	\$9,758,662	58
	2003	105	\$17,734,713	50	\$9,107,306	63
	2004	76	\$18,372,600	39	\$15,361,849	44
	2005	74	\$19,588,634	31	\$9,759,750	40
	2006	75	\$20,847,814	45	\$17,816,319	51
Total		428	\$94,128,761.00	212	\$61,803,886.00	256
Natural Resources and Environment						
	2002	86	\$16,758,000	45	\$10,649,537	74
	2003	105	\$21,857,464	56	\$14,436,965	80
	2004	74	\$21,496,214	42	\$15,851,029	63
	2005	70	\$22,078,625	41	\$14,892,115	59
	2006	74	\$21,412,786	37	\$12,480,942	60
Total		409	\$103,603,089	221	\$68,310,588	336

Topic Area	Total Number Grants of Awarded	Total Dollars Awarded	Number of Grants Awarded with ETS	Total Dollars Awarded to Grants with ETS	Number of Graduate Students with ETS
Plant Sciences					
2002	125	\$16,129,357	41	\$7,175,568	50
2003	108	\$18,932,131	40	\$7,577,664	47
2004	89	\$17,716,000	40	\$11,788,915	47
2005	79	\$20,097,000	39	\$16,380,684	72
2006	71	\$22,095,000	23	\$10,513,901	27
Total	472	\$94,969,488	183	\$53,436,732	243
Grand Total	2,586	\$622,336,544	1,239	\$380,177,831	1,779

SUMMARY TABLE BY YEAR					
YEAR	Total Number Grants of Awarded	Total Dollars Awarded	Number of Grants Awarded with ETS	Total Dollars Awarded to Grants with ETS	Number of Graduate Students with ETS
FY 2002	589	\$104,330,267	264	\$52,450,127	359
FY 2003	616	\$122,171,456	301	\$68,272,888	383
FY 2004	479	\$123,244,289	238	\$89,726,572	404
FY 2005	442	\$131,649,238	222	\$83,689,795	334
FY 2006	460	\$140,941,294	214	\$86,038,449	299
GRAND TOTAL	2,586	\$622,336,544	1,239	\$380,177,831	1,779

Key National Research Initiative Integrate Programs

JDIP CAP: Johne's Disease Integrated Program

Johne's Disease infects large numbers of beef and dairy cattle and accounts for more than \$200 million in economic losses each year. The objectives of the Johne's CAP are to enhance knowledge, promote education, develop real-world solutions, and mitigate losses associated with Johne's Disease.

Considerable focus has been placed on supporting graduate and post-doctoral students through the Johne's Disease Integrated Program (JDIP) CAP. On an annual basis, approximately seven students are fully or partially supported through the CAP program. Annual travel awards are made to graduate and post doctoral students to facilitate their attendance at the JDIP Annual Conference. Three travel awards of \$2,500 each were also provided for graduate and post doctoral students to facilitate their attendance at the 9th Annual International Colloquium on Paratuberculosis. Overall, JDIP funded projects routinely include funding for graduate students and post-doctoral scientists in order to develop and mentor the next generation of researchers with an interest in animal agricultural research including Johne's disease.

"Tools for Infectious Disease Epidemiology: Diagnosis, Modeling and Risk" workshops have been held at Cornell University and at Cairns, Australia (in conjunction with the International Symposium on Veterinary Epidemiology and Economics). Graduate and post doctoral students are one of the target audiences for these sessions, and JDIP provided partial support for members who attended the sessions.

Improved understanding of the disease's transmission cycle led to alternative sampling and testing strategies to detect infected animals. In addition to reducing disease detection time, the research identified genes, proteins, and lipids in disease bacteria that will guide the next generation of diagnostics and vaccines.

An Integrated Approach to Development and Application of Precise Methods of Estrous Cycle Control for Beef Heifers and Cows

Artificial insemination (AI) is a procedure used in animal breeding that has been available to the livestock industry for the past 60 years. Use of AI results in rapid improvement of livestock for important production traits because superior males can be bred to many more females with AI than with natural service. This procedure, however, has not been readily adopted by the beef industry due to the time and labor associated with its use; therefore, progress on genetic improvement of beef cattle has been very slow. The focus of this project was to support efforts in the transfer of technology that will enhance successful adoption of estrous synchronization and timed-AI; support improvements in whole-herd reproductive management; and support successful integration of the accomplishments in research of methods to control the estrous cycle in postpartum beef cows into everyday practice by the beef cattle industry.

