

Making Change Work

ACES' STRATEGIC PLAN



TM

College of Agricultural,
Consumer and
Environmental Sciences

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Version 1.0

Contents

Making Change Work: ACES' Strategic Plan.....	3
A Vision for ACES	5
ACES' Mission and Values	6
ACES' Planning Process	7
Forces of Change	9
ACES' Strategic Capabilities.....	22
ACES' Strategic Agendas	25
Agenda 1: Learning and Leadership.....	25
Agenda 2: Quality of Life and Economic Opportunity	29
Agenda 3: Food and Health.....	32
Agenda 4: Agricultural and Natural Resource Systems	35
Agenda 5: Value and Benefits for Illinois and the World.....	38
ACES' Management Strategies.....	41
Next Steps	43

● ACES' STRATEGIC PLAN

Version 1.0

Notes



College of Agricultural,
Consumer and
Environmental Sciences

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

● 2000

The University of Illinois began with a vision to provide higher education and to positively impact Illinois society as a whole. Signed into law by President Abraham Lincoln, the Morrill Act of 1862 established federal land grants intended to foster institutions focused on advancing learning and improving the lives of citizens, initially through promoting the mechanical and agricultural arts. Chartered by the Illinois General Assembly in 1867, the Illinois Industrial University embraced this mission. As the institution moved into the twentieth century, visionary leaders at the University of Illinois conceived of a comprehensive university that would make world-class contributions to scholarship and society. Comprised today of three campuses, located in Chicago, Springfield, and Urbana-Champaign, the University of Illinois embraces the land-grant mission of comprehensive higher learning, research and creative scholarship, and public outreach and service. The University of Illinois's first campus, established in the communities of Urbana and Champaign, provides the backbone and venerable tradition of the University of Illinois system.

The College of Agriculture was the first college established at the University of Illinois, in 1868. In partnership with the United States Department of Agriculture, the Hatch Act of 1887 established the system of agricultural experiment stations at land-grant universities devoted to mission-oriented research, and the Smith-Lever Act of 1914 resulted in the Cooperative Extension System. Today, the College consists of seven academic departments with three overarching program areas of teaching, research, and outreach. The Illinois Agricultural Experiment Station and University of Illinois Extension remain integral subsidiaries of the College.

In 1995 the College of Agriculture was reorganized into the College of Agricultural, Consumer and Environmental Sciences (ACES). The new name reflects the breadth of the College mission, and as a new era begins, the College possesses the unique combination of disciplines, organizational infrastructure, and relationships necessary to address complex issues and seize opportunities that cut across the traditional bounds of disciplines and mission functions. At this stage, it is important to reflect on ACES' current position, to articulate the vision and goals for the future, and to establish a process for planning how to accomplish those goals. *Making Change Work*, the College's strategic plan, is the first phase in this planning.

A Vision for ACES

The College of Agricultural, Consumer and Environmental Sciences (ACES) plays a central leadership role in the disciplines and issues related to agriculture, food, environment, consumers, and human and community interests by generating knowledge and putting it to work in relevant fields of endeavor. In the context of the University of Illinois, ACES aspires to achieve positive impacts on the lives of students, faculty and staff, stakeholders, and the public in Illinois, in the nation, and around the world. The purpose of this strategic plan, *Making Change Work*, is to establish a map, a set of directions, and some checkpoints along the road that will help determine whether ACES is realizing its aspirations. The intention is to create flexible and dynamic processes that will stimulate the College's efforts to

- *provide leadership* in the agricultural, consumer, and environmental sciences through research, education, and extension efforts;
- *become impact and outcome oriented*, meaning to gauge decisions and efforts not only on what the College accomplishes, but on what others will be able to do as a result of ACES' efforts;
- *create value* in all ACES endeavors—in other words, to provide exceptional outcomes and services for reasonable costs;
- *foster a creative environment that supports ACES faculty, staff, and students*, encouraging them to pursue opportunities and take risks;
- *provide the capacity* to carry out the essential and forward-thinking functions of ACES' mission; and

- *leverage ACES' institutional relationships*, as reflected in the breadth of the College's mission.

