



# COOPERATIVE STATE RESEARCH, EDUCATION, AND EXTENSION SERVICE

## Strategic Plan for FY 2004-2009



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## MESSAGE FROM THE ADMINISTRATOR

The future of our nation lies in the education of our people, the preservation of our natural resources, and the stimulation of economic growth and development. The Cooperative State Research, Education, and Extension Service (CSREES) helps American agriculture meet the nation's primary challenges – sponsoring research and education programs to protect our food and fiber supply from the farm to the consumer, and finding environmentally and economically sustainable ways to develop the most successful agricultural production system possible. CSREES has primary responsibility for providing linkages between federal and state components of a broad-based, national agricultural research higher education, and extension system, utilizing the partner resources of the U.S. Department of Agriculture with land-grant and other colleges and universities, and public and private laboratories.

Strategic planning is critical to CSREES to ensure fair, effective, and efficient administration of federal assistance, implementing research, education, and extension awards and agreements. This Strategic Plan identifies key policy and management objectives that will be integrated within CSREES budget priorities and that will provide accountability through a series of annual performance plans. Central to the plan is effective management of the agency's limited resources to best address USDA education and research needs. As noted in the USDA Strategic Plan, research (which provides the foundation for modern agriculture) is a key to success in meeting the Department's goals. Education builds scientific and agricultural literacy and recruits, retains, and graduates the best and brightest of a diverse population to ensure the quality of future research. Extension assures the timely transfer of scientifically valid knowledge and information to producers, managers, and other citizens.

This Strategic Plan is a living document that will evolve in response to changes in national needs. We appreciate the interest and support of CSREES staff and partners who contributed to this plan, and we look forward to continued dialogue to further strengthen research, education, and extension related to agriculture, communities, and the environment.

Colien Hefferan  
Administrator, CSREES

## **INTRODUCTION**

### **CSREES VISION**

Agriculture is a knowledge-based, global enterprise, sustained by the innovation of scientists and educators.

### **CSREES MISSION**

To advance knowledge for agriculture, the environment, human health and well-being, and communities.

### **CSREES FUNCTIONS**

- Program leadership to identify, develop, and manage programs to sponsor university-based and other institutional education, research, and extension.
- Fair, effective, and efficient administration of federal assistance implementing education, research, and extension awards and agreements.

The Cooperative State Research, Education, and Extension Service (CSREES) has primary responsibility for providing linkages between federal and state components of a broad-based national agricultural research higher education, research, and extension system designed to address national problems and needs identified by the Secretary of Agriculture in the USDA Strategic Plan and by the Congress in its legislation. CSREES manages this system by providing national leadership in setting research, education, and extension priorities, and obtaining feedback from the states on local and regional priorities. CSREES influences research higher education, research, and extension by representing the Secretary in administering formula and competitive grant funds appropriated by Congress. CSREES helps ensure that a high-quality higher education infrastructure will be available to address national needs, and uses that infrastructure of scientific expertise at colleges, universities, and public and private laboratories to partner in addressing national priorities. The primary partners are institutions of higher learning, particularly the land grant institutions - 1862, 1890 (historically Black colleges and universities), and 1994 (Tribal land-grant colleges and universities), and the non-land-grant public institutions. High rates of return on the public investment in agriculturally related research and extension are well documented. Public investment in higher education in the food and agricultural sciences has been similarly successful, especially for underserved populations and minority-serving institutions.

### **BACKGROUND**

When the U.S. Congress established the U.S. Department of Agriculture and the land-grant university system in 1862, the scientific basis of agriculture was rudimentary and focused primarily on increasing the productivity of land and animals. Plant and animal breeding, nutrient management, pest control, and mechanization are significant milestones in the spectrum of scientific investment in agricultural productivity. As agriculture matured and became more fully integrated into the social, political, and economic structure of the nation, broader issues, including positive and negative environmental and economic externalities, public investment in

agriculture and rural communities, and the sustainability of the scientific workforce emerged. Breakthroughs in fundamental science, including genomics, microbiology, and nanotechnology are providing new opportunities for applying science, technology, and advanced practices in the production, marketing, and distribution of food and fiber products. These sometimes generate additional questions regarding long-term risks and benefits, ethics, and domestic and international consumer acceptance. Current national security needs raise important issues regarding the aggregate safety and security of the food and fiber supply. Blocking terrorism aimed at food and fiber products and protecting public health and well-being require a coordinated effort to apply cutting-edge food and agricultural science in diverse areas, ranging from emergency preparedness to epidemiology.

The increasingly global nature of contemporary agricultural products offers the world the benefit of a more varied food supply, but it is accompanied by increased risks of food borne disease and invasive pests. The information available from the sciences of plant and animal genomics, remote sensing, disease epidemiology, animal and human nutrition, and market and policy analysis has transformed agriculture into a high-tech, environmentally sustainable, and profitable industry that can address the world's accelerating food and fiber needs. Expanding our scientific base beyond the production sciences to also address human health, environmental sustainability, and community and economic development is crucial to sustaining the availability of food and fiber in growing international markets.

Healthy diets and active lifestyles are needed to promote human health, to maintain a healthy body weight, and to reduce the risk of chronic disease related to food consumption. State-of-the-art scientific techniques document optimal nutritional needs from gestation through old age. Technological advancements, such as sequencing of the human and other genomes, may someday allow scientists to develop individual nutrient requirements as determined by age, environment, gender, genetics, lifestyle, and physiology. Research that provides greater understanding of the determinants of food choices and variations in energy metabolism will allow educators to design more effective nutrition education strategies.

The ultimate customers of CSREES are citizens – CSREES works with land-grant and other institutions and industries to create, apply, and transfer knowledge and technology from the laboratory to farmers, consumers, policymakers, and agribusiness. CSREES-sponsored extension provides information to nearly every one of the 3,150 counties in the nation, offering education that links research, science, and technology to people where they live and work.

## **STRATEGIC PLAN FRAMEWORK**

The five strategic goals and their accompanying objectives contained in this plan describe major programmatic policies of CSREES that support the same five goals in the USDA Strategic Plan, and do so in a manner set out in the REE Mission Area Strategic Plan. Actionable strategies delineate the activities planned to reach the strategic goals. This plan also describes management plans that detail improvements in human capital, competitive sourcing, e-Government, budget and performance integration, and portfolio management.

### **PERFORMANCE MEASURE**

The primary performance measure is the portfolio review score for each portfolio of research, education, extension, and integrated activities that supports an objective. Portfolios of projects are subject to rigorous assessment by experts on an annual and periodic (5-year) basis to determine the extent to which each portfolio is making progress toward solving national problems. An assessment tool is used to review each portfolio's relevance, quality, and performance, assigning a quantitative score to its management performance. Using recommendations from expert reviewers, national program leaders work to improve portfolio performance. Performance criteria may change over time for established programs as issues emerge and priorities fluctuate. CSREES also supports overall USDA measures for departmental efforts.

### **KEY EXTERNAL FACTORS**

There are many external facilitating and hindering factors outside the control of any federal agency that may affect progress toward performance goals. It is important to note these factors for planning purposes to mitigate or leverage their influence, as well as for evaluation purposes, so that proper causal conclusions can be made regarding the true effectiveness of programs and proper remedial steps can be implemented to improve programmatic efforts. Such external factors must be considered in robust evaluation study designs and in expert panel reviews to provide accurate feedback and recommendations for management improvements to policy makers and program leaders.

Key external factors that may influence CSREES programs include:

- weather and other growing conditions at home and abroad;
- costs to implement advances (knowledge, techniques, inventions, etc.);
- domestic and international economic factors, including consumer purchasing power, the strength of the U.S. dollar and competing currencies, and price volatility;
- national and foreign policy and political changes;
- increasing world population and attendant increases in demand for agricultural products;
- the accidental or intentional introduction of foreign diseases and hazardous agents, and emerging and re-emerging pests and diseases, affecting plants, animals, and humans;
- food choices made available and advertised to consumers by producers;

- agricultural lands that are commingled with urban, suburban, and non-agricultural lands as part of complex watersheds and ecosystems, and the attendant activities taking place beyond CSREES influence;
- access to timely and accurate information;
- acceptance of advances (knowledge, techniques, inventions, etc.) in agricultural science by farmers, producers, and the general population;
- coordination and cooperation of other federal agencies with CSREES;
- coordination and cooperation of state partners with CSREES;
- existence of local collaboration;
- level of funding available for agricultural partnering efforts at the federal, state, and local level; and
- willingness of private sector funders, such as corporations, foundations, and community organizations, to partner with CSREES, adopt new advances, etc.

