Draft

(June 19, 1998)

Medium Term Strategic Plan
1999 - 2003

State Agricultural Experiment Station System

Experiment Station Section
Board on Agriculture
National Association of State Universities and Land-Grant Colleges
Fall, 1998

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A Medium Term (1999-2003) Strategic Plan for the State Agricultural Experiment Station System[1]

Summary

This strategic plan[2] represents a comprehensive road map of national strategies for the agricultural[3] research activities conducted by the State Agricultural Experiment Station (SAES) System, and in partnership with others. This document communicates the strategic targets and some related action items we will undertake for the benefit of the System's users (i.e., customers, consumers, stakeholders, agricultural leaders, and decision makers). We are looking for new ways to enhance the System's

performance and to report on our research impacts. Our plan is a dynamic, working document. Periodic up dates will be issued as needed.

Through this plan the SAES System renews its commitments to the Land-Grant University's fundamental paradigm that integrates teaching, research and extension for maximum public benefit. This renewal will allow the System to provide more concerted efforts when responding to the publicly relevant issues, previously voiced in successive citizen engagement sessions.

The SAES System has comparative advantages that allow it to provide publically relevant knowledge and information. Paramount among these is our long-term collaborations within and among Land-Grant institutions, and our partnership with the federal government through the USDA's Cooperative State Research, Education, and Extension Service (CSREES). This strategic plan builds on these relationships, and extends the partnership strategy in new ways, to serve the public better.

The System also plans to more broadly define its mission to better address publicly relevant issues, and to provide better research support for the extension and teaching missions of our paradigm partners. Additionally, the SAES System will use the five goals[4] jointly derived with our partners as a framework for planning national research activities, and for reporting research results through mechanisms such as those required by the Government Performance and Results Act of 1993.

The SAES System views itself as an entity greater than the sum of its parts, as a result of extensive coordinated research project planning and collaborations within the SAES network. The SAES System is seeking even greater enhanced performance as a "System." This outcome will be realized primarily as:

- Improved scientific quality of our research;
- Enhanced responsiveness to our stakeholders;
- More stakeholder relevance in our research activities;
- Better integration of our research with extension and teaching;
- Better transfer of new technologies to our intended U.S. users;
- A stronger partnership with the federal government;
- Budget requests linked to strategic priorities;
- More accountability; and
- Greater public confidence in the SAES System.

To assure the quality of the System's research, its responsiveness, and its relevance to stakeholders, several significant changes are being implemented. The SAES System is:

- Expanding its capacity to engage our customers, to better respond to their needs;
- Reorganizing its national research portfolio, to better address our customers' needs;
- Expanding its use of peer review, to enhance evaluations of scientific merit;
- Maintaining an inventory of national research capacity, to better manage its strengths;
- Refocusing its research, to better obtain societal, economic, and environmental benefits;
- Building new coalitions, to more fully accomplish its research objectives; and
- More vigorously communicating the System's accomplishments and successes.

This plan offers the opportunity to pass to future generations:

- A more environmentally friendly and sustainable U.S. agriculture;
- Increased satisfaction with the harvested and processed products of U.S. agriculture;
- More nutritious and safer foods for healthier Americans;
- Improved quality of life for all American citizens; and
- Stronger families and communities.

At the same time:

- U.S. farmers, ranchers, and rural communities will benefit from increased productivity and profitability;
- The commerce of U.S. agriculture will become more diversified;
- Consumers will have a safer and more nutritious food supply;
- The managers of our nation's natural resources will be more informed;
- Global marketing of U.S. agricultural products will expand; and
- American jobs will be created.

The SAES System recognizes that the future holds many unknowns, and significant resource constraints may limit our achievements. Given the public's expectations for solving the important agricultural, environmental and social issues identified

through our listening sessions, the System's agenda is clear. And, given past high rates of return for agricultural research expenditures, these proposed research investments are well justified.

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A Medium Term (1999-2003) Strategic Plan for the State Agricultural Experiment Station System

Vision Statement

The SAES System will be viewed by its primary stakeholders, and by the general public, as the premier providers of scientific research-based agricultural, human, and natural resource knowledge that is relevant, useful, and timely for addressing current and future problems, and for creating opportunities to further enhance public well being.

Mission Statement

The SAES System, in partnership with the U.S. Department of Agriculture, using a decentralized network of participants, provides the relevant and appropriate scientific knowledge and the research capacity needed for: an economically viable and environmentally sustainable food, forest, ornamental and fiber production system; a safe, dependable, nutritious, diverse, and affordable food supply; and the preservation and protection of natural resources; all leading to a satisfactory quality of life for all citizens and their communities. The SAES System will work cooperatively with academic programs, the extension system, federal and state agencies, and industry to meet the broader goals of its clientele. We will do this through the development of new knowledge in the biological, physical and social sciences.

Background

Strategic planning within the State Agricultural Experiment Station[5] (SAES) System has, for nearly two decades, been primarily focused on describing a national "strategic agenda" of ranked agricultural research priorities. This process has recently given way to a more integrated approach that has brought together the Land-Grant University functions (i.e., teaching, extension and research) to identify common issues leading to action. This "Issues to Action"[6] process involved a series of regional listening sessions followed by a synthesis of issues leading to a plan of action. The entire activity was premised on determined efforts to streamline collaborations among the Land-Grant Universities, and across functions. This most recent cross functional planning effort has set the stage for a new approach to strategic planning for the SAES System.

The SAES System is interested in receiving comments, endorsements, recommendations, criticisms, and points-of-concern in response to this plan as the SAES Directors organize the System's programs and allocate their resources for the next five years.

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The Purposes of Agricultural Research

The Agricultural Research, Extension and Education Reform Act of 1998 (a.k.a. the Farm Bill) lists the following management principles as important to the purposes of agricultural research, extension, and education.

"*(d) MANAGEMENT PRINCIPLES- To the maximum extent practicable, the Secretary shall ensure that federally supported and conducted agricultural research, extension, and education activities are accomplished in a manner that--*

> *(1) integrates agricultural research, extension, and education functions to better link research to technology transfer and information dissemination activities;*
>
> *(2) encourages regional and multistate programs to address relevant issues of common concern and to better leverage scarce resources; and*
>
> *(3) achieves agricultural research, extension, and education objectives through multi-institutional and multifunctional approaches and by conducting research at facilities and institutions best equipped to achieve those objectives."*

The SAES System has adopted these purposes as a foundation for this strategic plan.

In addition, the SAES System, in partnership with the USDA's Research, Education, and Economics (REE) mission area and its Cooperative State Research, Education, and Extension Service (CSREES), and with substantial customer input, have identified five strategic goals[7]. The five goals are:

- An agricultural system that is highly competitive in the global economy;
- A safe and secure food and fiber system;
- A healthy, well nourished population;
- An agricultural system which enhances natural resources and the environment; and
- Enhanced economic opportunity and quality of life for Americans.

These five goals provide an accurate and well defined framework for the SAES System's strategic planning efforts, and thus the five Federal-State Partnership's goals have been adopted for this planning process as well.

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Stakeholder Identified Needs

In several recent national and regional listening sessions, and through continuing customer engagements, the SAES System has identified a number of customer-important needs and priorities. These have been assembled into a list of customer-identified issues, stated as the need to have:

- Technologies for reasonable farm and ranch productivity and profitability;
- Technologies that are integrated, and proven on a realistic scale;
- Methods of production that are sustainable, and environmentally friendly;
- Resolution of public and scientific concerns for agriculture's over-reliance on pesticides and fertilizers;
- Informed management of our natural resources; including soils, water, air, and biota;
- A supply of nutritious and safe foods for all Americans;
- Answers for growing consumer demands for a reliable, secure, accessible and affordable food and fiber supply;
- Research emphasis on technologies that create jobs, and distribute benefits equitably;
- Technologies that will allow U.S. agriculture to remain internationally competitive in the emerging global market place;
- Management technologies that are more geographically precise;
- Technologies that add value to harvested products;
- Technologies that development and enhance the well being of all citizens, urban and rural; and
- Knowledge to help individual, family, and community development.

The SAES System accepts the challenge to address these customer-identified needs, and it will continue to use existing resources, redirect resources, and seek additional resources to provide science-based solutions.