As ACES works to expand its reach and accomplish its mission, it is also critical that the College affirm its commitments to the University of Illinois and to the people of Illinois:

- *always deliver superior undergraduate education, providing a broad range of innovative programs in agricultural, consumer, and environmental sciences;*
- *reach the highest echelon of quality and relevance in ACES research programs and offer exceptional, cutting-edge graduate education;*
- *aggressively and continuously connect to the people of Illinois through excellent research-based educational programs and partnerships;*
- *pursue opportunities to advance economic development in the community and in the state; and*
- *strengthen management practices in order to maximize and extend the reach of ACES resources.*

Planning efforts have been guided by this vision of how ACES can best meet the needs of faculty, staff, and students; the broader university community; stakeholders; citizens across Illinois; and people around the world.

Notes

Notes

The goal of this strategic planning process has been to reinforce, not revise, ACES' core mission: To enhance the quality of life for people and communities through teaching, research, and outreach programs focused on human activity, food, fiber, and natural resource systems. Administrators of the College and its academic departments have developed a number of themes critical to achieving this mission. These themes are the basis for ACES' strategic agendas.

● Mission Themes

- *Advance learning and develop human resources for leadership, stewardship, and service to agriculture, the public, and Illinois's resource endowment*
- *Improve the quality of life and the economic opportunities for producers, consumers, families, and communities*
- *Promote a safe, nutritious, abundant, and affordable supply of food that enhances human health*
- *Give stewardship to managed and natural resource systems to sustain environmental quality and agricultural competitiveness*
- *Further the development of value-added crops, animals, food, and renewable-resource-based products for human and economic benefit*

The College of ACES values the land-grant university mission of education, research, and outreach. A commitment to this mission is woven into the fabric of all the College's activities.

● Values

- *ACES has a unique culture that is entrepreneurial, intellectually aggressive, collegial, open to new ideas, and oriented toward public and professional service.*
- *ACES assumes responsibility for leadership on the campus in offering outreach to stakeholders, creatively funding new endeavors, and providing unique educational programs.*
- *ACES creates an environment that is student-friendly and conducive to learning and intellectual growth.*
- *ACES provides relevant, high-quality, and affordable educational services that instill the qualities of leadership and self-sufficiency in continuing the learning process throughout life.*
- *ACES focuses its priorities on issues most relevant and important to food and agricultural systems as well as to communities, families, and people.*
- *ACES strives to create an inclusive community that values and respects diversity in its faculty and staff and in programs reflecting societal needs.*
- *ACES is committed to integrity in all its endeavors.*

ACES' Planning Process

Notes

● Why does ACES need a planning process?

The pace of change is accelerating within issues related to the disciplines and the education, research, and outreach functions of ACES. As a result, a systematic approach will help guide the College through the changing environment as it seeks to achieve its mission. These strategic planning efforts are designed to put such an approach in place in order to

- *communicate the College's present strategic directions,*
- *identify and address important issues that affect ACES and its clients, and*
- *make choices that will set future directions for ACES.*

● Who is the audience for the plan?

The planning process is intended to involve all segments of the College of ACES, including University of Illinois Extension and the Illinois Agricultural Experiment Station. Broadly speaking, anyone with a stake in the success of ACES or a claim on the resources or services of ACES is part of the intended audience for the plan. More than that, though, the goal is to offer all stakeholders the opportunity to participate in the planning process.

● What steps have been taken?

The current planning effort is built upon the foundation of several preceding strategic planning processes undertaken by ACES and its principal stakeholders, including

- *University of Illinois's strategic plan, "Framework for the Future" ⇒ campus budget reform*
- *Illinois Council on Food and Agricultural Research (C-FAR)*
- *USDA/Cooperative State Research, Education, and Extension Service*
- *Chancellor's Commission on Extension*
- *Task Force on Futuring ACES*
- *University of Illinois Extension: Program and Staffing for the Twenty-First Century*

Much change has taken place since the College's extension and departmental reorganizations in 1992 and 1995, respectively. Subsequent administrative planning led to the development of ACES' Mission Statement, Mission Themes, and Values. The academic departments, University of Illinois Extension, and the Illinois Agricultural Experiment Station contributed goals and undertook strategies related to their respective missions. Still, there is much to do, and the goal is to design an ongoing, dynamic planning process that will foster effective planning and strategic thinking as key components of the culture of the College and its operations.

● **What is the current stage in the process?**

Version 1.0 of ACES' strategic plan represents the first formal iteration in the College planning process. The established ACES' Mission Statement, Mission Themes, and Values form the basis for this version, which outlines established, emerging, and intended strategies in ACES. This plan was developed with input from representatives of the College's teaching, research, and extension branches, and it was reviewed by College and department administrators, faculty, and staff.