## **STRATEGIC GOAL 1: ENHANCE ECONOMIC OPPORTUNITIES FOR AGRICULTURAL PRODUCERS**

Sustaining and expanding new markets for U.S. agricultural products is critical for the long-term economic health and prosperity of the food and agricultural sector. American farmers and ranchers have superior natural resources, cutting-edge technology, a high level of education and management skill, and a supporting infrastructure that result in production capacity that exceeds domestic needs. U.S. agricultural productivity expands global markets and results in a consistently positive balance of agricultural trade. Our production capability is the basis for new uses for agricultural and forestry resources in industrial and pharmaceutical markets, and results in our having the world's lowest percentage of disposable income spent for food. CSREES provides the research, education, and extension base on which contemporary agriculture depends for future growth and development.

### **OBJECTIVE 1.1: PROVIDE INFORMATION, KNOWLEDGE, AND EDUCATION TO HELP EXPAND MARKETS AND REDUCE TRADE BARRIERS**

The economic viability of U.S. agriculture depends on its performance in the global market. To enhance the competitiveness of U.S. agricultural commodities, products, and processes in the global economy, the production, processing, and distribution system must provide reliable supplies of desired products to buyers at competitive prices. Timely, reliable, and valid research, along with education and extension leading to adoption of new technologies and their resulting economic advantage, helps the U.S. maintain its net positive agricultural balance of trade by expanding international markets.

CSREES provides and distributes knowledge and technologies to sustain agricultural productivity, and data, analysis, and management capabilities to operate the system efficiently and effectively. CSREES sponsors the development, teaching, and dissemination of science-based information to promote market efficiency, overcome barriers to trade that arise from scientific and technical problems, enhance sales of food and agricultural products to buyers worldwide, and adjust quickly to emerging trade opportunities and challenges.

### **PERFORMANCE CRITERIA**

- 1.1.1 Foster understanding of markets, productivity, agricultural competitiveness, and inter-regional trade and provide insight on the role and function of markets and their regulation (CSREES Problem Area 603).
- 1.1.2 Increase knowledge and understanding of the distribution of products, goods, and services, the practices of buying and selling, and the development and improvement of markets (CSREES Problem Area 604).
- 1.1.3 Increase understanding of economic and social impacts of domestic programs and policies, including the effect of government actions on the U.S. (CSREES Problem Area 610).

## **ACTIONABLE STRATEGIES**

- Sponsor economic analyses of how agriculture-related trade restrictions from technical barriers affect the U.S. agricultural sector.
- Sponsor research and economic and statistical analyses to enhance the understanding of foreign markets and international trade barriers and the impacts of trade agreements, political and economic structural changes, and technology developments on the competitive position of U.S. agriculture.
- Sponsor international research activities to supplement technology development and strengthen the competitive position of U.S. agriculture.
- Deliver science-based information, education and training, and continuing professional development to U.S. agribusinesses seeking to compete in the global marketplace.
- Sponsor outreach, education, and extension to help producers, processors, and distributors adapt to changing foreign and domestic market structures and consumer preferences.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **OBJECTIVE 1.2: SUPPORT INTERNATIONAL ECONOMIC DEVELOPMENT AND TRADE CAPACITY BUILDING**

Developing and transitioning countries are a major source of new demand for agricultural products. Access to these markets is important to U.S. producers. These countries represent the largest population growth and market potential for U.S. agricultural exports, but their purchasing power is limited as their economies and markets struggle. Limited technology and weak or obsolete infrastructure hinder developing and transitioning countries' capacity to participate effectively in global markets. Trade increases economic growth opportunities by expanding markets and promoting economic development. Education and technology transfer help expand international trade in food and agriculture.

CSREES funds the production and dissemination of science-based information, education, and technical assistance that lead to capacity building in developing countries, promoting economic, political, and social stability. Research discovers more productive and environmentally benign ways to produce food and fiber, not only in the U.S. but also worldwide.

## **PERFORMANCE CRITERIA**

- 1.2.1 Increase knowledge and understanding of economic components of international trade and development, trade performance of sectors of the U.S. economy, and that of other countries development impacts (CSREES Problem Area 606).
- 1.2.2 Increase understanding of U.S foreign policy goals and policies that have been implemented (CSREES Problem Area 611).

## **ACTIONABLE STRATEGIES**

- Sponsor research, education, and extension to aid developing and transitioning countries develop and enhance agricultural sector performance, formulate agricultural policies, and implement agricultural programs.
- Support the sharing of agricultural knowledge with producers and rural community leaders around the world to expand the productivity and nutritional impact of global agriculture.
- Support international research and education collaboration to address problems of mutual concern such as food safety, pest management, disease control, and the environment.
- Provide technical assistance to help developing countries create and maintain credible systems to collect, analyze, and report statistics to monitor agricultural sector performance, formulate agricultural policies, and implement agricultural programs.
- Sponsor research, training, and technical assistance to developing countries to build trade and economic capacity, including the ability to safely use agricultural biotechnology.
- Identify and support the types of international assistance and domestic support policies that can ensure that the poor in developing countries participate in the benefits of trade liberalization.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **OBJECTIVE 1.3: PROVIDE SCIENCE-BASED KNOWLEDGE AND TECHNOLOGIES TO GENERATE NEW OR IMPROVED HIGH-QUALITY PRODUCTS AND PROCESSES TO EXPAND MARKETS FOR THE AGRICULTURAL SECTOR**

New products, new uses, and value-added processes must be acceptable to consumers to be commercially successful. Biobased technologies promise opportunities for energy, industrial, pharmacological, and other non-food markets for U.S. producers. New markets are emerging for environmental activities and products that mitigate environmental threats. The foundation for economic, technological, and market advancement is timely, valid, and reliable research, education, and extension that lead to inventions and practices that help establish new products in the marketplace.

CSREES sponsors vital research and development contributions for new products, quality improvements, new uses, and value-added processes that enhance market opportunities for agricultural and forest products. Through education and extension, CSREES and its partners effectively demonstrate and transfer this knowledge to users.

## **PERFORMANCE CRITERIA**

- 1.3.1 Develop new and improved food products and processing technologies (CSREES Problem Area 501).
- 1.3.2 Develop new and improved food products (CSREES Problem Area 502).
- 1.3.3. Improve quality maintenance in storing and marketing food products (CSREES Problem Area 503).

- 1.3.4 Improve home and commercial food service (CSREES Problem Area 504).
- 1.3.5 Develop new and improved non-food products and processing technologies (CSREES Problem Area 511).
- 1.3.6 Improve quality maintenance in storing and marketing non-food products (CSREES Problem Area 512).

### **ACTIONABLE STRATEGIES**

- Sponsor work to improve understanding of the economic and social factors that impact food marketing.
- Sponsor research, education, and extension to protect germplasm biodiversity, define the nature of genetic resources, and develop and transfer consumer-acceptable genetically modified crops economically.
- Sponsor development of new and improved technologies to convert agricultural products into value-added biobased products.
- Sponsor assessment of quality trends and demand for food and biobased products in global markets.
- Sponsor research, education, and extension to improve intrinsic product quality and consistency.
- Sponsor research and extension on grading, sorting, packaging, and storage technologies for food products that maintain nutrition and increase shelf life.
- Sponsor research to identify attributes that define the quality of biobased products and co-products and explain the relationships among chemical composition, molecular and physical structure, and end-use quality and function.
- Sponsor development of food products with improved nutritional, functional, and pharmaceutical characteristics.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

### **OBJECTIVE 1.4: PROVIDE SCIENCE-BASED INFORMATION, KNOWLEDGE, AND EDUCATION TO FACILITATE RISK MANAGEMENT BY FARMERS AND RANCHERS**

The U.S. agricultural sector must be dynamic to quickly respond to changing political, economic, technological, environmental, and consumer-driven market forces. Agricultural production and marketing are constantly affected by external factors such as weather and growing conditions, diseases and pests, financial conditions, cultural practices, and consumer demand. New and emerging risks associated with domestic and international policy, genetic technology, exotic invasive species, and complex agricultural diseases that can affect humans defy conventional means of identification, quantification, and management.