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Assumptions

This strategic plan rests on a set of fundamental external and internal assumptions. The external assumptions are:

- Consumer demand for safe, high quality, accessible, and low cost foods and other biological products with a diversity of selections will continue to expand, both domestically and globally.
- Pressure for the uses of land other than agriculture will continue to increase.
- Citizen concerns for environmental problems will intensify, many of which may have links to agricultural practices.
- Science, in support of agriculture, will operationally continue to become more global.
- Concern for the continued vitality of our rural infrastructure will remain.
- New and better methods will be created for interstate and regional planning for research, extension, and teaching.
- New and better methods will be created for documenting and communicating research accomplishments.

The internal assumptions are:

- Federal base funding (a.k.a. Hatch Act funding) will continue to support SAES System activities, and to define the System's membership.
- The leveraging of federal base funds from other sources will continue to amplify our resources.
- The Federal-State Partnership will be expanded to additional federal agencies.

- New types of partnerships will be organized with the private sector.
- Stronger collaborations will be formed with the LGU extension and teaching functions.
- New and better methods will be created for listening to our customers, stakeholders, agricultural leaders, decision makers, and supporters.

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Guiding Principles

The SAES System has a heritage of providing relevant agricultural research results for meeting customer needs, and solving real world problems. It is also proud of its responsiveness to agricultural production crises and human emergencies. These characteristics are the hallmarks of the LGUs, and can be traced to their institutional paradigm that integrates teaching, research, and extension. And, it is their public service philosophy that provides the characteristics that distinguish LGUs from other types of research institutions.

Analyses of rates of return on agricultural research investments typically exceed 30% to 50 % annually. Few, if any, areas of research pay dividends that approach those of agriculture. The unique coupling of basic and applied research activities at the SAESs is said to account for these very high rates of return.

Considerable experience has been derived from developing the world-renowned Land-Grant Universities, including the SAES System. This experience has led to a number of guiding principles for developing a national agricultural research strategic plan for the SAES System. These principles are:

- The success of agricultural research is based on a distributed, pluralistic system. Centralized facilities and programs for agricultural research are less effective because agricultural constraints and research opportunities are often site specific.
- A distributed system for the management of scientific research is essential for intellectual creativity.
- The Federal-State Partnership in agricultural research has evolved as a special and valuable working relationship. Federal base funding is an essential component for the success of this partnership. It allows the federal partner to participate in decision making at the regional, state, and local levels, while leveraging their investments with non-federal funds.
- Regional Research affords the SAES system great strategic advantage for tackling some of agriculture's most difficult social, economic and environmental issues. These issues are frequently not limited by a State's political boundaries.
- The Land-Grant University's paradigm, which integrates teaching, research, and extension, is globally unique, well respected, and recognized worldwide as an institutional paradigm worthy of emulation.
- Configuring national and regional competitive grants, commodity support, industry grants, and special research grants, along with federal base and state funding, allows SAES Directors to provide for the immediate needs of customers while investing in research for agriculture's future[8].
- Each SAES conducts research relevant to state and regional priorities. Collectively, these individual state research programs comprise the national research portfolio.

Decision-makers today expect more responsiveness from public programs, and better measures of impacts and benefits from public research investments. This expectation requires more informed management decisions on future outlays by SAES Directors. Directors in turn, must give greater attention to planning and accountability, while preserving and working within these guiding principles.

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Environmental Assessments

External Factors:

- **The Global Marketplace**. In the post-Cold War era new incentives for science investments have emerged, with considerable emphasis on global market competitiveness. Today, many nations are acknowledging the need to invest in science in order to remain (or become) competitive in the global marketplace.
- **Urban/Agricultural/Environmental Interface.** Population growth and shifting demographics are impacting agricultural production systems. Significant land use, zoning, pest management, and resource management issues have result as from

this shift of population.

- **Consumer Demand for Quality and Safety of Food Supply**. Recent outbreaks of food poisoning from *E. coil* have brought heightened attention to food safety problems. In addition, concern over pesticide residues, possible implications from altering the quality of food supplies through biotechnology, and transmission of diseases from animals to humans combine to heighten the public's concern on food safety.

- **Evolving Stakeholder Expectations.** Commodity representatives, consumer advocacy organizations, environmental interest groups, non-governmental organizations, industry leaders, and elected representatives are today more directly expressing their needs and priorities to SAES scientists and directors. In the aggregate, expectations vastly exceed the Systems' available research capacity. Thus, informed management decisions are needed to best allocate available resources.

- **Structural Changes in Agriculture.** The merging of formerly separate industries in agriculture (e.g. seed and chemicals) and vertical integration are significant factors causing change in American agriculture. Structural changes in agriculture result in a multi-modal agriculture. Simplistic depictions of the structure of U.S. agriculture fail to show the complex nature of the various types of U.S. farming and ranching enterprises. Moreover, the diversity of agricultural enterprises is expanding, further complicating the SAES's system's strategies for meeting public expectations.

- **Expansion of the Clientele-Base for LGU**. Changing expectations of public institutions and the United State's demographic transformation from the predominant rural/farming economy of six decades ago to today's mixed economy has shifted responsibilities of the Land-Grant Universities. This change has caused a constant tension between providing research results for the needs of traditional production agriculture, and the added research responsibilities to address natural resource management, environmental topics, and consumer, family and community issues.

- **Calls for Accountability.** Closer scrutiny of public sector investments in agricultural research is leading to calls from elected representatives for greater program accountability and more documented justification for budget requests. Federally, this call is manifested in the Government Performance and Results Act (GPRA) which requires federal agencies to use strategic planning-based impact assessments as a process for deciding future resource allocations. This requirement is directly impacting the management decisions of the Federal-State Partnership in agricultural research.

- **Concerns for Global Food and Fiber Supply and Security.** The long term sustainability of the nation's food and fiber supply is a standing concern. These concerns are linked to global population issues, and the need to respond responsibly to the growing worldwide demands for agricultural products. These demands are projected to increase in the next few decades.

- **The Focus on Sustainability**. A major paradigm shift to sustainable agriculture has occurred in the past two decades. This shift in emphasis toward sustainability is noteworthy, and represents a significant challenge for the agricultural research community that cannot be ignored.

- **Private Sector Research.** A strong U.S. private sector agricultural research enterprise has emerged, which by some estimates now accounts for 60% of the annual national investment in agricultural research. This emergence is causing a shift in the demarcation of research responsibilities between the public and the private sectors. Much of this change is driven by reinterpretations of intellectual property rights laws that were intended to encourage private sector investment in the areas formerly the responsibility of the public sector.

- **Public-Private Sector Partnerships.** Partnerships between the public and private sectors are evolving to higher levels of collaboration, especially in the "pre-technology sciences" (*sensu* Huffman and Evenson). University partnerships with industry can also effectively transmit new technologies to the market place and are complementary to extension when properly organized.

- **Declining Farm Representation.** Agricultural technology successes in the past half century have contributed to a decline in the number of people directly engaged in farming. Related to this trend is the consequent reduction in the proportion of elected representatives who are farmers, or even know about farming. This outcome complicates the process of communicating agricultural research needs, opportunities, and achievements to our elected representatives.

- **Policy Decisions**. The consequences of federal, state, and local agricultural and environmental policy decisions will continue to complicate agricultural research choices for program managers.

- **Multiple Claimants.** A consequence of having multiple institutional claimants, each with an agenda, is the pressure to preserve existing patterns of expenditures. Often, such groups have the political clout to enforce their demands.

Redirection of programs into new initiatives or emerging technologies, in the face of ever constrained resources, leads to challenges in research management at SAES's.

Internal Factors:

- **Financial constraints.** SAES's financial constraints, mostly resulting from budget cuts in many states and static federal funding, have forced tough management decisions at many Stations. Consequently:

  - New research opportunities may not be pursued;
  - Necessary maintenance is deferred;
  - Operating budgets are reduced; and
  - Open positions are left vacant.

  Due to these financial constraints, it is difficult for the System to engage in new initiatives or to begin significant investments in emerging technologies. However, significant redirection of effort have occurred during the past decade.