● **What are the next steps?**

Version 1.0 is a tool for engaging ACES' stakeholders in strategic planning that will continue in the coming months as well as in future years. Internal and external advisory committees for the College and leaders among alumni will play a crucial role in crafting subsequent versions of ACES' strategic plan, beginning in 2000–2001. ACES will solicit additional input to the ongoing planning process from other stakeholders, such as campus administrators, students, alumni, and various interest groups.

ACES' strategic plan will serve as the framework for decision making within the organization in a variety of areas, including

- *strategic and program plans for departments and subsidiaries,*
- *special initiatives and action plans, and*
- *preparation of future College budget proposals and initiatives.*

An understanding of the relevant forces shaping ACES and its mission is essential to developing a strategic plan for the College. Forces of change are challenges to traditional paradigms; to conventional understandings of the food, natural resource, and community systems; and to the established ways of doing things. While these forces are many and varied, a few major change agents stand out. To continue effectively meeting the needs of people throughout the state, ACES must address the changes described here. ACES' planning efforts should reflect awareness of these areas of change and the implications they have for the College's mission.

● Demographic Change and Urban Development

Key Trends:

The population of Illinois continues to become more urban.

Greater diversity of the population predominates in urban areas, but diversity in rural areas is increasing as well.

The proportion of Illinois's workforce involved in agricultural production and manufacturing is declining as more employment opportunities are concentrated in nonmanufacturing sectors, including technology-related fields.

Despite competition for nonagricultural usage, the vast majority of land in Illinois (76.5%) is devoted to agriculture.

Illinois is a major urban-industrial as well as rural-agricultural state. Illinois's population continues to become more urban. Eighty-five percent of the state's 12 million residents live in metropolitan areas, with the fastest-growing localities surrounding Cook and DuPage counties in northeastern Illinois and adjacent to St. Louis in southwestern Illinois. While Illinois's total population is expected to grow slowly over the next decade, the population of many predominantly rural counties is expected to continue to decline.

Illinois's population is also becoming more diverse. In the next 20 years, the Hispanic population of the state is expected to double, while the non-Hispanic white population will decline and the African-American population will hold relatively steady. In 1950, one in 13 Illinois citizens was considered to be from a minority group. By 1990, that ratio was one in four, and by 2020, it is expected to be one in three. In urban areas, the one-in-three ratio already exists. Although many nonmetropolitan counties

contain growing minority populations, most of them are not truly multiethnic. Statewide, close to 6% of the nonmetropolitan population is nonwhite or Spanish speaking. As the population becomes more diverse, communities may have to address special challenges in terms of building community consensus, and institutions and social service providers may find themselves challenged to deal with more and different demands on their services.

Illinois has also experienced a shift in the workforce during the past two decades: employment in the manufacturing and agricultural production sectors has declined while employment in nonmanufacturing sectors has increased significantly. Growth in technology-related fields, fueled by innovation, has been an important driver of Illinois's recent economic transition. Illinois has the seventh highest per capita income in the United States, but income in the metropolitan areas is one-third higher than in nonmetropolitan areas and is growing at a faster rate. Growth in income (3.0%) and employment (2.0%) in metropolitan areas exceeds income (2.4%) and employment (0.3%) growth in nonmetropolitan areas.

The farm population of Illinois has declined to approximately 1.6% of Illinois's total population, down from 2.7% in 1980 and 3.8% in 1970. However, the vast majority of Illinois's land is devoted to agriculture. Of 35.6 million acres of land in Illinois, 76.5% is agricultural, 11.3% is woodland, 3.1% is wetlands, 5.8% is urban or built-up land, and

the remainder is open water or other land uses. Total farmland area is gradually declining: it decreased by approximately 45,000 acres between 1992 and 1997. Urban development pressure and changes of land use from agriculture to other purposes are greatest in proximity to the major metropolitan areas of Illinois, but competition for agricultural land for other purposes exists throughout the state.

Key Questions:

What will be the makeup and interests of prospective ACES students, and how will ACES prepare to serve them?

How will ACES engage new or different stakeholders and maintain support of existing stakeholders?

What mix of research and outreach will be relevant in ACES' portfolio for changing audiences?

● Globalization

Notes

Key Trends:

Political events, market restructuring and fluctuation, scientific and technical development, and cultural and environmental shifts occurring around the world have an increasingly direct impact on the people and institutions of Illinois.