CSREES contributes to the improvement and strengthening of this dynamic agricultural system through sponsoring research into alternative methods to identify, assess, and manage risk, providing relevant education, and extending information and practices to improve production and market decisionmaking through enhanced risk management.

## **PERFORMANCE CRITERIA**

- 1.4.1 Improve the design, construction, and cost effectiveness of facilities for animals, agricultural products, agricultural inputs, equipment, and other materials (CSREES Problem Area 401).
- 1.4.2 Improve mechanization, including nanotechnology, to increase efficiency and decrease labor requirements in agricultural and forestry production (CSREES Problem Area 402).
- 1.4.3 Develop and improve instrumentation and information systems and sensors for improved control of the production and processing of biological materials and biohazards (CSREES Problem Area 404).
- 1.4.4 Improve the economic choices farmers and ranchers make to access and allocate resources for the production of commodities, services, and products (CSREES Problem Area 601).
- 1.4.5 Develop and improve management and administrative techniques applied to farming, agricultural businesses and other businesses and enterprises to enhance planning, decisionmaking and resource use (CSREES Problem Area 602).

## **ACTIONABLE STRATEGIES**

- Sponsor research, education, and extension on the adequacy and efficacy of risk assessment, management, and abatement tools and techniques.
- Integrate new science-based knowledge and technologies to optimize efficient, economically and environmentally sustainable agricultural production systems that are appropriate in size and scale.
- Sponsor research analyses of the benefits and costs of agricultural and environmental policies to understand the effects of alternative production management systems on environmental quality and agricultural competitiveness and profitability.
- Sponsor development and dispersal of research-based knowledge and understanding of biologically based technologies to improve the efficiency of production, safety, nutrient content, and quality of plants, animals, microbial organisms, and their products.
- Provide outreach, education, and extension to help producers, processors, and distributors adapt to changing foreign and domestic market structures and consumer preferences.
- Provide timely and accurate agricultural statistics to be used by producers to make informed production, marketing, and risk-management decisions.
- Sponsor academic and public outreach programs to deliver science-based information, education, training, and continuing professional development to agricultural producers on risk management.
- Sponsor development of knowledge to inform public and private decisionmakers on strategies for reducing risk in managing natural resources.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **OBJECTIVE 1.5: CONTRIBUTE SCIENCE-BASED INFORMATION, ANALYSIS, AND EDUCATION TO PROMOTE THE EFFICIENCY OF AGRICULTURAL PRODUCTION SYSTEMS**

Fundamental to the stability and adequacy of our nation's food and fiber supply is the ability of a farmer or rancher to manage an efficient operation that realizes a profit. While factors such as market conditions, weather, and diseases play an important role, production and market efficiency are critical components of economic viability. Government programs help manage some of the risk that producers inevitably face. Program eligibility and participation parameters must be understood and properly managed to optimize the protections that these programs offer. The long-range goal of research, education, and extension is to help producers operate efficient, economically sustainable farms and ranches yielding high-quality products that are profitable at market prices, minimizing the need to use any safety net. CSREES uses the best science, education, and extension to design new management procedures and improve existing ones.

CSREES funds higher education, research, and extension programs to develop and transfer technology, practices, and skills to support economically viable farms and ranches of varying size and scale. This work reduces production costs, increases production efficiency, improves yields, reduces environmental impacts, improves marketing and management decisions, develops new products and uses for byproducts, and finds new ways of adding value to traditional crops and products. Research ranges from using genomics to develop hybrids requiring fewer chemical inputs, to systems for more informed decisionmaking, to new precision technology and nanotechnology to improve management of crops and animals.

#### **PERFORMANCE CRITERIA**

- 1.5.1 Develop fundamental information and improve understanding of plant genetics and plant breeding technology (CSREES Problem Area 201).
- 1.5.2 Identify, preserve, and characterize genetic resources for plant production or protection (CSREES Problem Area 202).
- 1.5.3 Understand and improve plant productivity and quality as affected by reduced inputs, or stresses (CSREES Problem Area 203).
- 1.5.4 Improve biological quality before harvest (CSREES Problem Area 204).
- 1.5.5 Develop and implement comprehensive plant production management systems (CSREES Problem Area 205).
- 1.5.6 Improve understanding of fundamental processes and mechanisms basic to plant life (CSREES Problem Area 206).
- 1.5.7 Increase and improve the reproductive performance of animals (CSREES Problem Area 301).
- 1.5.8 Enhance the efficiency of nutrient utilization for animal productivity (CSREES Problem Area 302).
- 1.5.9 Develop and apply information and technology for genetic improvement of animals (CSREES Problem Area 303).
- 1.5.10 Map and understand the genome of agriculturally important animal species (CSREES Problem Area 304).
- 1.5.11 Improve understanding of fundamental animal physiological processes (CSREES Problem Area 305).
- 1.5.12 Mitigate or reduce animal environmental stress (CSREES Problem Area 306).

- 1.5.13 Develop and implement comprehensive animal production management systems (CSREES Problem Area 307).
- 1.5.14 Increase knowledge of composition of animal products, quality factors, and consumer preferences (CSREES Problem Area 308).

### **ACTIONABLE STRATEGIES**

- Support the development and provision of accurate, timely information for producers and policymakers to make informed production, management, and marketing decisions to increase the profitability and competitiveness of agriculture.
- Sponsor science-based work to increase producers' knowledge and understanding of biologically and information-based technologies to improve production efficiency, safety, and nutrient content and quality of plants, animals, and their products.
- Sponsor research to improve animal nutrition by examining the chemical composition and availability of nutrients in feedstuffs, nutritional requirements of grazing and non-grazing animals, and efficient use of nutrients to minimize non-productive nutrient losses.
- Sponsor efforts to conserve, characterize, and make available genetic resources for research and development.
- Support the integration of new science-based knowledge and technologies to optimize efficient, economically and environmentally sustainable agricultural production systems that are appropriate in size and scale.
- Sponsor analyses of the benefits and costs of agricultural and environmental policies to compare the effects of alternative production and management systems.
- Sponsor research, education, and extension to better understand and address consumer needs, tastes, and preferences.
- Sponsor research and extension to identify, map, and understand the function and control of genes that will permit development of new technologies and realization of the full potential of economically significant plants and food animals.
- Support the knowledge base that informs policymakers seeking solutions to increase the profitability and competitiveness of American agriculture.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **STRATEGIC GOAL 2: SUPPORT INCREASED ECONOMIC OPPORTUNITIES AND IMPROVED QUALITY OF LIFE IN RURAL AMERICA**

The economic opportunities and quality of life enjoyed by residents and businesses in communities depend significantly on their capacity to take full advantage of the resources available to them, and to adjust to changing circumstances. The well-being and needs of communities and their residents vary widely. Minorities are especially likely to be disadvantaged due to poverty, lack of access to education and health care, and limited opportunity for high-wage employment. Disparities are found among communities across America in income, savings, education, housing, and other quality-of-life measures. CSREES promotes the well-being of America through research, analysis, and education to better understand the economic, demographic, and environmental forces affecting regions and communities, and using knowledge to develop strategies that make maximum use of local assets. Through higher education, research, and extension, CSREES supports the education and training of residents and community and business leaders to help their communities thrive in the global economy.

### **OBJECTIVE 2.1: EXPAND ECONOMIC OPPORTUNITIES IN RURAL AMERICA BY BRINGING SCIENTIFIC INSIGHTS INTO ECONOMIC AND BUSINESS DECISION MAKING**

A sustainable local economy is a major factor in creating stronger communities and fostering a desirable social and economic environment for individuals, families, firms, and the community as a whole. A strong economy gives residents access to meaningful, financially rewarding employment, and it is the foundation of the tax base that supports vital public services such as education, law enforcement, fire protection, health care, and recreation. Understanding the dynamics of the economy and the policies and programs that promote economic activity is critical to success.