This project developed a comprehensive educational training program/curriculum that supports broader understanding, application, and utilization of estrous synchronization and AI in the U.S. beef cattle industry. The curriculum will be available through the National Cattlemen's Beef Association National Cattle Learning Center (www.cattlelearningcenter.org) and used in courses at the University of Missouri. A reproductive management internship program for undergraduate, graduate, and veterinary students was also developed. This internship program will provide students with practical training in the development and execution of estrous synchronization and AI programs and provide extensive hands-on experience in estrous synchronization, estrous detection, semen handling, and AI. With these programs, students will acquire new knowledge and skills pertaining to estrous cycle control in cattle and effective management of breeding programs involving estrous synchronization and AI. Students that acquire new knowledge and skills pertaining to estrous cycle control in cattle will aid in the successful adoption of existing biotechnologies involving estrous synchronization and AI.

The project developed a new timed-AI procedure that boasts a 64 percent success rate in conception rates with beef heifers after the first mating of the season, a success rate that is similar to natural service but permits more rapid genetic improvement. Incorporating timed-AI programs into the livestock production process will allow greater flexibility and time for other tasks on the farm. It also provides a greater level of success of livestock mating. In turn, producers will see an increased profit in their beef operations stemming from improved marketing opportunities that occur as a result of improvements in reproductive management and expanded use of superior genetics.

Forestry and Community: Creating Local Markets for Local Resources

Many limited resource landowners in the South have little or no opportunity to market their harvested timber because contemporary logging operations require larger parcel sizes to economically justify harvests. As a result, many forestland owners both suffer loss of income and have fewer options available for managing their timber. This project was designed to create market opportunities, and thereby expand forest management options available to owners of small forestland parcels. These objectives will be accomplished by identifying scale appropriate harvesting and wood processing technologies as well as local market opportunities.

Four Auburn University architecture students designed and constructed a low-cost home for a low-income family using locally produced structural timbers. The project collaborated with Rural Studio (www.ruralstudio.com) education program, School of Architecture, Auburn University, and created plans to focus an entire curriculum program on design and construction of low-cost houses using local materials for the 2008-2009 academic year. These programs were created to train students to design and construct various types of housing and home renovation projects that utilize locally-produced construction materials, including both conventional and non-conventional poles and lumber. As part of their project-supported training, seven graduate students completed research in rural sociology and forestry programs. A portion of the research focused on issues related to housing policy, including state and federal housing improvement programs. Other research identified where both small tracts of forestland and substandard housing exist in the southeastern U.S. and focused on microenterprise development associated with scale appropriate timber harvesting and wood processing technologies.

Student-Centered Web-Based Communities: Multidisciplinary Approach for Adolescent Obesity Prevention

Prevalence of obesity in children and adolescents has doubled in the past 30 years in the U.S. To encourage the achievement of healthy weights, this project was designed to develop an interactive web-based learning community for sixth grade students. The students' task was to form a national plan to address the overweight epidemic. The web-based approach will allow distribution across the United States.

Adolescents in the 6th grade entered into intervention sites in Indiana and Arizona. Students then developed an interactive web-based learning community based on the social ecological model to provide a multidimensional intervention for their peers. The results of this project formed the basis of a web-based educational program, called Eat, Move, Learn, that will be made available throughout the country. The Eat, Move, Learn program consists of four modules and 13 lessons that can be used individually or sequentially and downloaded for classroom use (www.eatmovelearn.org).

Students participating in the program improved their knowledge of the benefits of physical activity and of eating a healthy diet. Students also learned about the scientific method of inquiry, how to collect and analyze data, and how to publish and present their findings and conclusions. Students participating in the Eat, Move, Learn program significantly increased their levels of physical activity (measured in steps/day) compared to controls. Observations from teachers participating in the program indicate that student participants also improved their academic performance. Long-term increases in physical activity will reduce the prevalence of overweight and obesity in adolescents, and eventually adults.

Source-Sink Dynamics in Grassland Bird Populations Across Great Plains Prairie Dog Colonies: Implications for Biological Diversity and Livestock

This integrated project builds on a research project to study the effects of land use and management changes on the dramatically declining populations of nomadic, grassland birds that spend their winters in the Chihuahuan desert of the southwestern United States and northern Mexico. By studying their food supply – grass seeds – faculty and students are learning how precipitation patterns, grazing pressure, soil conditions and shrub encroachment affect seed production. Undergraduate students place seed traps to collect and then identify the variety of seeds produced in the desert ecosystem. The seed study will help researchers understand how

environmental conditions and land management affect winter sparrow food supplies. The goals of the research project are to learn more about the winter ecology of these declining species and to make recommendations for sustainable land management.