- **Extension's Agenda Shift.** The SAES's national research agenda may need to include some research topics that have previously been excluded. This need is most evident in the SAES relationship to extension, wherein several major extension activities are not now well supported by research activities (e.g. Managing Change in Agriculture, Youth at Risk). Not all extension needs for research based information can be met by SAES's, however.

- **Public and Private Sector Responsibilities.** The traditional division of responsibilities between the public and private sectors is undergoing rapid change, much of which is driven by new technologies and markets for goods and services formally provided by the public sector. There remains, however, a strong need for public institutions to provide public goods not otherwise provided by the private sector. Sorting out these responsibilities is a major challenge to both the private and public sectors.

- **Multi-disciplinary Research.** Increased demand and expanded opportunity for multi-disciplinary research teams have caused a shift in the expectations for collaboration and research management support. This represents a major challenge to the SAES system.

- **Systems Science Approach to Research Problems**. There is an increasing expectation from research faculty for support of Systems Science research by management. Systems Science is a more holistic approach to the inter-relationships of component parts, and differs significantly from the more traditional reductionist approaches to problem solving.

- **Emerging Technologies.** New technologies are emerging that offer exciting opportunities for agricultural research. Among these topics are: plant and animal genomic mapping; genetic engineering; precision agriculture; value-added technologies for harvested products; and applications of computing and electronic communications in agriculture. These topics reflect the high cost of many contemporary agricultural research activities. Currently, the SAES System is underinvested in these and other topic areas, vis-a-vis needed initiatives and emerging technologies.

- **Paradigm Stress.** The current funding stress faced by LGU's is threatening the fundamental paradigm of the institution, and its SAES component. Institutional downsizing has created programmatic gaps on many campuses that cannot be easily filled by reassignments or reorganization. The System's capacity is threatened by these changes. Survival of many LGU Colleges of Agriculture and their SAES is a serious concern.

- **Intellectual Property Rights.** The management of intellectual property rights and the associated earned royalties, has on many campuses, become a serious concern. How these resources can better contribute to the mission of the institution and the collective SAES system is in need of attention.

- **Institutional Changes.** The evolution of the Land Grant Universities is bringing significant changes to the structure, organization and focus of research and education. This shifting pattern of institutional make-up needs to be recognized in any national strategic planning effort.

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Comparative Advantages

The SAES System has important comparative advantages that contribute to its strength and uniqueness. The SAES System is:

- **Nationally Distributed,** with multiple sites within each state. This distributed System offers a network of research stations which provide diverse environments and conditions for research. Having a System of research stations also permits the early detection and monitoring of agricultural problems and environmental conditions in ways that support the collective agricultural research network.

- **A Land-Grant University Participant,** in the tripartite mission**.** The synergism derived from the institutional integration of teaching, research, and extension has substantial and well recognized social, environmental, and economic benefits.

- **A Component of the Federal-State Partnership,** in agricultural research. The System's agricultural partnership with the federal government provides the basis and definition of the System's membership along with significant resources for programmatic activities.

- **A Convener for Regional Research Projects.** One fourth of the System's federal funding is set aside for Regional Research Projects. Significant effort is also devoted to regional coordination projects, many of which are jointly sponsored with extension.

- **Comprehensive in its Coverage,** of the scientific disciplines related to agriculture, when broadly defined. In addition to the biological and physical sciences, agriculture research on virtually all campuses has the capacity to conduct social and behavioral science research, and farm and business research. This comparative advantage is significant for the System, when partnering with federal research agencies, where discipline divisions are often separated as agency boundaries.

- **Linked to the International Scientific Community,** through many points-of-contact, including graduate education. Former students and post doctoral scientists now working in the international community represent a network of collaborators of considerable comparative advantage.

- **Continuous in its Scientific Research Capacity,** from fundamental and applied**.** Research supports our future knowledge needs. The continuum of applied and fundamental research in the System's portfolio helps to maintain the System's capacity to respond to current and future needs.

- **Resource leveraged.** By virtue of System membership, and as a result of a willingness to work in collaboration with other institutions, the research outputs and derived public benefits from the System's activities are significantly leveraged.

- **Committed to Listening to our Customers.** Through direct engagements and through extension feedback mechanisms the SAES System remains in touch with the broad constituency it serves.

- **Fundamental to Graduate Education.** Research supported by the SAES System provides the base research program that supports graduate education in the agricultural and social sciences. These graduate programs provide a well trained workforce to sustain a productive and innovative food and fiber system for the future.

- **Well supported, politically.** The SAES System receives strong support from both the U.S. agricultural community, and from the general public. This decades-long support reflects the tremendous social, economic and environmental benefits that are derived from investing public funds in agricultural research.

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Strategic Targets

A set of 8 Strategic Targets, with 32 associated Action Items, will be pursued by the SAES system over the next five years to address the Federal-State Partnership's five strategic goals. These Strategic Targets and Action Items are:

- **Strategic Target 1.** Place greater emphasis on identifying and serving the needs of stakeholders and clientele.

  Action Item: Expand consultation, participatory planning and stakeholder involvement in program implementation.

  Action Item: Emphasize the development of science-based information, technologies, and knowledge through a diverse portfolio of priority research activities.

  Action Item: Provide knowledge and services equitably for all citizens, including the historically underserved and small-scale farming enterprises, for a broad base of service and appreciation.

- **Strategic Target 2.** Improve the effectiveness of agricultural research management.

Action Item: Share research management approaches and successful leadership experiences through professional development programs, seminars, workshops, and in other ways.

Action Item: Develop improved performance and accountability measures to better assure scientific quality and research relevance.

Action Item: Develop, maintain, and share methods for documenting the impacts of research.

Action Item: Maintain an inventory of SAES System's capacity (human, fiscal, and physical resources) to better plan and direct activities for solving relevant problems.

Action Item: Verify the quality of scientific research, utilizing peer review where appropriate, to ensure that research investments are effectively allocated.

- **Strategic Target 3.** Expand the research capability of the SAES's to respond to stakeholder needs.

  Action Item: Involve faculty-colleagues from non-traditional disciplines in the conduct of SAES research.

  Action Item: Maintain and expand a diversified portfolio of funding sources for research, including the development of non-traditional sources of funding.

- **Strategic Target 4.** Expand and reinvigorate our strategic partnerships.

  Action Item: Strengthen our partnership with CSREES.

  Action Item: Jointly plan and conduct research activities with traditional (e.g., ARS, ERS, FS) and new partners (e.g., private labs, research-based companies, commodity groups, non-governmental organizations).

  Action Item: Develop stronger collaborative relationships with additional federal agencies (e.g., NASA, EPA).

  Action Item: Develop and enhance appropriate collaborative arrangements with the private sector.

  Action Item: Develop and enhance partnerships among states.

  Action Item: Provide leadership for expanded international partnerships.

- **Strategic Target 5.** Foster improved integration of research, extension and academic programs.

  Action Item: Expand cross-functional collaborations within and among institutions.

  Action Item: Encourage more participation by extension specialists in Regional Research Projects and in Regional Coordinating Committees.

- **Strategic Target 6.** Be more accountable to stakeholders.

  Action Item: Improve the effectiveness of our communications with stakeholders, including legislators and the public.

  Action Item: Directly contribute to the reporting requirements of the Government Performance and Results Act (GPRA).

  Action Item: Support the SAES System's growing commitments to Image Enhancement, jointly with the Extension Committee on Organization and Policy (ECOP).

- **Strategic Target 7.** Couple the processes of national strategic planning with federal budget development and advocacy.

Action Item: Create a process for consensus building on a limited set of strategically important national priorities.

Action Item: Provide a process for identifying national initiatives, suitable for concerted promotion.

Action Item: Join with ECOP to plan and promote common priorities and initiatives.

Action Item: Work with CSREES in the "outyears" to identify joint budget priorities.

Action Item: Identify areas of emphasis to be targeted with additional formula appropriations from congress

Action Item: Work with other federal agencies in support of their budget requests, when those requests are congruent with the priorities of the SAES System.

- **Strategic Target 8.** Organize the national research portfolio into a set of discrete programs.

  Action Item: Give the SAES System's diversity of disciplines a voice in the creation of a consensus ordering the research portfolio's programs.

  Action Item: Reorganize the Experiment Station Committee on Organization and Policy's (ESCOP) Technical Committees for greater cost efficiency and effectiveness.