CSREES supports the generation, dissemination, and use of research-based information and knowledge to support new and innovative economic opportunities for communities and to assist public and private sector leaders in their decisionmaking on rural issues.

#### **PERFORMANCE CRITERIA**

- 2.1.1 Improve management of physical resources and socioeconomic relationships for recreation (CSREES Problem Area 134).
- 2.1.2 Develop and improve management and administrative techniques applied to farming, agricultural businesses and other businesses and enterprises to enhance planning, decisionmaking, and resource use (CSREES Problem Area 602).
- 2.1.3 Increase knowledge, understanding, and decisionmaking capability regarding community needs, preferences, costs, and benefits (CSREES Problem Area 608).

- 2.1.4 Develop economic theory and methodology to help government, public and private entities, and individuals improve their knowledge base and decisionmaking capacity (CSREES Problem Area 609).
- 2.1.5 Improve the development, quality, and functioning of community institutions and social services (CSREES Problem Area 805).
- 2.1.6 Enhance and improve program and project design, experimental design, surveys, sampling, and statistical analysis (CSREES Problem Area 901).
- 2.1.7 Increase the efficiency and effectiveness of research, education, and extension methods, management, and proposals (CSREES Problem Area 902).
- 2.1.8 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 (CSREES Problem Area 903).

### **ACTIONABLE STRATEGIES**

- Sponsor analysis of policy and research into viable practices for business management and community leadership to optimize public and private decision-making.
- Sponsor research, education, and extension on economic diversification, e-commerce, entrepreneurship, community planning, service infrastructure, local government, workforce development, leadership development, and civic engagement.
- Sponsor research and analysis on the structure and performance of rural economies and on services and resources that promote economic development.
- Sponsor education to public and private decisionmakers that facilitates greater understanding of the policies and programs that promote economic opportunities and improve quality of life.
- In cooperation with the USDA Rural Development Mission Area, support technology transfer to individuals and businesses.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

### **OBJECTIVE 2.2: PROVIDE SCIENCE-BASED TECHNOLOGY, PRODUCTS, AND INFORMATION TO FACILITATE INFORMED DECISIONS AFFECTING THE QUALITY OF LIFE IN RURAL AREAS**

The well-being of communities depends on the social, environmental, and economic health of residents. An essential component of community well-being is the degree to which youth and adult residents can satisfy their basic needs, including food, clothing, housing, education, and health. Another is the capacity of residents, families, and businesses to effectively manage their money, time, and human capital.

CSREES sponsors research, education, and extension to improve the understanding of socioeconomic conditions in rural America, and to promote community, youth and family well-being.

## **PERFORMANCE CRITERIA**

- 2.2.1 Improve insight and understanding into the demands, preferences, behavioral responses, and needs of individuals and consumers (CSREES Problem Area 607).
- 2.2.2 Reduce hazards to the health, safety, and biosecurity of people involved in the production, processing, and distribution of agricultural and forest products (CSREES Problem Area 723).
- 2.2.3 Improve understanding of how individuals and families obtain and use resources of time, money, and human capital to achieve their standard of living and quality of life (CSREES Problem Area 801).
- 2.2.4 Increase understanding and development of the social, cognitive, emotional, and physical capacity of children, youth, and adults throughout the life cycle (CSREES Problem Area 802).
- 2.2.5 Increase understanding of the technological, demographic, and social changes occurring in society and ways in which individuals, families, and communities cope with sociological and technological change (CSREES Problem Area 803).
- 2.2.6 Increase knowledge and understanding about the agricultural products used in apparel and textiles, and on factors that affect consumer choice and the interface between producers, retailers, and consumers (CSREES Problem Area 804).

## **ACTIONABLE STRATEGIES**

- Sponsor research-based information on community assets and liabilities that affect youth, family, and community well-being.
- Sponsor research on policies and programs addressing circumstances that impact the well-being of individuals, family, and communities.
- Support application of geographic information systems and other information technologies for problem-solving and strategies for local community and socioeconomic development.
- Sponsor research, education, and extension to support effective family decisionmaking in managing their social and economic capital.
- Sponsor regional rural development training, research, and information access.
- Sponsor analysis and education on issues that impact the well-being of communities and families, characterize people and places in need of assistance, and enhance the effectiveness of related public policies and programs.
- Sponsor education and extension to help parents provide a safe, healthy, and nurturing atmosphere in which children and youth can grow and learn.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **STRATEGIC GOAL 3: ENHANCE PROTECTION AND SAFETY OF THE NATION'S AGRICULTURE AND FOOD SUPPLY**

To sustain a high-quality, affordable, and safe food supply the U.S. must protect the food chain at each crucial link from production through consumption. Crop and livestock production systems must be protected from economically significant pests, pathogens, diseases, and toxins, whether naturally occurring or introduced. Throughout production, processing, distribution, and preparation, the food supply must be sheltered from contamination by organisms that cause disease in humans. Through cooperation with its partners, CSREES sponsors the development and distribution of science-based information, technology, and practices to producers, manufacturers, the workforce, and regulatory agencies to help ensure the safety of agriculture and the food supply for domestic and global consumers.

### **OBJECTIVE 3.1: REDUCE THE INCIDENCE OF FOODBORNE ILLNESSES AND CONTAMINANTS THROUGH SCIENCE-BASED KNOWLEDGE AND EDUCATION**

Maintaining an affordable and safe food supply is essential to the nation. The ability to detect and prevent contamination by intentional or naturally occurring causes is a priority to ensuring food safety throughout the production, processing, and distribution systems. Collecting and disseminating accurate scientific knowledge will promote food safety, from production to consumption.

CSREES sponsors research, education, extension, and technology development to identify and assess organisms, pathogens, and toxins that cause human disease throughout the agricultural environment, in foods, and in the processing and distribution systems. CSREES supports the development and transfer of practices and intervention strategies that manage, reduce, or eliminate food safety risk throughout the food chain.

#### **PERFORMANCE CRITERIA**

- 3.1.1 Ensure that food products are free of harmful chemicals, including residues from agricultural and other sources (CSREES Problem Area 711).
- 3.1.2 Protect food from contamination by pathogenic microorganisms, parasites, and naturally occurring toxins (CSREES Problem Area 712).

#### **ACTIONABLE STRATEGIES**

- Sponsor evaluation of foodborne illness and chemical-use data to reduce preventable illness and identify threats to food safety affecting public health.
- Sponsor research to provide a science-based, cost-effective approach to food safety that is valuable to industry and policymakers, and is trusted by the public.

- Sponsor education and extension to provide the public with information addressing food safety, handling practices, microbiological testing, and innovative methods and technologies.
- Sponsor development of scientifically valid tests for regulatory agencies in food production and for processors to detect pathogens in food products.
- Sponsor microbial genomic research to provide the basis for detection, diagnosis, and mitigation of foodborne pathogens.
- Sponsor development of information on the ecology of human pathogens and understanding pathways to decontaminate food.
- Sponsor development of new tests that can be used by producers, processors, and regulatory agencies to rapidly detect crop and livestock pathogens.
- Sponsor new on-farm and processing systems and practices to reduce pathogen for use contamination.
- Work with federal food safety agency partners to evaluate foodborne illness data and develop accurate measures on the effectiveness of regulatory strategies to reduce preventable foodborne illness.
- In cooperation with the USDA Food Safety Mission Area, sponsor scientific information and risk assessment models that permit regulatory agencies to assess risk for production, processing, and distribution systems.
- Sponsor the development and dissemination of science-based information on chemical usage in food production and processing.
- Sponsor research and extension to provide the public with food safety and biosecurity information and education that address all aspects of food safety and risk mitigation.
- Sponsor intervention strategies that aid regulatory agencies in establishing regulations under Hazard Analysis and Critical Control Point (HACCP).
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

### **OBJECTIVE 3.2: DEVELOP AND DELIVER SCIENCE-BASED INFORMATION AND TECHNOLOGIES TO REDUCE THE NUMBER AND SEVERITY OF AGRICULTURAL PEST AND DISEASE OUTBREAKS**

Agricultural pests and diseases threaten the quality of agricultural products and the economic health of farm operations and the surrounding community. Through basic and applied research, host-pathogen interactions are identified, epidemiological and economic impacts of diseases and pests described, and control measures improved and validated. Through education and extension, producers and practitioners understand the threats from diseases and pests and can implement effective and efficient means of control.