This integrated project is more inclusive in looking at the effects of various management scenarios for grassland birds on livestock production. This project will train graduate and undergraduate students in interdisciplinary approaches to ecology and management at an ecosystem scale through innovative experiential learning opportunities, including an international perspective, and curriculum revision. Through hands-on learning, students will be introduced to activities related to careers in research and public service. This project will train four graduate students and 12-15 undergraduate students annually in field research through a spring seminar for all participating students and summer research experiences.

BarleyCAP: Leveraging Genomics, Genetics and Breeding for Gene Discovery and Barley Improvement

The objective of the BarleyCAP is to develop genomic tools and methods in barley breeding programs that will help breeders identify agronomic and economically important genes, thereby producing superior barley crops. The new crops will include improvements in food and malt quality, as well as disease resistance.

Twenty-one graduate students, three postdoctoral research associates, five technical personnel, 13 undergraduates, one visiting professor and two high school students have or are currently actively working on the barley CAP. These individuals have been involved in research as well as outreach and extension activities as part of the project's goal to educate the next generation of plant breeders. Workshops are being developed that address the major theoretical and practical approaches to association genetics and marker-assisted selection. Barley CAP is using these planned workshops to develop graduate student teaching modules. The modules will be developed for the Web and will also be placed on the BarleyCAP website and made publicly available. BarleyCAP participants at various institutions will facilitate incorporation of the modules into graduate level plant breeding courses. Barley CAP principles and approaches have been incorporated into a graduate level course at the University of Minnesota and an undergraduate course at Oregon State University. Barley CAP has also collaborated with the WheatCAP on a "Combine to Kitchen Tour". Participating students toured the NDSU Barley and Malt Quality Lab, a barley field, and a malt plant, and learned many aspects of barley growing, malting, and brewing.

New technology to examine the barley genome enables researchers to locate genes of agriculturally important traits (disease resistance, high yield, food quality, etc.). This information will make the breeding process more efficient and effective.

RiceCAP: A Coordinated Research, Education, and Extension Project for the Application of Genomic Discoveries to Improve Rice in the United States

Rice is the primary food source for much of the world and an important component of U.S. agriculture. Investing in research that can improve yields and the nutritional level of rice will take society one step closer to ending famine in the developing world and open new opportunities for America's rice industry. The objectives of the RiceCAP are to improve rice crops by sequencing the rice genome; build a community of researchers and extension agents to

explore the uses and application of the genetic map; and educate the public on the benefits of applying the genome information to improve agricultural crops.

The objective of the training portion of the RiceCAP effort was to develop technical training programs and resources to ensure implementation of molecular marker and gene validation technologies to solve rice problems. Overall, RiceCAP has created training opportunities through workshops for 25 graduate students, 15 undergraduate students, 16 postdoctoral research associates, and 41 technical personnel or through direct support for nine graduate students, seven undergraduate students, 14 post doctoral students, and 23 technical personnel. As part of the technical training aspect of RiceCAP, four highly popular workshops were held. The workshops were attended by 25-100 participants from 14 U.S. institutions representing the major public and private rice breeding and research programs in the U.S. The Lab Encounters workshop was for science and agriculture teachers of grades 5-12 to introduce methods and applications of genomic plant research, especially as they apply to the RiceCAP project.

The International Rice Genome Sequencing Project completed a draft sequence of the rice genome, a key resource in improving the nutritional quality and productivity of rice. The map-based sequence led to the identification of genes responsible for important traits that affect growth and promote higher yields. An increase in yields will help feed an expanding world population at a time of increasing restraints on agriculture.

WheatCAP: Wheat Coordinated Agricultural Project

Twenty percent of all calories consumed globally come from wheat-derived foods, such as bread and pasta. The research of the WheatCAP offers a potential solution to nutrition deficiencies affecting hundreds of millions of people around the world. The objective of the project is to advance technology to rapidly identify genes that may produce higher quality, disease-resistant wheat.

Wheat CAP education activities include: formal training courses on mapping and quality trait loci analyses; "Combine to Kitchen" educational trips that increase student appreciation of job opportunities in agriculture; a marker assisted selection (MAS) workshop for Future Farmers of America; a MAS demonstration at a meeting of Montana Tribal Colleges Science Teachers; and educational and recruiting animations for plant breeding and MAS posted on wheat CAP educational page: <http://maswheat.ucdavis.edu/Education/index.htm>. During the project's first two years, participants of WheatCAP trained 16 high school students, 59 undergraduate students, and 50 graduate students on wheat breeding and marker assisted selection (MAS).

Researchers successfully cloned a gene that controls protein, iron, and zinc levels in wheat, enhancing nutritional value by 10 to 15 percent and accelerating grain maturity.