  Action Item: Partner with the professional society activities (e.g., FAIR 2002, CROPS 99) for planning national program activities.

  Action Item: Liaison with commodity groups to establish agreed programmatic priorities, for mutual support.

  Action Item: Charge the identified program areas with responsibility for: monitoring and projecting needed capacity; planning research activities; and reporting accomplishments.

Implementation of This Plan

Implementation of this plan of this plan will be through: individual SAES activities; jointly sponsored regional research projects; multi-institutional collaborations; and ESCOP-sanctioned activities. Much of this plan's implementation will be done in collaboration with our traditional and new partners. Implementation through ESCOP will be done as ESCOP-sanctioned committees and task forces, working in concert with federal agencies, other "COPs", and the professional societies. Cost efficiencies and project effectiveness criteria will be applied to all ESCOP-sanctioned activities, on a continuing basis. Advisory oversight for all activities will be provided by CARET, industry, and commodity group representatives.

Organization of the national research portfolio into a set of national programs will be done under ESCOP's leadership with attention to maintaining a balance between desired representation and the costs of participation. Each program will be charged with responsibility for:

- maintaining an inventory of programmatic capacities;
- planning for program activities; and
- for reporting program accomplishments.

This configuration will allow a linking of:

- Program planning activities to resource needs;
- Resource needs to budget requirements (and thus to SAES advocacy efforts); and,
- Program investments to research outcomes and benefits (for GPRA reporting and Image Enhancement).

Expected Benefits of This Plan

The SAES System views itself as an entity greater than the sum of its parts. The SAES System is seeking even greater enhanced performance as a "System." This outcome will be realized primarily as:

- Improved scientific quality of our research, through greater employment of peer review methods;
- Enhanced responsiveness to our stakeholders, through better processes for listening to our stakeholders;
- More stakeholder relevance in our research activities, by improved priority setting methods;

- Better integration of our research with extension and teaching, through more joint planning and implementation;
- Better transfer of new technologies to our intended U.S. users, thorough stronger research support for extension;
- A stronger partnership with the federal government, through expanded communication and support;
- More accountability, through GPRA reporting and the ESCOP/ECOP Image Enhancement activities; and
- Greater public confidence in the SAES System, through better communication with the public.

Evaluation of the Success of This Plan

The aggregate outcomes, benefits and impacts of the SAES System in the next five years will be documented through the reporting processes of GPRA. Milestones and indicators for this purpose will be selected in partnership with CSREES. Annual GPRA reports will be made public through multiple channels. This information will be supplemented with professionally crafted 'Image Enhancement' documents, suitable for communicating the SAES System's successes. These documents, along with customer satisfaction surveys and assessments of trends in various sources of funding for the SAES System, will be the additional measures used to evaluate the success of this strategic plan.

Other Action Steps

- Work jointly with partners to find ways of being flexible and adaptive in response to change.
- Work with our functional partners on the development of a longer-term strategic plan.
- Develop an advocacy plan for the SAES System.
- Participate in the national and regional plan for communicating with the public.
- Base our future SAES System annual budget requests on programmatically-based priorities and plans.

Footnotes:

1. The membership of the SAES System includes the State Agricultural Experiment Stations affiliated with the 1862 Land-Grant Universities and the Connecticut Agricultural Experiment Station at New Haven; and the agricultural research programs at the 1890 Land-Grant Universities and Tuskegee University.

2. The process used for developing the consensus positions represented in this document started with a series of national and regional listening sessions supplemented by other information resources. From these sources the ESCOP Subcommittee on Strategic Planning, which has representation from SAESs, extension, teaching, and USDA/CSREES (i.e., the federal partner-agency), identified a set of issues which were coalesced into a draft strategic plan. Subsequent cycles of review and revision have contributed to a national consensus on these proposed strategies.

3. Agriculture, as used herein, is defined broadly to include all aspects of food, fiber, ornamental, and forest production, processing and consumption. The term agriculture is also used herein to relate to broad public responsibilities for preserving natural resources and protecting the environment, and serving the needs of all of the customers of agriculture; as individuals, families, and communities.

4. The five goals are: An agricultural system that is highly competitive in the global economy; A safe and secure food and fiber system; A healthy, well nourished population; An agricultural system which enhances natural resources and the environment; and Enhanced economic opportunity and quality of life for Americans.

5. The membership of the SAES System includes the State Agricultural Experiment Stations affiliated with the 1862 Land-Grant Universities and the Connecticut Agricultural Experiment Station at New Haven; and the agricultural research programs at the 1890 Land-Grant Universities and Tuskegee University.

6. See Issues to Action: A Plan for Action on Agricultural and Natural Resources for the Land-Grant Universities. The Board on Agriculture, National Association of State Universities and Land-Grant Colleges, 1996.

7. Actually, the REE plan calls for a sixth outcome that relates entirely to human capacity development within the REE mission area, and thus it is not directly relevant to this research planning exercise.

8. For an analysis of these relationships see W. E. Huffman and R.E. Just, "Funding, Structure, and Management of Public Agricultural Research in the United States," *Journal of Agricultural Economics*, November 1994.

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This strategic plan[2] represents a comprehensive roadmap of national strategies for the agricultural[3] research activities conducted by the State Agricultural Experiment Station (SAES) System, and in partnership with others. This document also communicates critical milestones on the way towards intended accomplishments for the System's users (i.e., customers, consumers, stakeholders, agricultural leaders, and decision makers), as we look to new ways to enhance System performance and report on research impacts. Our plan is a dynamic, working document. Periodic up dates will be issued as needed.

Through this plan the SAES System renews its commitments to the Land-Grant University's fundamental paradigm that integrates teaching, research and extension for maximum public benefit. This renewal will allow the System to provide more concerted efforts when responding to publicly relevant issues, which have been voiced in successive citizen engagement sessions.

These citizen-identified issues have been transformed through a process of strategic planning into a set of national agricultural research programs and initiatives. Linking these Systemwide programs and initiatives to the extension System's base programs and initiatives, and to the national strategic plan for higher education, will better assure delivery of customer relevant research results for immediate and future public needs.

The SAES System has comparative advantages that allow it to provide public-relevant knowledge and information. Paramount among these is our long-term collaborations within and among Land-Grant institutions, and our partnership with the federal government through the USDA's Cooperative State Research, Education, and Extension Service (CSREES). This strategic plan builds on these relationships, and extends the partnership strategy in new ways, to serve the public better.

The System also plans to more broadly define its mission to address better publicly relevant issues, and to provide better research support for the extension and teaching missions of our paradigm partners. Additionally, the SAES System will use the five goals[4] jointly derived with our federal partners as a framework for planning national research activities, and for reporting research results through mechanisms such as those required by the Government Performance and Results Act of 1993.

The SAES System views itself as an entity greater than the sum of its parts, participating in coordinated project planning and research collaborations within the SAES network. The SAES System is seeking even greater enhanced performance as a "System." This outcome will be realized primarily as:

- Improved scientific quality of our research;
- Enhanced responsiveness to our stakeholders;
- More stakeholder relevance in our research activities;
- Better integration of our research with extension and teaching;
- Better transfer of new technologies to our intended U.S. users;
- A stronger partnership with the federal government;
- More accountability; and
- Greater public confidence in the SAES System.

To assure the quality of the System's research, its responsiveness, and its relevance to stakeholders, several significant changes are being implemented. The SAES System is:

- Expanding its capacity to engage our customers, to better respond to their needs;
- Reorganizing its national research portfolio, to better address our customers' needs;

- Expanding its use of peer review, to enhance evaluations of scientific merit;
- Introducing surveys to evaluate customer satisfaction;
- Maintaining an inventory of national research capacity, to better manage its strengths;
- Refocussing its research, to better obtain societal, economic, and environmental benefits;
- Building new coalitions, to more fully accomplish its research objectives; and
- More vigorously communicating the System's accomplishments and successes.

This plan offers the opportunity to pass to future generations:

- A more environmentally friendly and sustainable U.S. agriculture;
- Increased satisfaction with the harvested and processed products of U.S. agriculture;
- More nutritious and safer foods for healthier Americans;
- Improved quality of life for all American citizens; and
- Stronger families and communities.