CSREES sponsored research and analysis is a primary source of information on pests and diseases that impact the food and fiber system. CSREES sponsors work on the investigation, understanding, and control of zoonotic diseases that pose human health threats, which results in methods and practices to prevent or control outbreaks of exotic, native, and foreign pests and diseases, including invasive pests.

## **PERFORMANCE CRITERIA**

- 3.2.1 Reduce adverse impacts of indigenous and exotic pathogens, toxins, plants, and pests on plant yield and quality (CSREES Problem Area 211).
- 3.2.2 Reduce adverse impacts of indigenous and exotic bacteria, fungi, nematodes, viruses, and other pathogens on plant yield and quality (CSREES Problem Area 212).
- 3.2.3 Reduce adverse impacts of competition from indigenous and exotic weeds, including aquatic weeds and parasitic plants, on plant yield and quality (CSREES Problem Area 213).
- 3.2.4 Reduce adverse impacts of indigenous and exotic vertebrate pests (including birds and mammals), mollusks (including slugs and snails), and other plant pests on plant yield and quality (CSREES Problem Area 214).
- 3.2.5 Improve and enhance the use of natural enemies, including microbial biological control agents, to manage plant pests (CSREES Problem Area 215).
- 3.2.6 Develop and improve integrated control tactics and systems to manage plant pests or pest complexes in an economically, socially, and environmentally sound manner (CSREES Problem Area 216).
- 3.2.7 Improve the management of animal diseases that represent a threat to animal production, biosecurity, or public health (CSREES Problem Area 311).
- 3.2.8 Increase knowledge and improve management of pests and external parasites, including insects, ticks, mites, and other parasitic arthropods that reduce animal productivity (CSREES Problem Area 312).
- 3.2.9 Increase knowledge to control internal parasites such as worms, flukes, and protozoa to reduce losses due to mortality, reduced yield, condemnation of meat, feed wastage, and cost of drugs (CSREES Problem Area 313).
- 3.2.10 Reduce losses in livestock, poultry, and fish arising from toxic chemicals, pesticides, poisonous plants, predators, ingestion of foreign bodies, and other hazards (CSREES Problem Area 314).
- 3.2.11 Develop and implement effective animal care and use methods and systems contributing to the welfare, well-being, and humane treatment of food animals (CSREES Problem Area 315).

## **ACTIONABLE STRATEGIES**

- Sponsor research, education, and extension, including genetic research, to improve the management and control of pests and diseases.
- Sponsor research, education, and extension on rapid, accurate, and cost-effective pest and disease monitoring technologies for early detection and control.
- Sponsor the development of emergency preparedness for mass disposal of plants, animals, tissues, or environmental contaminants posing disease or health threats.
- Sponsor genomic research to better understand the role of genes and proteins in animal and plant immune systems and the effects of pathogens on vulnerable animal species.
- Sponsor research using traditional breeding and biotechnology to develop new or enhanced varieties and germplasm with enhanced disease resistance.
- Sponsor development of new tests that rapidly detect crop and livestock pathogens, by producers, processors, and regulatory agencies.

- Support action to assist the Animal and Plant Health Inspection Service to validate and deploy identification devices that are operational anywhere to rapidly detect pathogens and toxins threatening livestock, poultry, plants, and food.
- Support the development of a national laboratory network for crops and livestock that can rapidly detect pathogen outbreaks and work with APHIS to assess and control outbreaks.
- Support development of knowledge to support approval and licensing by the Environmental Protection Agency of safe and effective disinfectants and pesticides.
- Sponsor research and dissemination of science-based information on the efficacy of chemical usage to fight pests and disease, and to develop strategies to minimize the need for chemical pesticides.
- Sponsor research and education on the use of antimicrobial agents in the food production chain and their effect on the development of resistance in humans.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **STRATEGIC GOAL 4: IMPROVE THE NATION'S NUTRITION AND HEALTH**

Public policies and programs support access to a healthy, nutritious, safe, abundant, and affordable food supply for all citizens. While food and nutrition assistance programs have helped reduce nutritional deficiencies, improving access to healthy and nutritious food for low-income Americans remains a challenge. A large and growing portion of the population faces health risks linked to quality and quantity of diet, as changes in culture and lifestyle affect food selection and consumption. Major causes of mortality – cardiovascular disease, cancer, stroke, and diabetes – are clearly related to diet. Obesity is increasing in all age and ethnic groups.

CSREES sponsors research and analysis to improve the scientific knowledge base concerning nutrition and health, and sponsors education and extension to promote healthy diets, reach children early, ensure access to healthy food, and utilize scientifically valid information to improve food and diet decisions.

### **OBJECTIVE 4.1. IMPROVE HUMAN HEALTH BY BETTER UNDERSTANDING THE NUTRIENT REQUIREMENTS OF INDIVIDUALS AND THE NUTRITIONAL VALUE OF FOODS**

New discoveries in nutritional science linking an individual's health to the nutritional value of foods and the individual's dietary intake increase the need for nutritional research, education, and extension. Understanding the nutrient role of food components and human health and improving the health-promoting value of food is critical in addressing the health issues of today's society.

Development, testing, and release of new technologies and innovative production practices by CSREES partners enhance the nutritional properties of foods and increase accessibility to more healthy and nutritious food products for the entire population. Research and education help

identify and verify new classes of food compounds that play a role in human health through optimal nutrition. Education and training of professionals and practitioners help build consumer acceptance and ensure that relevant, scientifically valid information and recommendations reach consumers. Extension reduces the risk of adoption of unproven and dangerous practices.

### **PERFORMANCE CRITERIA**

- 4.1.1 Improve the nutrient composition of food (CSREES Problem Area 701).
- 4.1.2 Identify the requirements and functions of nutrients and other food components (CSREES Problem Area 702).

### **ACTIONABLE STRATEGIES**

- Sponsor research to identify and characterize biologically active compounds with beneficial health effects in agricultural crops and animals, and improve marketability of health effects of functional foods.
- Sponsor economic analyses of food systems to understand factors affecting food use for consumers.
- Sponsor human nutritional studies on nutritionally enhanced commodities and promising new foods and food components.
- Sponsor development of methods for detection and identification of phyto- and zoo-nutrients to understand the composition of foods.
- Sponsor research to understand the bioavailability of nutrients in foods, the role of nutrition in disease prevention and health promotion, and the health benefits from nutrients and food components.
- Sponsor research to understand the interaction between genes and diet, how genetic diversity affects the use of nutrients and other food components, and the relationship between individual nutrients, whole foods, and whole diet as risk factors and preventative agents for obesity and chronic disease.
- Sponsor research to develop nutrient requirements for all stages of the life cycle.
- Sponsor research to identify, characterize, and modulate biologically active compounds in crops and animals having beneficial health effects, document benefits for humans, and optimize their use through production and processing.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, and educators, and practitioners in the food and agricultural sciences.

### **OBJECTIVE 4.2. PROMOTE HEALTHIER FOOD CHOICES AND LIFESTYLES**

The health of our citizens is partly determined by their food choices and degree of physical activity. A current rise in the obesity level of adults and children is causing an alarming increase in chronic disease and related public health issues.

Through CSREES research, education, and extension activities, scientific and lay understanding of optimal nutrient requirements at all stages of the life cycle is improving. The effects of nutrition education on food choices and dietary intakes are analyzed, and efforts to assist

citizens' behavioral changes and choices aimed at achieving a healthy diet are evaluated. Through education and extension, food selection choices and consumption behaviors that support sustainable healthy lifestyles are promoted.