Table 20: Educational Contributions of Cross-Unit Programs

Section 406 Integrated Programs

CSREES uses the statutory authority in Section 406 (7 U.S.C. 7626) of AREERA to fund integrated, multifunctional agricultural research, education, and extension activities. The expectation has been that the overall approach to solving critical agricultural issues, priorities, or problems will be through an integration of research, education, and extension activities, through any combination thereof.

Evans-Allen Grant Program

Evans-Allen Grant Program Introduction

Eligible Institutions are required to propose and conduct research projects supported with Evans-Allen Funds which comply with the purposes of Sections 1402 and 1445 of the National Agricultural, Research, Extension, and Teaching Policy Act of 1977, as amended, which have relevance to the special conditions and needs of the respective States. The CSREES strategic goals complement the planning efforts of USDA. In administering Evans-Allen funds, CSREES is responsible for major USDA extramural programs that sustain high-quality education, research, and extension initiatives.

The scope of research conducted under Evans-Allen is very broad. During the period covered by this review, research activities covered all aspects of agriculture, including soil and water conservation and use; plant and animal production, protection and health; processing, distributing, marketing, and utilization of food and agricultural products; forestry, including range management and range products, multiple use of forest and rangelands, and urban forestry; aquaculture; home economics, including human nutrition and family life; and rural and community development. Research activities addressed problems of local, state, regional, or national concern. Approximately \$180 million have been distributed from Fiscal Years (FY) 2002 through FY 2006. (Table 1)

As a result, the effectiveness of programs at the 1890 land grant institutions in research, extension and education has increased because of the Evans-Allen program. New cutting edge research technology has been applied to respond to the needs of stakeholders, extension outreach services have significantly been enhanced, and experiential learning opportunities have improved as well.

Funding awarded to states under Evans-Allen, during FY 2002 – 2006.

FY	Total Projects	Total Program Dollars Awarded to States
2002	47	\$34,604,000
2003	29	\$35,411,000
2004	61	\$35,788,000
2005	42	\$36,704,000
2006	65	\$37,215,000
Total		\$179,722,000

Evans-Allen Grant Program Key Activities

- The University of Arkansas Pine Bluff has developed techniques on determining viral diseases in tropical fish. As a result of these studies, farmers have made significant changes in biosecurity and culture methods that will reduce the risk of fish disease.
- Florida A&M University scientists are identifying DNA transcripts and metabolites associated with disease and drought tolerance characteristics of grape, and also, for improving value-added traits of muscadine and bunch grape genotypes.
- Scientist at the University of Maryland Eastern Shores are characterizing soybean and corn genotypes as hyper accumulators for removing phosphorous (P) from soil.
- Kentucky State University is investigated the profit potential of farm raised prawn and hybrid striped bass locally and in neighboring states. Aquaculture promises good returns for small-scale farmers in this region.

Evans-Allen Grant Program Key Outputs and Outcomes

- Establishment of Aquaculture Research and Technology Centers
- Doctoral programs established (Plant and Soil Science and Food Science)

Other Education Outputs and Outcomes

The Plan of Work and Annual Report submitted by states to CSREES, and past portfolio reviews represent an additional source for education activities from CSREES funding. As currently reported, there is difficulty in determining direct attribution of outcomes. However, the funding from CSREES does influence education activities in the states. The reported educational activities are included in this self study for the education portfolio to reflect that influence through: New or modified curricula; Student scholarships and stipends; Professional development for faculty members; Development of new teaching methods and Conduct CSREES Education Program Reviews. Below are examples of educational outputs and outcomes from other CSREES funded programs that contribute directly and indirectly to the education mission.

The Center for Applied Rural Innovation - at the University of Nebraska-Lincoln collaborated with connecting Nebraska Technology Team and the Southern Rural Development Center at Mississippi State University on research funded by the USDA Pilot Rural Economic Development Initiative. Their 2004 research report, "E-Commerce in Nebraska: A Survey of Business Technology Use," is being used in 2005 and beyond to evaluate programs and identify new directions.

The E-commerce Competitive Grants Program - in FY 2006 (“Round Two”) filled important gaps identified as a result of this program in the e-commerce educational programs of Extension. Priority topics for 2006 awards included building an e-Strategic plan; strengthening business-to-business e-commerce transactions; strengthening government-to-government activities; expanding global e-commerce; and inventorying ecommerce small business successes. The Regional Rural Development Centers (RRDCs) and their land grant university partners link the advances from the Rural e-Commerce Extension Initiative to the emerging National Rural Entrepreneurship Initiative during 2005 and beyond. For example, the SRDC held a May 2005 training, “*Entrepreneurship and e-Commerce: Building and Expanding Economic Opportunity.*” It integrated the building blocks of rural entrepreneurship with current e-Commerce topics, practices, and internet-savvy techniques. Trainers were outstanding Extension small business and technology experts and rural entrepreneurship development experts from across the country who collaborated to develop educational resources and tools to help entrepreneurs use e-Commerce applications. This linkage between e-Commerce and entrepreneurship promises to expand rural economic development opportunities and support a more robust and prosperous rural economy. The e-Commerce searchable online library will be expanded to support this linkage. This new direction illustrated the links between Theme B: Rural Economy and Theme D: Social, Technological, Demographic Change and Community Response.