At the same time:

- U.S. farmers, ranchers, and rural communities will benefit from increased productivity and profitability;
- The commerce of U.S. agriculture will become more diversified;
- Consumers will have a safer and more nutritious food supply;
- The managers of our nation's natural resources will be more informed;
- Global marketing of U.S. agricultural products will expand; and
- American jobs will be created.

The SAES System recognizes that the future holds many unknowns, and significant resource constraints may limit our achievements. Given the public's expectations for solving the important agricultural, environmental and social issues identified through our listening sessions, the System's agenda is clear. And, given past high rates of return for agricultural research expenditures, these proposed research investments are well justified.

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DRAFT 11/1/97

A Medium Term (1998-2002) Strategic Plan for the State Agricultural Experiment Station System

Vision Statement

The SAES System will be viewed by its primary stakeholders, and by the general public, as the premier providers of science-based agricultural research knowledge that is relevant, useful, and timely for addressing current and future problems, and for creating opportunities to further enhance public well being.

Mission Statement

The SAES System, in partnership with the U.S. Department of Agriculture, usinga decentralized network of participants, provides the relevant and appropriate scientific knowledge and the research capacity needed for: an economically viable and environmentally sustainable food, forest, ornamental and fiber production system; a safe, dependable, nutritious, diverse, and affordable food supply; the preservation and protection of natural resources; all leading to a satisfactory quality of life for all citizens and their communities. The SAES System will work cooperatively with academic programs, the extension system, federal and state agencies, and industry to meet the broader goals of its clientele. We will do this through the development of new knowledge in the biological, physical and social sciences.

Background

Strategic planning within the State Agricultural Experiment Station[5] (SAES) System has, for nearly two decades, been primarily focused on describing a national "strategic agenda" of ranked agricultural research priorities. This process has recently given way to a more integrated approach that has brought together the Land-Grant University functions (i.e., teaching, extension and research) to identify common issues leading to action. This "Issues to Action"[6] process involved a series of regional listening sessions followed by a synthesis of issues leading to a plan of action. The entire activity was premised on determined efforts to streamline collaborations among the Land-Grant Universities, and across functions. This most recent cross functional planning effort has set the stage for a new approach to strategic planning for the SAES System.

The SAES System is interested in receiving comments, endorsements, recommendations, criticisms, and points-of-concern in response to this plan as the SAES Directors organize the System's programs and allocate their resources for the next five years.

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The Purposes of Agricultural Research

The Federal Agriculture Improvement and Reform Act of 1996 (a.k.a. the Farm Bill) lists the following purposes for agricultural research.

"The purposes of federally supported agricultural research, extension and education are to-

"(1) enhance the competitiveness of the United States agriculture and food industry in an increasingly competitive world environment;

"(2) increase the long-term productivity of the United States agriculture and industry while maintaining and enhancing the natural resource base on which rural America and the United States agricultural economy depend;

"(3) develop new uses and new products for agricultural commodities, such as alternative fuels, and develop new crops;

"(4) support agricultural research and extension to promote economic opportunity in rural communities and to meet the increasing demand for information and technology transfer throughout the United States agriculture industry;

"(5) improve risk management in the United States agriculture industry;

"(6) improve the safe production and processing of, and adding value to, United States food and fiber resources using methods that maintain the balance between yield and environmental soundness;

"(7) support higher education in agriculture to give the next generation of Americans the knowledge, technology, and applications necessary to enhance the competitiveness of United States agriculture; and

"(8) maintain an adequate, nutritious, and safe supply of food to meet human nutritional needs and requirements."

The SAES System has adopted these purposes as a foundation for this strategic plan.

In addition, the SAES System, in partnership with the USDA's Research, Education, and Economics (REE) mission area and its Cooperative State Research, Education, and Extension Service (CSREES), and with substantial customer input, have identified five strategic goals[7]. These five goals provide an accurate and well-defined framework for the SAES System's strategic planning efforts, and thus the five Federal-State Partnership's goals have been adopted for this planning process as well.

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Strategic Issues

In several recent national and regional listening sessions, and through continuing customer engagements, the SAES System has identified a number of customer-important needs and priorities. These have been assembled into a list of customer-identified

issues, stated as the need to:

- Assure access to technologies to provide reasonable farm and ranch productivity and profitability;
- Deliver technologies that are integrated, and proven on a realistic scale;
- Develop production methods that are sustainable, and environmentally friendly;
- Resolve public and scientific concerns for agriculture's over-reliance on pesticides and fertilizers;
- Address broad-based public desire for a pollution-free environment;
- Support informed management of our natural resources; including soils, water, air, and biota;
- Assure a supply of nutritious and safe foods for all Americans;
- Answer growing consumer demands for a reliable, secure, accessible and affordable food and fiber supply;
- Give research emphasis to technologies that create jobs, and distribute benefits equitably;
- Assure that U.S. agriculture will remain internationally competitive in the emerging global market place;
- Apply technologies for more precise agricultural production methods;
- Develop technologies that add value to harvested products;
- Find ways to promote development and enhance the well being of all citizens, urban and rural; and
- Meet citizen expectations for help in individual, family, and community development.

The SAES System accepts the challenge to address these customer-identified issues, and it redirects its resources to address these compelling issues.

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Assumptions

This strategic plan rests on a set of fundamental external and internal assumptions. The external assumptions are:

- Consumer demand for safe, high quality, accessible, and low cost foods and other biological products with a diversity of selections will continue to expand, both domestically and globally.
- Pressure for the uses of land other than agriculture will continue to increase.
- Citizen concerns for environmental protection will intensify.
- Some environmental problems will continue to have links to agricultural practices.
- Science, including agricultural research, will operationally continue to become more global.
- Concern for the continued vitality of our rural infrastructure.

The internal assumptions are:

- Federal base funding (a.k.a. Hatch Act funding) will continue to support SAES System activities, and to define the System's membership.
- The leveraging of federal base funds from other sources will continue to amplify our resources.
- The Federal-State Partnership will be expanded to additional federal agencies.
- New types of partnerships will be organized with the private sector.
- Stronger collaborations will be formed with the LGU extension and teaching functions.
- New and better methods will be created for listening to our customers, stakeholders, agricultural leaders, decision makers, and supporters.

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Guiding Principles

The SAES System has a heritage of providing relevant agricultural research for meeting customer needs, and solving real world problems. It is also proud of its responsiveness to agricultural production crises and human emergencies. These characteristics are the hallmarks of the LGUs, and can be traced to their institutional paradigm that integrates teaching, research, and extension. And, it is their public service philosophy that provides the characteristic distinguishing LGUs from other types of research institutions.

Analyses of rates of return on agricultural research investments typically exceed 30% to 50 % annual returns on investments. Comparisons with other forms of scientific research are not available, as similar studies have apparently not been conducted.

However, few, if any, areas of research pay dividends that approach those of agriculture. The unique coupling of basic and applied research activities at the SAESs accounts for these very high rates of return.

Considerable experience has been derived from developing the world-renowned Land-Grant Universities, including the SAES System. This experience has led to a number of guiding principles for developing a national agricultural research strategic plan for the SAES System. These principles are:

- A distributed, pluralistic system is essential for successful agricultural research. Centralized facilities for agricultural research are less effective than distributed systems because agricultural constraints and research opportunities are frequently site specific.
- A decentralized system for the management of scientific research is essential for intellectual creativity.
- The Federal-State Partnership in agricultural research has evolved as a special and valuable working relationship. This partnership is attributed to federal base funding provided to the SAES System. It allows the federal partner to participate in decision making at the regional, state, and local levels, while leveraging their investments with non-federal funds.
- The SAES System works in a collaborative mode because of a shared research agenda and because of the incentives of federal base funding, which is allocated to each SAES by formula. The member institutions of the SAES System work together on a common mission. Although each Station is autonomous and independent, each willingly participates in this national System.
- A half-century of conducting highly successful Regional Research Projects on a broad agricultural research agenda provides the SAES System with the experience, and the mechanism, for tackling some of agriculture's most difficult social, economic and environmental problems. These tougher problems are frequently not limited by a state's political boundaries. Regional Research affords the SAES System a great strategic advantage for solving these types of problems.
- The Land-Grant University's paradigm, which integrates teaching, research, and extension, is globally unique, well respected, and recognized worldwide as an institutional paradigm worthy of emulation. Complementaries among research, extension and teaching provides for greater institutional, scientific, public, societal, environmental, and economic benefits.
- By carefully configuring national and regional competitive grants, commodity support, industry grants, and special research grants, along with federal base and state funding, SAES Directors are able to provide for the immediate needs of customers while investing in research for agriculture's future[9].
- The enduring impact of past SAES allocation decisions, and the need to provide stable support for research projects restrict the speed and extent to which funds can be redirected.