#### **PERFORMANCE CRITERIA**

- 4.2.1 Assess food intake and dietary patterns, factors that influence these patterns, their interrelationships, and food and nutrient intake in relation to nutrient requirements, dietary guidance, and food plans (CSREES Problem Area 703).
- 4.2.2 Increase understanding of food insecurity, insufficiency, and hunger in the population, and activities to reduce hunger (CSREES Problem Area 704).
- 4.2.3 Increase knowledge and impact of insects, ticks, mites, and other pests that are a threat or annoyance to human health and develop safe, effective, and economical control measures (CSREES Problem Area 721).
- 4.2.4 Identify, understand, and control animal diseases and parasites that pose threats to human health (CSREES Problem Area 722).
- 4.2.5 Develop, evaluate, and disseminate methods and strategies, including screening, immunization, and preventive care to enhance health-related practices (CSREES Problem Area 724).

#### **ACTIONABLE STRATEGIES**

- Sponsor education and extension to decrease obesity, increase physical activity, and increase the intake of fruits and vegetables.
- Sponsor research, education, and extension involving the community in better lifestyle decisionmaking and selection of healthy, nutritious, and convenient foods.
- Sponsor research, education, and extension on food assistance policy, health systems, and community dimensions of nutrition and food security.
- Support the improvement of the quality, quantity, and methods for collecting data to assess dietary and nutritional status and physical fitness.
- Sponsor research on food choices and their determinants, including price, income, education, and environmental and socioeconomic characteristics.
- Sponsor economic analysis of the food marketing system to understand factors affecting food affordability.
- Sponsor analysis of policies, strategies, and programs for sustained changes in eating behavior to improve diet and health, increase exercise, and combat obesity.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **STRATEGIC GOAL 5: PROTECT AND ENHANCE THE NATION'S NATURAL RESOURCE BASE AND ENVIRONMENT**

The effective management of public and private natural resources requires balancing competing goals and interests. While this is often the case in the short term, developing and applying longer term management strategies, combined with adequate knowledge of complex interdependent natural systems, can yield maximum sustainable benefits from our resources that satisfy most competing concerns. Developing a scientific and policy knowledge base and educational and extension efforts to achieve maximum sustainable benefits from both private and common-property natural resources is a goal of CSREES.

### **OBJECTIVE 5.1: PROVIDE SCIENCE-BASED KNOWLEDGE AND EDUCATION TO IMPROVE THE MANAGEMENT OF FOREST AND RANGELANDS**

Forests and rangelands provide a multitude of food, fiber, and forest products, in addition to clean water and air, productive soils, carbon storage, biodiversity, scenic vistas, and recreational opportunities. Utilizing and disseminating accurate, current, scientific information provides the basis for effective multi-use management.

CSREES and its partners collaborate with land owners, industry, citizens, and other interested parties to develop, validate, and disseminate knowledge and methods to provide and evaluate ecosystem management strategies that generate long-term benefits for public and private natural resources, including the mitigation of adverse global change.

#### **PERFORMANCE CRITERIA**

- 5.1.1 Identify and understand biological processes and ecological relationships to improve rangeland management techniques and improve appraisals of range conditions for production of livestock forage, wildlife habitat, and water yield (CSREES Problem Area 121).
- 5.1.2 Develop new wildfire prevention methods; technology for fuel hazard reduction, improved systems for wildfire prediction, detection, and effective attack, and suppression technologies (CSREES Problem Area 122).
- 5.1.3 Improve management of forest plants and trees, forest ecosystem ecology, breeding, forest nursery practices, and silvicultural techniques (CSREES Problem Area 123).
- 5.1.4 Improve urban and suburban environments and enhance visual screening, noise suppression, air quality improvement, shade, and beautification through tree plantings (CSREES Problem Area 124).
- 5.1.5 Improve the integration of trees in farmland and rangeland to improve agricultural production (CSREES Problem Area 125).

## **ACTIONABLE STRATEGIES**

- Sponsor research, education, and extension to improve methods of managing and measuring forest and rangeland health.
- Sponsor research, education and extension on private forest production, harvest, and use.
- Sponsor decision support systems for landowners, citizens, and public officials to evaluate the environmental and economic impacts of resource management policy.
- Sponsor research and technology transfer for forest products utilization.
- Support the recruitment, retention, graduation, and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **OBJECTIVE 5.2: PROVIDE SCIENCE-BASED KNOWLEDGE AND EDUCATION TO IMPROVE THE MANAGEMENT OF SOIL, AIR, AND WATER RESOURCES TO SUPPORT PRODUCTION AND ENHANCE THE ENVIRONMENT**

The production of food and fiber products is critical to our nation, as is the protection and sustenance of its natural resources. Through advances in scientific knowledge and application, providing the essential food supply can be balanced with the protection of soil, air, and water resources.

CSREES sponsors integrated research, education, and extension work to better understand the complex environmental interrelationships affecting agricultural, forest, and rangeland production practices; to improve scientific and lay understanding of water, soil, and air for better production management; and to minimize adverse environmental impacts.

## **PERFORMANCE CRITERIA**

- 5.2.1 Identify soil parameters for crop production, forest and rangeland management, housing, zoning, planning, and other land uses (CSREES Problem Area 101).
- 5.2.2 Understand chemical and physical relationships among soils, plants, water, and nutrients to improve or restore soil production capability (CSREES Problem Area 102).
- 5.2.3 Improve the management of saline and sodic soils (CSREES Problem Area 103).
- 5.2.4 Protect soils from harmful effects of natural elements (CSREES Problem Area 104).
- 5.2.5 Increase efficiency in collecting, storing, conveying, and using water (CSREES Problem Area 111).
- 5.2.6 Improve soil and water management at whole watershed level (CSREES Problem Area 112).
- 5.2.7 Improve knowledge and understanding of alternative uses of land (CSREES Problem Area 131).
- 5.2.8 Increase knowledge and understanding of the impact of weather and climate on agriculture and natural resources (CSREES Problem Area 132).
- 5.2.9 Prevent and mitigate pollution from agricultural and forestry practices and its effects on plants, animals, soil, air, water, and humans (CSREES Problem Area 133).

- 5.2.10 Determine biological and ecological needs of species, factors affecting population dynamics, maintaining and enhancing habitats, and managing for sustained wildlife harvest, population, species, and community viability (CSREES Problem Area 135).
- 5.2.11 Preserve, enhance, and restore natural biodiversity to levels compatible with societal uses of natural resources (CSREES Problem Area 136).
- 5.2.12 Improve knowledge, understanding, and management of emissions, fate and transport, and practices to mitigate agricultural and forestry emissions (CSREES Problem Area 141).
- 5.2.13 Improve the effectiveness of collecting, storing, transporting, treating, and utilizing waste products from agriculture, forestry, and other origins (CSREES Problem Area 403)
- 5.2.14 Develop and improve equipment, systems, operation, and maintenance of drainage and irrigation systems (CSREES Problem Area 405).
- 5.2.15 Define and understand relationships between agricultural production and processing and the environment and natural resource use (CSREES Problem Area 605).

### **ACTIONABLE STRATEGIES**

- Sponsor development and dissemination of science-based information on soil composition, especially carbon components and internal ecosystems.
- Sponsor research analyzing and assessing the effects of natural resource and environmental policies on agricultural, aquacultural, forest, and rangeland production.
- Sponsor assessment of the benefits of farming systems and land management practices to remediate, maintain, or improve soil quality and limit losses of nutrients and chemicals to water and air.
- Sponsor development and transfer of management practices to effectively and safely use wastes and byproducts to improve soil quality and provide nutrients for crops.
- Sponsor assessment of the policy and economic benefits of best management practices, technologies, and decision tools to control gaseous and particulate emissions from croplands and concentrated animal feeding operations.
- Sponsor decision support systems for citizens and public officials to evaluate the environmental and economic impacts of policy options for sustainable renewable resource management.
- Sponsor research, education, and extension to develop and use improved germplasm for renovation and restoration of degraded pasture and rangelands.
- In collaboration with the Forest Service, foster and support research and technology transfer for forest products utilization and multidisciplinary forest and rangeland management.
- Support the recruitment, retention, graduation and placement of the next generation of research scientists, educators, and practitioners in the food and agricultural sciences.