Business Management, Finance and Taxation - The educational activities were aimed at improving the incentives for doctoral and masters candidates to develop experience and knowledge in agricultural arenas that have been deemed to be national priorities, such as agribusiness management, markets and trade policy, and information systems specific to agricultural challenges. Furthermore, educational programs were redesigned to provide opportunities for minority students to build relationships with faculty and to enter entrepreneurship tracks in MBA programs. While most educational aspects of taxes and tax law are often handled in the business schools of our universities, a number of institutions have in place business related programs in the colleges of agriculture.

Many extension activities were also directed toward outreach to minority groups and underserved/entrepreneurs and sought to help them reduce financial risk when they developed business plans, especially when these plans involved the development of easier credit, or the use of crop and livestock insurance products. The Tax Extension Committee provides input to both the IRS and the Joint Congressional Tax Committee thereby providing U.S. producers a better understanding of new tax requirements as well as their impacts.

Education and outreach to minority and underserved farmers and entrepreneurs concerning the mitigation of financial risk through the development and implementation of business plans. This includes the development of financial plans and the communication of alternative crop, livestock and other insurance products.

- Education for producers that may improve their knowledge of human risk issues to increase safety and reliability of the labor force.
- Education for lenders about farm financial risks that may enhance the availability of affordable credit to producers.

Credit Education and Risk – In the short-term, faculty from the University of Arkansas examined the knowledge gap between poultry contract growers in four states and their contractors (commonly referred to as “integrators” or poultry integrated firms). They developed a data

collection method and an improved set of analytical tools to assess such things as annual net farm income, cash flow, returns to management and equity capital.

This new knowledge assisted growers and integrators in contract negotiations. It provided them with a consistent baseline of comparison for use by lending institutions, and a more precise tool to evaluate loan applications for enterprise establishment or expansion. Additionally, the broiler producers and the integrators can utilize these new tools to better compare costs and returns and evaluate the future state of the existing industry and opportunities for expansion.

Student Research at Land-Grant Institutions in Food Processing and Bio-based Products - Research at land-grant and other institutions of higher learning complements the education mission of the institutions. Majority on the faculty at these institutions have teaching and research responsibilities. Undergraduate and graduate students working with faculty members gained valuable research experience in food and nonfood product related foods.

The Food Science and Technology Extension Program at the University of Nebraska operated through 2.5 to 3.0 FTE commitment of effort. The objectives were broad and encompassed Agricultural Competitiveness and Profitability, Youth Development, and Food Safety. Food processing and product development is one of the most successful outreach programs in the country, partially due to the presence of nationally known Food Processing Center well connected with the food processing Industry. Outreach and educational programs were focused to achieve long-term behavior and attitude changes among consumers, food processors and food handlers, and producers. CSREES funded several activities of the Department in this area through Special Research grants and Competitive grants programs. The University has been able to successfully raise more than dollar-for dollar matching funds from private sources.

The proportion of portfolio education funding was greater than the research proportion over the reporting period. The actual dollars as well as the percentage of the overall education allocation has increased every year during the reporting period. Because all of the education programs are competitively funded, these increases may have been the result of simply more forest, range, fish and wildlife resources education proposals being submitted and/or better and more competitive proposals being submitted. With more accurate PA classifications being used by the SERD unit over the last two years, more accurate data will be available for future portfolio reviews.

The University of Florida - School of Forest Resources and Conservation, assisted by the University of Georgia and Auburn University, has developed Internet-delivered agroforestry courses to increase the number of students able to experience agroforestry practices and improve the level of scientific understanding of eco-tourism/environmental issues. These courses reach a wider potential base of students than traditional, resident-instruction courses. By the end of the project, 120 students are expected to have enrolled in the newly-developed courses. Agroforestry demonstration sites will be visited by four University of Florida undergraduate classes per year to reinforce class material and to observe actual, on-the ground practices. Student satisfaction with the course delivery and content, to date, is represented by student evaluations of 4.7 out of 5.0 which is very high relative to most other courses. In 2005 and 2006, the course will be repeated in May as an intensive 3-week course, and in the fall as a regular semester course. A new wildflower experiment will be installed on the University of Florida agroforestry demonstration site in late 2004, and an explanatory kiosk and signs will be installed in late 2004 or early 2005. As a preliminary assessment, several of the students completing the course have indicated they will go on to graduate school in environmental science or management.