World population growth and urbanization continue, particularly in Asia, Africa, and Latin America. Population growth and economic development are accompanied by major changes in food demand and delivery systems.

Illinois's economy is increasingly dependent on world markets for food and agriculture and must continue to develop international partnerships to successfully operate in these markets.

Rapid information exchange has combined with increased market access and political openness in societies around the world to accelerate the impact of events and circumstances occurring on distant continents on the people and institutions of Illinois.

Knowledge, talent, and capital, as well as products and commodities, flow much more freely, and quickly, across borders. Myriad issues, including global growth and development, market access, scientific and technical development, competition, environmental impacts and climate change, and cultural impacts on families and communities, will have ever-greater effects on the decisions and actions taken locally in people's jobs, lives, and institutions.

Although world population growth is slowing, an increase of 1.5 billion people, or 25%, is nonetheless expected by 2020. Ninety-six percent of that growth will occur in less-developed areas of Asia, Africa, and Latin America. Despite serious pockets of hunger and malnutrition throughout the world, agricultural productivity has generally kept pace with increasing demand, contributing to increased life expectancy and population growth. But the world food economy still faces challenges. Many of the poorest nations will have difficulty increasing agricultural productivity. At the other end of the spectrum, developing nations with rapidly growing incomes are experiencing dramatic changes in their food systems. These changes include consumer demand for more diversity

in food products and services, such as increased demand for livestock products and, in a related trend, more demand for animal feed.

Illinois has a major stake in world markets for food and agriculture. In 1998, some \$3 billion of agricultural and food exports originated in Illinois, ranking Illinois fourth in export shares among the states. Illinois was second in export of feed grains and products (mainly corn and corn gluten feed), second in soybeans and products, eighth in wheat and products, and seventh in animals and products. At the same time, the United States and Illinois have been growing importers of food products, such as fresh fruits, vegetables, other horticultural products, tropical products, seafood, meats, and processed foods. Trade-related issues are critical to the welfare of Illinois agriculture and are important to Illinois agribusiness and consumers as well. Knowledge is not confined within borders. To retain a competitive edge in innovation, international partnerships are essential.

Key Questions:

How can ACES help Illinois's food and agricultural sectors meet the challenges related to major structural changes in global demand and remain competitive in the global marketplace?

What research, education, and outreach efforts can ACES undertake to help sustain viable agricultural and natural resource systems in Illinois and globally?

What is ACES' role in ensuring that safe and secure food systems are developed globally to meet the needs of a growing population?

How must ACES students prepare to function effectively in a global environment?

● Information Age

Notes

Key Trends:

Information technology has dramatically transformed how agricultural business is conducted, improving efficiency in crop systems, facilitating precision agriculture, and enhancing environmental and pest management.

Information and communications technologies encourage new approaches for developing and delivering educational programs and training.

Developments in information technology and computational power continue to accelerate, and adoption of technology is equally rapid.

The current period has been dubbed the information age. Far-reaching effects of digital technology are obvious in the enormous variety of products and services people use routinely in their lives and work. Advances in information and communications technology fuel economic growth and productivity; greatly influence the trend toward globalization; lead to significant changes in the openness and governance of societies around the world; accelerate development of powerful new tools for analyses, processes, and communication; and raise large and complex issues, such as how to manage change, cope with threats, and leverage opportunities.

Information technology has transformed the way business is conducted everywhere, including in agriculture. For example, specific applications of geographic information systems (GIS) and global positioning systems (GPS), combined with other technologies for precision agriculture, promise efficiency and improvements to crop systems, environmental management, pest management, and the like.

The new information and digital technologies have also catalyzed robust scientific investigation, increasing speed, encouraging novel methods, and expanding capacity to acquire and analyze data. In higher education, for example, rapid and extraordinary access to information and new digital tools present a large menu of challenges, not the least of which are

training people to use the available technology and challenging them to find new ways of applying technology for desirable outcomes.

In addition, new technologies create opportunities for using other modes and methods of educational program development and delivery while simultaneously raising new competitive issues for education. ACES students will be required to demonstrate proficiency in applications and uses of technology.

Key Questions:

How will ACES and its departments and subsidiaries stay at the cutting edge of applying changes in technology and using information technology and systems effectively?

How will ACES research priorities be affected by improvements in technology and computational capabilities?

How will ACES adapt its educational methods and delivery systems to make effective use of technology for improved learning?