## **MANAGEMENT GOALS**

Improved CSREES management of its programs leads to more efficient operations that result in better customer service and more effective investment of taxpayers' dollars.

### **IMPROVE HUMAN CAPITAL PLANNING**

CSREES is working with the other three REE agencies to develop a Human Capital Plan in line with the Department's Plan and the President's Management Agenda. The Plan will focus on strategic workforce planning and maximizing employee performance, while meeting the challenges of developing a work force for the future that is technologically competent, responsive, and effective, providing customer service and business skills and supporting a broader scope of program responsibilities. The Plan will provide the framework to support new and innovative human resources solutions for today's business needs of our customers and to meet tomorrow's challenges.

### **UTILIZE COMPETITIVE SOURCING**

Through a strategic planning process and development of an approach customized to the REE Mission Area, competitive sourcing is one of several tools that can be used in workforce planning or restructuring efforts to improve CSREES operational and organizational efficiencies. The agency will balance the commitment to improve operational efficiency with minimizing disruption to its ongoing operations and workforce. The REE Competitive Sourcing Working Group, including management officials from CSREES, will provide guidance and leadership for this program.

### **IMPROVE FINANCIAL MANAGEMENT**

A fundamental CSREES responsibility is to wisely invest taxpayer dollars in research, education, and extension. The agency will develop and enhance operational financial skills to sustain clean audit opinions, and to meet shortened year-end closing and audited financial statement deadlines. The agency will work closely with the REE Under Secretary, the Office of the Chief Financial Officer, and the Office of the Inspector General to improve financial management and eliminate any material weaknesses.

CSREES will enhance and maintain real and personal property accountability to sustain clean annual audit opinions. This will involve working cooperatively with USDA to design, convert, and implement the Department's Corporate Property Automated Information System, ensure accurate and timely annual property inventories, and obtain clean real and personal property annual audit opinions from the Office of the Inspector General.

## **EXPAND ELECTRONIC GOVERNMENT**

The USDA e-Government Strategic Plan establishes a clear mission, vision, and set of enterprise-wide goals and objectives for e-Government. In collaboration with the Research, Education, and Economics Mission Area, CSREES has developed an e-Government Tactical Plan that guides transformation of business processes to fulfill USDA requirements and improve service to its university and other partners. Specifically, the Plan focuses on integrated investment approaches and supporting cross-cutting activities carried out by the agency to facilitate collaborative delivery of its programs. Consistent with this effort, CSREES is transforming, enhancing, and expanding the delivery of its programs by adopting innovative electronic solutions to provide better, cheaper, and faster service to the public.

## **ESTABLISH BUDGET AND PERFORMANCE INTEGRATION**

CSREES is improving management by preparing performance-based budgets in accordance with the President's Management Agenda, the Office of Management and Budget, and the Department. USDA's Strategic Plan, the REE Strategic Plan, and the CSREES Strategic Plan all support the budget and performance integration process to demonstrate the relationship between program funding levels and expected results.

CSREES program budgets are aligned by outcome goals and output targets. The cost of programs and their outputs will be integrated with performance and budget requests and execution. Program effectiveness will be documented, and the analyses will show how program outputs and policies affect desired agency outcomes. CSREES program results will assist the Administrator in making informed budget decisions and will provide national program leaders with a starting point for monitoring agency performance.

## **ENHANCE PORTFOLIO MANAGEMENT**

Superior program management is a key to effective organization, ensuring that CSREES programs are relevant to clearly articulated goals and objectives, outputs are of high quality, and programs are productive. To effectively accomplish its mission, CSREES will expand existing processes or develop new ones for assessing portfolios of programs and projects with common agency, REE, and USDA long-term goals. Conducted on a cyclical basis by external panels of experts, portfolio reviews will provide the agency with rigorous feedback regarding past performance and recommendations to improve future performance. The relevance, quality, and performance investment criteria developed by OMB and OSTP are used in the portfolio evaluations. An external panel will review all agency programs by 2008.

## **APPENDIX 1**

### **CSREES PROBLEM AREA CLASSIFICATION**

#### **TOPIC I. NATURAL RESOURCES AND ENVIRONMENT**

##### **SOIL**

- 101. Appraisal of Soil Resources
- 102. Soil, Plant, Water, Nutrient Relationships
- 103. Management of Saline and Sodic Soils and Salinity
- 104. Protect Soil from Harmful Effects of Natural Elements

##### **WATER**

- 111. Conservation and Efficient Use of Water
- 112. Watershed Protection and Management

##### **FOREST AND RANGE RESOURCES**

- 121. Management of Range Resources
- 122. Management and Control of Forest and Range Fires
- 123. Management and Sustainability of Forest Resources
- 124. Urban Forestry
- 125. Agroforestry

##### **NATURAL RESOURCES, GENERAL**

- 131. Alternative Uses of Land
- 132. Weather and Climate
- 133. Pollution Prevention and Mitigation
- 134. Outdoor Recreation
- 135. Aquatic and Terrestrial Wildlife
- 136. Conservation of Biological Diversity

##### **AIR**

- 141. Air Resource Protection and Management

#### **TOPIC II. PLANTS AND THEIR SYSTEMS**

##### **PLANT PRODUCTION**

- 201. Plant Genome, Genetics, and Genetic Mechanisms
- 202. Plant Genetic Resources
- 203. Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204. Plant Product Quality and Utility (Preharvest)
- 205. Plant Management Systems
- 206. Basic Plant Biology

## **PLANT PROTECTION**

- 211. Insects, Mites, and Other Arthropods Affecting Plants
- 212. Pathogens and Nematodes Affecting Plants
- 213. Weeds Affecting Plants
- 214. Vertebrates, Mollusks, and Other Pests Affecting Plants
- 215. Biological Control of Pests Affecting Plants
- 216. Integrated Pest Management Systems

## **TOPIC III. ANIMALS AND THEIR SYSTEMS**

### **ANIMAL PRODUCTION**

- 301. Reproductive Performance of Animals
- 302. Nutrient Utilization in Animals
- 303. Genetic Improvement of Animals
- 304. Animal Genome
- 305. Animal Physiological Processes
- 306. Environmental Stress in Animals
- 307. Animal Management Systems
- 308. Improved Animal Products (Before Harvest)

### **ANIMAL PROTECTION**

- 311. Animal Diseases
- 312. External Parasites and Pests of Animals
- 313. Internal Parasites in Animals
- 314. Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
- 315. Animal Welfare/Well-Being and Protection

## **TOPIC IV. AGRICULTURAL, NATURAL RESOURCE, AND BIOLOGICAL ENGINEERING**

- 401. Structures, Facilities, and General Purpose Farm Supplies
- 402. Engineering Systems and Equipment
- 403. Waste Disposal, Recycling, and Reuse
- 404. Instrumentation and Control Systems
- 405. Drainage and Irrigation Systems and Facilities

## **TOPIC V. FOOD AND NON-FOOD PRODUCTS: DEVELOPMENT, PROCESSING, QUALITY, AND DELIVERY**

### **FOOD**

- 501. New and Improved Food Processing Technologies
- 502. New and Improved Food Products
- 503. Quality Maintenance in Storing and Marketing Food Products
- 504. Home and Commercial Food Service

**NON-FOOD**

- 511. New and Improved Non-Food Products and Processes
- 512. Quality Maintenance in Storing and Marketing Non-Food Products

**TOPIC VI. ECONOMICS, MARKETS, AND POLICY**

- 601. Economics of Agricultural Production and Farm Management
- 602. Business Management, Finance, and Taxation
- 603. Market Economics
- 604. Marketing and Distribution Practices
- 605. Natural Resource and Environmental Economics
- 606. International Trade and Development
- 607. Consumer Economics
- 608. Community Resource Planning and Development
- 609. Economic Theory and Methods
- 610. Domestic Policy Analysis
- 611. Foreign Policy and Programs