Department of Fisheries and Wildlife Sciences and the Department of Wood Science and Forest Products at the Virginia Polytechnic Institute and State University - Researchers within the Department of Fisheries and Wildlife Sciences and the Department of Wood Science and Forest Products at the Virginia Polytechnic Institute and State University will undertake a 3-year initiative to improve critical thinking and problem-solving skills in undergraduate students. Specifically, at the end of the 3-year funding period, investigators intend that a minimum of 25 natural resources-focused case studies be developed, tested, modified, and re-evaluated under actual classroom conditions. Case studies will be developed specifically within the fisheries management, wetland management, non-timber forest products, and role of science in management subject areas; an evaluation protocol, with associated performance measure indicators, suitable for use in post-secondary education to assess a student's critical thinking/problem solving capacity; selected classroom assessment techniques (CATs) suitable for use to monitor the progress of case study implementation; training sessions or one-day workshops in case study methods and case development for faculty interested in learning more about this pedagogical approach; and journal articles tailored to education and natural resource professionals. The use of case studies will not replace entirely other teaching approaches used in these classes; rather, the heavy reliance on case study and collaborative learning approaches will supplement and enhance traditional pedagogical methods. In addition to improving the educational quality of these courses and enhancing the life-long learning skills of students enrolled in them, investigators intend to make the educational resources and evaluation methods developed from this project available to instructors in natural resources programs at other institutions. Finally, the co-investigators will conduct instructional seminars or training workshops for interested faculty, both from within and outside the home departments, on: case study teaching, development and evaluation of case study modules, and assessing overall improvement of student skill building. Although still too early to cite observed impacts, preliminary results of research on effective pedagogy to improve reasoning and critical thinking skills in higher education students, suggests noticeable improvement through reliance on case study approaches.

University of Florida, School of Forest Resources and Conservation, Auburn University, School of Forestry and Wildlife Sciences, and Mississippi State University, Department of Forestry University of Florida, School of Forest Resources and Conservation, Auburn University, School of Forestry and Wildlife Sciences, and Mississippi State University, Department of Forestry, are developing lecture and lab materials for a restoration ecology course to be offered simultaneously at the three institutions. The project will result in: (a) a set of high quality VHS videotapes that contain all the lecture materials, (b) a CD-ROM virtual tour of prominent longleaf pine restoration sites in the Southeast, (c) a 4-day field tour to introduce students to prominent restoration sites across the southeast, (d) a Restoration Ecology of Longleaf Pine Ecosystems web site, and (e) a much needed textbook / handbook on restoration ecology of longleaf pine ecosystems. Further, course related performance goals expected of students include: (1) an in-depth analysis and synthesis of the ecological and economic importance of longleaf pine ecosystems, (2) theoretical and technical knowledge from ecology, soils and other bio-physical sciences to form the intellectual foundation of ecological restoration, (3) knowledge of variables that led to longleaf pine replacement and barriers to restoration, (4) techniques used in ecological restoration, and evaluation and monitoring, and (5) socio-economic, policy and political dimensions of ecological restoration.

The major product of this project has been workforce-ready graduates who help the efforts of natural resource agencies in restoring the damaged longleaf pine ecosystems and similar

ecosystems elsewhere in the country. For some students this course served as a stepping-stone to graduate programs in restoration ecology.

Management and Control of Forest and Range Fires -

Ensuring an adequate workforce of scientists and natural resource professionals is the goal of CSREES education programs. These programs enhance teaching excellence and academic programs and support undergraduate and graduate students in their education and research pursuits. Emerging knowledge needs to address the complexities of managing, using and reacting to fire through the interdisciplinary and visionary education programs at the nation's forestry and natural resources programs at colleges and universities.

Educational information and materials distributed to target audiences.

Distributed 31,700 Arizona Firewise extension publications in 2002 through County Extension Offices, local businesses, community and county fairs, local fire departments, and city offices.

Aquatic and Terrestrial Wildlife - About two-thirds of Wisconsin's land is privately owned, and much of the state's wildlife depends on private land for habitat. Millions of acres of forested tracts across the state are maturing and their value to different types of wildlife communities is changing. Landowners need to understand these ecological relationships to make informed decisions on managing their properties for the wildlife communities they value. To help landowners make land management decisions, University of Wisconsin wildlife specialists offer an educational program for landowners who want to practice forest stewardship, and share their knowledge with neighbors and friends. Over a five-year period, 125 landowners who control more than 100,000 acres were trained in forest stewardship. Follow-up surveys indicate that they impact five times that acreage as ambassadors for the project.