- The ability of individual Experiment Stations to plan scientific research for broad national goals is limited. Individually, Stations cannot and should not be expected to provide precise plans because experimentation is inherently unpredictable, and the scope of the work frequently exceeds the capacity of individual institutions. Rather, the collective actions of the SAES System need to be planned and evaluated for their collective accomplishments and the returned benefits.

Systemwide strategic planning must consider these guiding principles when proposing new arrangements for organizing agricultural research. Decision-makers today expect more responses from public programs, and better measures of impacts and benefits from public research investments. This expectation requires more informed management decisions on future outlays by SAES Directors. Directors in turn, must give greater attention to planning and accountability, while preserving the characteristics of the System that have contributed to its success.

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Environmental Assessments

External Assessment - Significant external changes to science are affecting all sectors of research, including agricultural research. Some of the critically important external factors are:

- The Global Marketplace. In the post-Cold War era new incentives for science investments have emerged, with considerable emphasis on global market competitiveness. Today, many nations are acknowledging the need to invest in science in order to remain (or become) competitive in the global marketplace.
- Evolving stakeholder expectations. Commodity representatives, consumer advocacy associations, environmental interest groups, non-governmental organizations, industry leaders, and elected representatives are today more directly expressing their needs and priorities to SAES directors and scientists. In the aggregate, expectations vastly exceed the System's available research capacity. Thus, informed management decisions are needed to best allocate available resources.
- Extension's agenda shift. The SAES's national agricultural research agenda may need to include some research topics that have been previously excluded. This need is most evident in the SAES relationship with extension, wherein several major

extension activities are not now well supported by research activities (e.g., Youth at Risk, Managing Change in Agriculture).

- Structural Changes in Agriculture. The merging of formerly separate industries of agriculture (e.g., seed and chemicals) and vertical integration (e.g., poultry and swine) are significant factors causing change in American agriculture.
- Expansion of the Clientele-base for LGUs. Changing expectations of public institutions and the United States' demographic transformation from the predominant rural/farming economy of six decades ago to today's mixed economy has shifted the responsibilities of the Land-Grant Universities. This change has caused a constant tension between providing research for the needs of traditional production agriculture, and the added research responsibilities to address natural resource management, environmental topics, and consumer and family issues.
- Calls for Accountability. Closer scrutiny of public sector investments in agricultural research is leading to calls from elected representatives for greater program accountability and more documented justification for budget requests. Federally, this call is manifested in the Government Performance and Results Act (GPRA) which requires federal agencies to use strategic planning-based impact assessments as a process for deciding future resource allocations. This requirement is directly impacting the management decisions of the Federal-State Partnership in agricultural research.
- Concerns for the food and fiber supply. The long term sustainability of the nation's food and fiber supply is a standing concern. These concerns are linked as well to concerns for global population issues, and the need to respond responsibly to the growing wordwide demands for agricultural products. These demands are projected to increase in the coming decades.
- A multi-modal agriculture. Simplistic depictions of the structure of U.S. agriculture fail to show the complex nature of the various types of U.S. farming and ranching. Moreover, the diversity of agricultural enterprises is expanding, further complicating SAES System's strategies for meeting public expectations.
- The focus on sustainability. A major paradigm shift to sustainabile agriculture has occurred in the past two decades. This shift in emphasis toward sustainability is noteworthy, and represents a significant challenge for the agricultural research community that cannot be ignored.
- Private sector research. A strong U.S. private sector agricultural research enterprise has emerged, which by some estimates now accounts for 60% of the annual national investment in agricultural research. This emergence is causing a shift in the demarcation of research responsibilities between the public and the private sectors. Much of this change is driven by reinterpretations of intellectual property rights laws that were intended to encourage private sector investments in areas formerly the responsibility of the public sector.
- Public-Private Sector Partnerships. Partnerships between the public and private sectors are evolving to higher levels of collaboration, especially in the "pre-technology sciences" (*sensu* Huffman and Evenson). University partnerships with industry can also effectively transmit new technologies to the market place and are complimentary to extension when properly organized.
- Declining farm representation. Agricultural technology successes in the past half century have contributed to a decline in the number of people directly engaged in farming. Related to this trend is the consequent reduction in the proportion of elected representatives who are farmers, or even know about farming. This outcome complicates the process of communicating agricultural research needs, opportunities, and achievements to our elected representatives.
- Policy decisions. The consequences of federal, state, and local agricultural and environmental policy decisions will continue to complicate agricultural research choices for program managers.

Internal Assessment - Significant internal factors also affect agricultural research management decisions. Some of the more important factors are:

- Financial constraints. SAESs' financial constraints, mostly resulting from budget cuts in many states and static federal funding, have forced tough management decisions at many Stations. Consequently:

  - New research opportunities may not be pursued;
  - Necessary maintenance is deferred;
  - Operating budgets are reduced; and
  - Open positions are left vacant.

  One consequence of financial constraints is the System has been reluctant to engage in new initiatives, or to begin significant investments in emerging technologies, because the necessary redirection of institutional resources would be painful.

- Multiple claimants. A consequence of having multiple institutional claimants, each with an agenda, is the pressure to preserve past patterns of expenditures. Often, such groups have the political clout to enforce their demands. Redirection of programs into new initiatives or emerging technologies, in the face of ever constrained resources, has led to a state of semi-crisis in research management at some Stations.

- Public and Private Sector Responsibilities. The traditional division of responsibilities between the public and private sectors is undergoing rapid change, much of which is driven by new technologies and markets for goods and services formerly provided by public institutions. There remains, however, a strong need for public institutions to provide public goods not otherwise provided by the private sector. Sorting these responsibilities is a major challenge for research planners.[10]
- Multi-disciplinary research. Increased demand and expanded opportunity for multi-disciplinary research teams have caused a shift in the expectations for collaboration and research management support. This represents a major challenge to the SAES System.
- Systems Science approach to research problems. There is an increasing expectation from research faculty for management's support of Systems Science research. Systems Science is a more holistic approach to the inter-relationships of component parts, and differs significantly from the more traditional reductionist approaches to research questions.
- Emerging technologies. New technologies are emerging to offer exciting opportunities for agricultural research. Among these topics are: plant and animal genomic mapping; genetic engineering; precision agriculture; value-added technologies for harvested products; and applications of computing and electronic communications in agriculture. These topics reflect the high cost of many contemporary agricultural research activities. Currently, the SAES System is under invested in these and many other topic areas, *vis-a-vis* needed initiatives and emerging technologies.
- Paradigm stress. The current funding stress faced by LGUs is threatening the fundamental paradigm of the institution, and its SAES component[11]. Institutional downsizing has created programmatic gaps on many campuses that cannot be easily filled by reassignments or reorganization. System capacity is threatened by these changes. Survival of many LGU Colleges of Agriculture and their SAES is a serious concern.
- Intellectual property rights. The management of intellectual property rights and the associated earned royalties has, on many campuses, become a serious concern. How these resources can better contribute to the mission of the institution and the collective SAES System is in need of attention.
- Institutional changes. The evolution of Land Grant Universities is bringing significant changes to the structure, organization and focus of research and education. This shifting pattern of institutional make-ups needs to be recognized in any national strategic planning effort.

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Comparative Advantages

The SAES System has important comparative advantages that contribute to its strength and uniqueness.