**TOPIC VII. HUMAN NUTRITION, FOOD SAFETY, AND HUMAN HEALTH AND WELL-BEING**

**HUMAN NUTRITION**

- 701. Nutrient Composition of Food
- 702. Requirements and Function of Nutrients and Other Food Components
- 703. Nutrition Education and Behavior
- 704. Nutrition and Hunger in the Population

**FOOD SAFETY**

- 711. Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712. Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**HUMAN HEALTH**

- 721. Insects and Other Pests Affecting Humans
- 722. Zoonotic Diseases and Parasites Affecting Humans
- 723. Hazards to Human Health and Safety
- 724. Healthy Lifestyle

**TOPIC VIII. HUMAN AND COMMUNITY SYSTEMS**

- 801. Individual and Family Resource Management
- 802. Human Development and Well-Being
- 803. Sociological and Technological Change Affecting Individuals, Families, and Communities

- 804. Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805. Community Institutions, Health, and Social Services

**TOPIC IX. PROGRAM AND PROJECT SUPPORT, ADMINISTRATION, AND COMMUNICATION**

- 901. Program and Project Design, and Statistics
- 902. Administration of Projects and Programs
- 903. Communication, Education, and Information Delivery

## APPENDIX 2

### INTEGRATION OF CSREES STRATEGIC GOALS AND OBJECTIVES, PORTFOLIOS, AND PROBLEM AREA CLASSIFICATION

#### Goal 1: Enhance Economic Opportunities for Agricultural Producers

*Objective 1.1: Provide Information, Knowledge, and Education to Help Expand Markets and Reduce Trade Barriers*

- Portfolio 1.1. Agricultural Markets and Trade
- 603. Market Economics
  - 604. Marketing and Distribution Practices
  - 610. Domestic Policy Analysis

*Objective 1.2: Support International Economic Development and Trade Capacity-Building through Research, Education, and Extension*

- Portfolio 1.2. International Economic Development
- 606. International Trade and Development Economics
  - 611. Foreign Policy and Programs

*Objective 1.3: Provide Science-Based Knowledge and Technologies to Generate New or Improved High-Quality Products and Processes to Expand Markets for the Agricultural Sector*

- Portfolio 1.3. Agricultural and Food Processing/Biobased Products
- 501. New and Improved Food Processing Technologies
  - 502. New and Improved Food Products
  - 503. Quality Maintenance in Storing and Marketing Food Products
  - 504. Home and Commercial Food Service
  - 511. New and Improved Non-Food Products and Processes
  - 512. Quality Maintenance in Storing and Marketing Non-Food Products

*Objective 1.4: Provide Science-Based Information, Knowledge, and Education to Facilitate Risk Management by Farmers and Ranchers*

- Portfolio 1.4. Structure of the Agricultural Sector and Farm Management
- 401. Structures, Facilities, and General Purpose Farm Supplies
  - 402. Engineering Systems and Equipment
  - 404. Instrumentation and Control Systems
  - 601. Economics of Agricultural Production and Farm Management

***Objective 1.5: Contribute Science-Based Information, Analysis, and Education to Promote the Efficiency of Agricultural Production Systems***

Portfolio 1.5.1. Plant Production

201. Plant Breeding, Genome, Genetics, and Genetic Mechanisms
202. Plant Genetic Resources and Biodiversity
203. Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204. Plant Product Quality and Utility (Preharvest)
205. Plant Management Systems
206. Basic Plant Biology

Portfolio 1.5.2. Animal Production

301. Reproductive Performance of Animals
302. Nutrient Utilization in Animals
303. Genetic Improvement of Animals
304. Animal Genome
305. Animal Physiological Processes
306. Environmental Stress in Animals
307. Animal Production Management Systems
308. Improved Animal Products (Before Harvest)

**Goal 2: Support Increased Economic Opportunities and Improved Quality of Life in Rural America**

***Objective 2.1: Expand Economic Opportunities in Rural America by Bringing Scientific Insights into Economic and Business Decisionmaking***

Portfolio 2.1. Expand Economic Opportunities through Economic and Business Decisionmaking

134. Outdoor Recreation
602. Business Management, Finance, Taxation, and Estate Planning
608. Community Resource Planning and Development
609. Economic Theory and Methods
805. Community Institutions, Health, and Social Services
901. Program and Project Design, and Statistics
902. Administration of Projects and Programs
903. Communication, Education, and Information Delivery

***Objective 2.2: Provide Science-Based Technology, Products, and Information to Facilitate Informed Decisions Affecting the Quality of Life in Rural Areas***

Portfolio 2.2. Informed Decisions Affecting Quality of Life in Rural Areas

607. Consumer Economics
723. Hazards to Human Health and Safety
801. Individual and Family Resource Management
802. Human Development and Well-Being
803. Sociological and Technological Change Affecting Individuals, Families, and

Communities

804. Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

### **Goal 3: Enhance Protection and Safety of the Nation's Agriculture and Food Supply**

#### ***Objective 3.1: Reduce the Incidence of Foodborne Illnesses and Contaminants through Science-Based Knowledge and Education***

Portfolio 3.1. Reduce the Incidence of Foodborne Illnesses and Contaminants

- 711. Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712. Protect Food From Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

#### ***Objective 3.2: Develop and Deliver Science-Based Information and Technologies to Reduce the Number and Severity of Agricultural Pest and Disease Outbreaks***

Portfolio 3.2. Reduce the Number and Severity of Agricultural Pest and Disease Outbreaks

- 211. Insects, Mites, and Other Arthropods Affecting Plants
- 212. Pathogens and Nematodes Affecting Plants
- 213. Weeds Affecting Plants
- 214. Vertebrates, Mollusks, and Other Pests Affecting Plants
- 215. Biological Control of Pests Affecting Plants
- 216. Integrated Pest Management Systems
- 311. Animal Diseases
- 312. External Parasites and Pests of Animals
- 313. Internal Parasites in Animals
- 314. Toxic Chemicals, Poisonous Plants and Naturally Occurring Toxins and Other Hazards Affecting Animals
- 315. Animal Welfare, Well Being, and Protection

### **Goal 4: Improve the Nation's Nutrition and Health**

#### ***Objective 4.1. Improve the Nutritional Value of the U.S. Food Supply by Enhancing the Health-Promoting Properties of Food Products***

Portfolio 4.1. Improve the Nutritional Value of the U.S. Food Supply

- 701. Nutrient Composition of Food
- 702. Requirements and Function of Nutrients and Other Food Components

#### ***Objective 4.2 Promote Healthier Food Choices and Lifestyles through Research and Education***

Portfolio 4.2. Promote Healthier Food Choices and Lifestyles

- 703. Nutrition Education and Behavior
- 704. Nutrition and Hunger in the Population
- 721. Insects and Other Pests Affecting Humans
- 722. Zoonotic Diseases and Parasites Affecting Humans
- 724. Healthy Lifestyle

## **Goal 5: Protect and Enhance the Nation's Natural Resource Base and Environment**

### ***Objective 5.1: Provide Science-Based Knowledge and Education to Improve the Management of Forests and Rangelands***

#### Portfolio 5.1. Management of Forests and Rangelands

- 121. Management of Range Resources
- 122. Management and Control of Forest and Range Fires
- 123. Management and Sustainability of Forest Resources
- 124. Urban Forestry
- 125. Agroforestry

### ***Objective 5.2: Provide Science-Based Knowledge and Education to Improve the Management of Soil, Air, and Water to Support Production and Enhance the Environment***

#### Portfolio 5.2. Management of Soil, Air, and Water

- 101. Appraisal of Soil Resources
- 102. Soil, Plant, Water, Nutrient Relationships
- 103. Management of Saline and Sodic Soils and Salinity
- 104. Protect Soil from Harmful Effects of Natural Elements
- 111. Conservation and Efficient Use of Water
- 112. Watershed Protection and Management
- 131. Alternative Uses of Land
- 132. Weather and Climate
- 133. Pollution Prevention and Mitigation
- 135. Aquatic and Terrestrial Wildlife
- 136. Conservation of Biological Diversity
- 141. Air Resource Conservation and Management
- 403. Waste Disposal, Recycling, and Reuse
- 405. Drainage and Irrigation Systems and Facilities
- 605. Natural Resource and Environmental Economics