The Oregon State University Department of Fisheries and Wildlife is giving students a big-picture view of coastal marine environment management issues via a special intensive 2-week Coastal Ecology and Resource Management course. The class, and associated short courses, provides students with a diverse array of hands-on educational experiences aimed at "total immersion" learning of the ecology and management of coastal marine and freshwater ecosystems and natural resources

Acronym Definitions

Acronym	Definition
A&M	Agricultural and Mechanical
AAEG	American Association for Agricultural Education
AAHHE	American Association of Hispanics in Higher Education
AASCARR	American Association of State Colleges of Agriculture and Renewable Resources
AAVMC	Association of American Veterinary Medical Colleges
ABP	Alliances for Broadening Participation
AC	Ancestors Choice
ACOP	Academic Programs Committee on Organization and Policy
ADAP	Agricultural Development in the American Pacific
AETI	Agribusiness Education, Training and Incubator
AFE	Agriculture, Food and Environment
AGEP	Alliances for Graduate Education and the Professoriate
AI	Artificial Insemination
AIGP	American Indian Graduate Program
AITC	Agriculture in the Classroom
ALANA	African, Latino, Asian, and Native American
ANNH	Alaska Native- and Native Hawaiian-Serving Institutions Education Grants Program
ANRM	Agriculture and Natural Resource Management
APHIS	Animal and Plant Health Inspection Service
ARCH	Alliance for Rural Community Health
AREERA	Agricultural Research, Extension and Education Reform Act
ARS	Agricultural Research Service
AS	Associate in Science
AS	American Samoa
BD	Bridge to the Doctorate
BS	Bachelor of Science
CAP	Coordinated Agricultural Project
CAR	Crops at Risk
CariPAC	Caribbean and Pacific Consortium
CAT	Classroom Assessment Techniques
CBG	1890 Capacity Building Grants Program (includes Teaching and Research)
CDKC	Chief Dull Knife College

Acronym	Definition
CES	Cooperative Extension Services
CFP	Certified Financial Planners
CIP	Classification of Instructional Programs
CLT	Conservation Leaders of Tomorrow
CMN	College of the Menominee Nation
CP	Competitive Programs
CPR	cardiopulmonary resuscitation
C-REEMS	Cooperative Research, Education, and Extension Management System
CRIS	Current Research Information System
CSREES	Cooperative State Research, Education, and Extension Service
CTAHR	College of Tropical Agriculture and Human Resources
CYFAR	Children, Youth and Families At-Risk
DASH	Dietary Approaches to Stop Hypertension
Ded	Department of Education
DNA	Deoxyribonucleic acid
DNA	Deoxyribonucleic acid
DOE	Department of Energy
DSU	Delaware State University
DVM	Doctor of Veterinary Medicine
EAT	Education and Agriculture Together
ECOP	Extension Committee on Organization and Policy
ECS	Economic and Community Systems
EFNEP	Expanded Food and Nutrition Education Program
ENOR	Eagle's Nest/Owl's Roost Environmental Discovery Program
EPA	Environmental Protection Agency
ERS	Economic Research Service
ESCOP	Experiment Station Committee on Organization and Policy
ETS	Educational Training Support
FACT	Food, Agriculture, Conservation, and Trade
FAEIS	Food and Agricultural Education Information System
FAS	Foreign Agricultural Service
FAST	Faculty and Student Team
FBC	Fort Belknap College

Acronym	Definition
FBCC	Fort Berthold Community College
FBI	Federal Bureau of Investigation
FDLTCC	Fond Du Lac Tribal and Community College
FFA	Future Farmers of America
FFP	Family Financial Planning
FIPSE	Fund for the Improvement of Postsecondary Education
FPCC	Fort Peck Community College
FRTEP	Federally-Recognized Tribes Extension Program
FS	Forest Service
FSA	Farm Service Agency
FSIS	Food Safety and Inspection Service
FY	fiscal year
GASP	Global Agricultural Studies Programs
GIS	Geographic Information Systems
GPA	grade point average
GPS	Global Positioning Systems
GS	General Schedule
HBCU	Historically Black Colleges and Universities
HCC	Honolulu Community College
HEC	Higher Education Challenge Grants Program
HEP	Higher Education Programs
HLRM	High Latitude Range Management
HS	high school
HSI	Hispanic-Serving Institutions Education Grants Program
IC	Ilisagvik College
ICEWEB	Indian Country Extension Website
ICOP	International Committee on Organization and Policy
IDEA	Interactive Distance Education Alliance
IGERT	Integrative Graduate Education and Research Traineeship
IP	International Programs