The SAES System is:

- Nationally distributed with multiple sites within each state. This distributed System offers a network of research stations which provide diverse environments and conditions for research. Having a System of research stations also permits the early detection and monitoring of agricultural problems and environmental conditions in ways that support the collective agricultural research network.
- A participant in the tripartite mission of the Land-Grant University. The synergism derived from the institutional integration of teaching, research, and extension has substantial and well recognized social, environmental, and economic benefits.
- A component of the Federal-State Partnership in agricultural research. The System's agricultural partnership with the federal government provides the basis and definition of the System's membership and significant resources for programmatic activities.
- A convener for regionally organized research projects. One fourth of the System's federal funding is set aside for Regional Research Projects. Significant effort is also devoted to regional coordination projects, many of which are jointly sponsored with extension.
- Comprehensive in its coverage of the scientific disciplines related to agriculture, when broadly defined. In addition to the biological and physical sciences, agriculture research on virtually all campuses has the capacity to conduct social and behavioral science research, and farm and business research. This comparative advantage is significant for the System, when partnering with federal research agencies, where discipline divisions are often separated as agency boundaries.
- Tied to the international scientific community through many points-of-contact, including graduate education. Former students and post doctoral scientists now working in the international community represent a network of collaborators of considerable comparative advantage.
- Continuous in its fundamental and applied scientific research capacity. Fundamental research supports our future knowledge needs, and the development of graduate students (a direct by-product of investing in the agricultural research enterprise). The continuum of applied and fundamental research in the System's portfolio helps to maintain the System's capacity to respond to current and future needs.

- Resource leveraged. By virtue of System membership, and as a result of a willingness to work in collaboration with other institutions, the research outputs and derived public benefits from the System's activities are significantly leveraged.
- Capable of listening to its customers. Through direct engagements and through extension feedback mechanisms the SAES System remains in touch with the broad constituency it serves.
- Well supported politically. The SAES System receives strong support from both the U.S. agricultural community, and from the general public. This decades-long support reflects the tremendous social, economic and environmental benefits that are derived from investing public funds in agricultural research.

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Strategies and Priorities

Management Strategies

To address the Federal-State Partnership's five strategic goals a number of key management strategies will be pursued by the SAES System.

The SAES System will:

- Expand our capacity to engage our customers by studying existing state programs that are recognized as successful, and then developing customer engagement guidelines.
- Reorient research management and resource allocations to focus more on research outcomes and impacts, and on social, economic, and environmental benefits.
- Redefine and reinvigorate the Federal-State Partnership to include other federal agencies both within and beyond the USDA.
- Develop new models to strengthen the teaching, research, and extension paradigm of the LGU to provide enhanced, cross-functional, collaborative programs.
- Organize our national agricultural research portfolio into a set of National Agricultural Research Programs (see later section) to better address the Federal-State Partnership's strategic goals. This strategy will provide:

    - Enhanced national planning for our priority research activities;
    - Better measurement of our research progress;
    - More precise assessment of our research achievements; and,
    - Better documentation of our contributions, measured as social, economic and environmental benefits.

- Inventory the System's research capacity, as a defined by the National Agricultural Research Programs.
- Integrate the System's activities with higher education's programs and the extension's Base Programs[12], whenever feasible and beneficial.
- Identify and implement a series of evolving National Agricultural Research Initiatives to complement better the National Agricultural Research Programs, and to strengthen our commitments to our customers. National Agricultural Research Initiatives may be linked to extension initiatives and/or to academic programs, when mutually beneficial[13].
- Build on the advantages of the Regional Research authority to create new collaborations in line with the Federal-State Partnership's goals.
- Continue with our historical funding strategies that depend on multiple sources of funding to support a diverse portfolio of research activities through a recommitment to our traditional federal funding authorities (i.e., Hatch Act, competitive grants, special research grants), all of which are needed to support the rich and diverse portfolio of research activities that are represented in this strategic plan.
- Seek new federal authorities to provide the System with a greater diversity of types of funding for more effectively accomplishing this research agenda. We are specifically seeking statutory authority for contract research, and several different types of targeted research grants.
- Supplement federal and state resources with commodity, private, foundation, and international sponsors interested in aspects or components of this strategic plan.
- Seek to expand our funding base beyond traditional sources by exploring new and novel mechanisms, such as: new national and international commodity check-offs; entitlement program set-asides; new partnerships and coalitions with the private sector; and strategic alliances with non-governmental agencies and non-Land-Grant institutions, when those linkages will help us achieve our objectives.
- Recommit to using peer review for judging scientific merit, and committing to using customer reviews of research program relevance, for all investigations sponsored and conducted by the System. This includes both *a priori* and *a posteriori* evaluations.

- More vigorously communicate the System's successes through an expanded regional and national effort in image enhancement.
- Apply our global scientific leadership toward the creation of international partnerships to help us accomplish our research agenda and to maximize the efficiency of returns on investments in agricultural research.
- Share successful research management approaches and programmatic successes through leadership development programs and nationally organized workshops for research managers.

Management Priorities

In order to better assure successful research outcomes, we are committed to the following management priorities. We will give:

- Greater emphasis to the needs of stakeholders and customers, through expanded consultations, participatory planning, and involvement in program implementation;
- More commitment to effective agricultural research management through performance and accountability measures assuring science quality and research relevance;
- More emphasis to the efficient use of resources through enhanced regional and national planning, and the orderly execution of our research activities;
- A redefinition to the SAES's boundaries, to extend our research coverage beyond colleges of agriculture;
- Attention to the new agenda represented by the Federal-State Partnership's strategic goals; and,
- More attention to the integration of teaching, research and extension through expanded, cross-functional collaborations.

To strengthen the System, and build on our past successes, there will be a need to:

- Maintain an inventory of the SAES System's capacity to solve relevant problems, to ensure that the System can fulfill current and future expectations, and to establish thresholds against which progress can be measured;
- Match the research capacity of the System to the goals of the Federal-State Partnership;
- Assure adequate Federal incentives to institutions, to ensure their participation in the national SAES System;
- Be congruent with the federal partners for GPRA planning and reporting;
- Provide science-based information and knowledge from a diverse portfolio of research activities;
- Verify, *a priori* and *a posteriori*, the quality of scientific research undertaken to assure that research investments will be, or have been, efficiently and appropriately allocated; and
- Provide knowledge and services equitably for broad-based citizen appreciation and support.

Research Strategies

Strategies for organizing national agricultural research programs will give priority attention to:

- Obtaining knowledge that is sustainable and environmentally friendly, and that allows for the reduction, management, or avoidance of risk;
- Information-intensive systems that place American farmers and ranchers in a more globally competitive position;
- A Systems Science approach to problem resolution, when appropriate, and using multidisciplinary research teams, when beneficial;
- Developing technologies that lower input costs, add value, and/or improve profitability;
- Approaches that align with the nutritional and health needs of the consumer;
- Developing knowledge that increases access to, and acceptance of, U.S. agricultural products;
- Research that provides the alternatives available to producers, processors and consumers; and
- Research that maximizes individual, family and community capacities.

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National Research Programs

Organization:

The national SAES research portfolio will be organized into a limited number of program areas. This strategy was selected over other organizational schemes (e.g., issues, themes) as being most consistent with the natural order of research and most compatible with the current organization of our major research partner (ARS, with 25 research programs) and with extension (ECOP, with 7 base programs).

Rationale:

There are currently 33,000 Current Research Information System (CRIS) projects. The intent of identifying a small set of national research programs is to:

- Allow better assessments of current research capacities;
- Improve our planning in the longer term, and;
- Enhance the evaluation of research outcomes and impacts.

Criteria:

Several attempts to strategically define a set of National Research Programs (NRPs) has led to the identification of the following criteria:

- The number of NRPs must be limited, yet sufficiently large to define coherent areas of research;
- Areas of science, when designated as a program, must be reasonably consistent with our major collaborative partners;
- The cost of supporting NRPs must be contained, and no assessments or off-the-top funds should be contemplated;
- Operational procedures must be compatible with existing activities;
- The products and services to be derived from NRPs must have sustained value to the SAES System; and
- Compatibility and consistency with CRIS is essential, to allow analyses of resource outlays by programs, most likely by Research Problem Areas (RPAs).

Management:

Two options for forming a set of NRPs are under consideration.

Option 1. Use the Regional Research Fund's authority to create a strategically planned set of NRPs, using the Project Outline request and review process of the regional associations of SAES Directors. This could be done in partnership with extension and ARS, and possible with academic programs.

Option 2. Create a set of strategically selected national programs under the auspices of ESCOP, formed as a set of subcommittees. An existing example would be the Pest Management Strategies Subcommittee.

In either case, Terms of Reference (TOR) would be given to each NRP. The TOR would request an inventory of programmatic capacity, the development of a program plan based on clearly identified priorities that address one or more of the partnership's goals (with stated objectives), and the development of an accountability plan for annually reporting on the impacts and benefits derived from investments in the program. The conceptual model for this set of activities is the plant breeding capacity inventory and the strategic plans recently completed under the leadership of Ken Frey of Iowa State University.

Support mechanisms will need to be crafted to facilitate each program's activities. Additionally, program evaluations will need to periodically assure program performance and direction.

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National Initiatives

In addition to forming a set of National Research Programs, the SAES System will coordinate a limited number of National Initiatives. Currently, ECOP's Strategic Planning Council supports a portfolio of national extension initiatives. Although some extension initiatives also receive budget development attention, this is not the primary purpose of creating an extension initiative, which is more to focus programmatic attention into areas of needed development.

Borrowing on this idea, the SAES System will sponsor, either jointly with other partners or independently, a limited set of National Initiatives, each with a limited time horizon, and each with the specific purpose of developing an area through focussed attention.

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Implementation

The process that will be used for implementing the decisions represented in this Strategic Plan will be primarily through Subcommittees of ESCOP. This may require revision of some Subcommittee's charges, or the creation of some new Subcommittees. These decisions are not yet made, but they will occur through a consensus-building process moved by the leadership of ESCOP. Some anticipated future implementing activities are:

- Define an optimal set of National Research Programs, in partnership with ARS and ECOP;
- Identify a set of National Initiatives, in partnership with extension and others;
- Work jointly with extension's leadership on a futuring project (with a 20 year horizon);
- Examine options for enhancing the quality of research performed, through the expanded use of peer review;
- Study methods for the measurement of customer satisfaction, through survey instruments;
- Develop a marketing plan for the the SAES System, *vis-a-vis* the ESS Strategic Plan;
- Develop an advocacy plan for the SAES System, in partnership with CARET and AESOP Enterprises, Ltd.;
- Develop a national and regional image enhancement plan for the SAES System; and
- Provide an annual strategic assessment of out-year resource needs, in partnership with the ESCOP Budget Development Subcommittee, with the intention of linking ESS's Strategic Planning to Budget Development.

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Communication

To communicate the decisions represented in this document a set of communication activities will be undertaken by the ESCOP Strategic Planning Subcommittee. The Subcommittee will, once the Strategic plan has been adopted by the ESS:

- Place the ESS System's Strategic Plan on ESCOP's WWW home page for comments and criticism;
- Prepare a pocket version for use by the SAES System's advocates;
- Share the contents of the plan with our functional and research partners; and
- Brief members of Congress and their staff on the plan, perhaps as a series of seminars on "the hill".

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Time Table

The identification of a small set of National Research Programs will occur in the six month interval following adoption of this strategic plan by ESS. Simultaneously, a set of proposed National Initiatives will be developed jointly with the SAES System's partners. All of these considerations will be reported to the leadership of ESCOP, for their consideration and sharing with the broad membership of the SAES System.

Beginning in early 1998 the Subcommittee will initiate a joint futuring activity with a twenty year time horizon. This activity may need to continue for up to three years.

A task force of the Strategic Planning Subcommittee will be asked to assume responsibility for developing a set of options for enhancing the quality of research through the expanded use of peer review. A second task force will be asked to provide a set of recommendations for measuring customer satisfaction through survey methods. Six months will be allocated for these activities, with their activities beginning soon after the Section's adoption of the ESS Strategic Plan.

A marketing plan and an advocacy plan will be developed by the Subcommittee as a whole, once the final Strategic plan has been adopted, and agreement has been reached with our planning partners. These activities may take up to two years.

A regional and national based image enhancement plan will evolve from current activities, and may take up to one year to complete. A task force of the Subcommittee will be asked to accept this assignment.

An annual assessment of out-year resource needs will be done jointly with the ESCOP Subcommittee on Budget Development, if they accept the invitation to participate. This activity will be on-going.

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Advantages of This Plan

The SAES System's national approach to strategically organizing research activities by programs has several advantages, seen as:

- Cross functional collaborations will become more feasible than are presently possible;
- Working with other research agencies will be facilitated; and
- New linkages to partners and coalitions will foster a degree of national collaboration heretofore not common.

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Measures of Success

Progress on the completion of the Federal-State Partnership's five strategic goals will be documented annually through the federal government's GPRA reporting process, once the process and procedures are decided.

Another measure of the plan's success will be customer satisfaction surveys. Information from these surveys will help dynamically drive the SAES System's priority setting process that will, in turn, steer this national strategic plan.

Finally, programmatic success will be indicated by monitoring increases in the resources made available to the SAES System, in response to delivering these anticipated accomplishments.

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Footnotes:

1. The membership of the SAES System includes the State Agricultural Experiment Stations affiliated with the 1862 Land-Grant Universities and the Connecticut Agricultural Experiment Station at New Haven; and the agricultural research programs at the 1890 Land-Grant Universities and Tuskegee University.

2. The process used for developing the consensus positions represented in this document started with a series of national and regional listening sessions supplemented by other information resources. From these sources the ESCOP Subcommittee on Strategic Planning, which has representation from SAESs, extension, teaching, and USDA/CSREES (i.e., the federal partner-agency), identified a set of issues which were coalesced into a draft strategic plan. Subsequent cycles of review and revision have contributed to a national consensus on these proposed research strategies.

3. Agriculture, as used herein, is defined broadly to include all aspects of food, fiber and forest production, processing and consumption. The term agriculture is also used herein to relate to broad public responsibilities for preserving natural resources and protecting the environment, and serving the needs of all of the customers of agriculture; as individuals, families, and communities.

4. The five goals are: An agricultural system that is highly competitive in the global economy; A safe and secure food and fiber system; A healthy, well nourished population; An agricultural system which enhances natural resources and the environment; and Enhanced economic opportunity and quality of life for Americans.

5. The membership of the SAES System includes the State Agricultural Experiment Stations affiliated with the 1862 Land-grant Universities and the Connecticut Agricultural Experiment Station at New Haven; and the agricultural research programs at the 1890 Land-Grant Universities and Tuskegee University.

6. See Issues to Action: A Plan for Action on Agricultural and Natural Resources for the Land-Grant Universities. The Board on Agriculture, National Association of State Universities and Land-Grant Colleges, 1996.

7. Actually, the REE plan calls for a sixth outcome that relates entirely to human capacity development within the REE mission area, and thus it is not directly relevant to this research planning exercise.

8. Maintaining a diversified portfolio of agricultural research activities is essential for optimum scientific and public benefits. This is best done by blending science disciplines, institutional functions, and basic and applied investigations, as is commonly

practiced at SAES.

9. For an analysis of these relationships see W. E. Huffman and R.E. Just, "Funding, Structure, and Management of Public Agricultural Research in the United States," *Journal of Agricultural Economics*, November 1994.

10. The SAES System, as a public institution, focuses on a type of research that is called public good. Public good research activities are conducted in the public interest, and for the most part, are not subject to appropriations by private interests. Private firms will not undertake research and development if they do not forsee a captured benefit. Thus, major public needs would go unattended if the private sector was expected to conduct all agricultural research activities. The SAES System and its federal partners have a comparative advantage in public goods research, and an established record of accomplishment in this area.

11. Selling off a dairy research herd has far reaching consequences for teaching and extension. Likewise, closing a county extension office impacts on the delivery of research results. Canceling a college curriculum diminishes the future supply of "human capital" for both research and extension. None of these interrelationships are today well understood, or comprehensively managed from a systems perspective.

12. The current extension base programs are: Agriculture; Community and Resource Development; Family Development and Resource Management; 4-H and Youth; Leadership and Volunteer Development; Natural Resources and Environmental Management; and Nutrition, Diet, and Health.

13. The 1997-1998 extension national initiatives are: Managing Change in Agriculture; Children, Youth, and Families at Risk; Food Safety and Quality; Workforce Preparation; and Healthy Peolple ... Healthy Communities.

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