Acronym	Definition
IPA	Intergovernmental Personnel Act
IPM	Integrated Pest Management
IRTA	International Study or Thesis/Dissertation Research Travel Allowances
ISE	International Science and Education Competitive Grants Program
IT	information technology
JDIP	Johne's Disease Integrated Program
K	Kindergarten
KA	Knowledge Area
KSU	Kentucky State University
KSU	Kansas State University
LEAP	Louisiana Educational Achievement Program
LSAMP	Louis Stokes Alliances for Minority Participation
M	million
MA	Multicultural Alliances
MANRRS	Minorities in Agriculture, Natural Resources and Related Sciences
MAS	Marker Assisted Selection
MASP	Multicultural Agricultural Scholars Program
MBA	Master of Business Administration
MBT	Methyl Bromide Transitions
MPH	Master of Public Health
MS	master of science
MSDP	Multicultural Scholars into Dietetics Program
MSP	Higher Education Multicultural Scholars Program
MSU	Montana State University
NACTA	North American Colleges and Teachers of Agriculture
NAEP	National Assessment of Education Progress
NARCH	Native American Research Center for Health
NAREEEAB	National Agricultural Research, Extension, Education, and Economics Advisory Board
NARETPA	National Agricultural Research, Extension and Teaching Policy Act
NASA	National Aeronautics and Space Administration
NASULGC	National Association of State Universities and Land-Grant Colleges
NCAE	National Council for Agricultural Education
NCATU	North Carolina Agriculture and Technical University

Acronym	Definition
NCES	National Center for Education Statistics
NDSU	North Dakota State University
NIFA	National Institute of Food and Agriculture
NIFSI	National Integrated Food Safety Initiative
NIH	National Institutes of Health
NIWQ	National Integrated Water Quality
NNF	Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowship Grants Program
NOAA	National Oceanic and Atmospheric Administration
NPL	National Program Leader
NRCS	Natural Resources Conservation Service
NRD	National Resource Directory
NRE	Natural Resources and Environment
NRI	National Research Initiative
NSF	National Science Foundation
NWIC	Northwest Indian College
NYFEA	National Young Farmer Educational Association
OKSU	Oklahoma State University
OMB	Office of Management and Budget
OSU	Ohio State University
PALS	Partners in Active Learning Support
PAS	Plant and Animal Systems
PAS	Postsecondary Agricultural Student
PD	Project Director
Ph.D.	Doctor of Philosophy
PMAP	Pest Management Alternative Program
PR	Puerto Rico
R & E	Research and Education
RAMP	Risk Avoidance and Mitigation Program
RES-Q	Responsible Environmental Stewardship - Quest
RFA	Request for Application

Acronym	Definition
RIIA	Resident Instruction Grants for Institutions of Higher Education in Insular Areas
RNA	Ribonucleic acid
RRDC	The Regional Rural Development Center
RREA	Renewable Resources Extension Act
RSENR	Rubenstein School of Environment & Natural Resources
SAEP	Supervised Agricultural Experience Program
SAES	State Agricultural Experiment Stations
SARE	Sustainable Agriculture Research and Education
SBAE	School Based Agricultural Education
SCSU	South Carolina State University
SED	Survey of Earned Doctorates
SERD	Science and Education Resources Development
SET	Science, Engineering and Technology
SPC	Secretariat of the Pacific College
SPEC	Secondary and Two-Year Postsecondary Agriculture Education Challenge Grants Program
SRDC	Southern Rural Development Center
SRI	Social Responsibility Initiative
SSR	simple sequence repeat
STEM	Science, Technology, Engineering and Mathematics
TAP	Teaching Awards Program
TC	Tribal College
TCEG	Tribal Colleges Education Equity Grants Program
TCRGP	Tribal Colleges Research Grants Program
TEAM	Tropical Forest Ecosystem and Agroforestry Management
TESA	Targeted Expertise Shortage Areas
TMCC	Turtle Mountain Community College
UAF	University of Alaska Fairbanks

Acronym	Definition
UAS	University of Alaska Southeast-Ketchikan
UFS	University of the Free State
UH	University of Hawaii
UMES	University of Maryland Eastern Shore
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USP/IRETA	University of South Pacifics Institute for Research, Extension and Training in Agriculture
UVM	University of Vermont
UW	University of Wisconsin
VI	Virgin Islands
WVU	West Virginia University
ZLM	Zortman-Landusky Mine