● Life Sciences Revolution

Notes

Key Trends:

Rapid progress is being made in understanding molecular processes and genomes of important species.

Funding sources for research have focused strongly on investments in biotechnology, especially in areas related to health.

Agricultural applications for biotechnology have been rapidly adopted.

Resistance to biotechnology has increased among interest groups and the public.

Technology currently in use and technology on the horizon will bring major changes to agricultural and food systems as well as to families and communities. The new frontier of life sciences technology, focused on advancing knowledge of fundamental molecular and metabolic processes, falls squarely within the mission of ACES. The threshold of the life sciences revolution has already resulted in commercial applications that portend benefits for agriculture and human health. Furthermore, the powerful tools of biotechnology have yielded extensive data on important genomes that hold out the promise for more valuable applications in the future. Through applying advances in digital technology and blending traditional disciplines (ranging from plant and animal agriculture to health, medicine, and engineering), entirely new areas of research opportunity have been revealed. Myriad applications to life sciences, animal and plant systems, food processes, and the like will create entirely new alternatives in agriculture, food, and natural systems management.

The prospects for new biotechnology research are exciting, but this area also presents public research enterprises such as ACES with significant challenges. The investment in terms of scientific capital and infrastructure is high, and competing interests for investment are many. The development of very valuable technologies raises intellectual property issues

between private firms and public institutions. The accelerating pace of discovery also strains the abilities of the scientific community to evaluate fully the effects of new life sciences or biotechnology applications and to explore the economic, environmental, and social concerns these applications raise. Furthermore, although the University of Illinois has in place key elements of the human and physical resources needed to conduct this research, particularly in ACES and other units on the Urbana-Champaign campus, several competing states have invested in biotechnology on a larger scale earlier than Illinois.

As biotechnology has begun to impact agricultural systems, new questions and issues have been raised about its applications. A lack of public confidence in and understanding of biotechnology may be the most serious challenge to research and application. Even early biotechnology applications in agricultural and food systems faced opposition in Europe and sparked concern among segments of the public in the United States and elsewhere. Consumer concerns about food safety are complicated further by debates about biodiversity and environmental impacts, potential imbalances of supply and demand, large-scale investment in the private sector, and other related issues. A role for public research universities and the College of ACES is quickly emerging: they must generate not only basic knowledge from discovery but also an ability to evaluate new processes and educate people with reliable information.

Key Questions:

How can ACES effectively leverage new investments (for example, Illinois VentureTECH, including the planned Post-Genomics Institute) to assume leadership in biotechnology and capture benefits for Illinois?

How can ACES productively contribute to the understanding of the social and environmental impacts of biotechnology?

What is ACES role in helping to realize more rapidly the positive benefits of biotechnology (in improving human health, for example) for consumers and the public?

How will ACES research in biotechnology be related to other disciplines, such as medicine?

How will issues of intellectual property protection be resolved to accrue benefits to Illinois, the University, and ACES while providing incentives for continued discovery and development?

● Agricultural Restructuring

Notes

Key Trends:

Farm income has stagnated, causing additional stress in the Illinois agricultural economy.

Consolidation in agricultural production and in agricultural and food-related agribusiness has accelerated in the late 1990s.

Animal agriculture has experienced a net decline in Illinois.

Growth of the small, part-time producer sector, increased off-farm employment, and migration of urban dwellers into some rural Illinois communities are further segmenting the rural and agricultural audiences.

In recent years net farm income in Illinois has declined substantially, dropping by almost one-third in 1998 alone. While farm income is historically volatile, agriculture's current reduced profitability has coincided with a major restructuring and consolidation phase in the agricultural and food sectors of the U.S. economy. The long-term trend in Illinois is toward fewer and larger commercial farming operations. The average farm size increased from 342 acres in 1990 to 352 acres in 1997, while the number of farms declined from 83,000 to 79,000 in the same period. The number of very small farms (less than \$10,000 in gross sales) has actually increased, while the number of large farms (over \$100,000 in gross sales) has held steady, and the middle group has lost the greatest numbers. The impact of consolidation becomes more apparent when looking at production statistics: in Illinois, 31.7% of farms produce 86.2% of agricultural output. The restructuring of farm organization results from a variety of factors, including competitive pressure, economies of scale, and specialization in general.

Of the 27.8 million acres of agricultural land in Illinois, 23.6 million acres were harvested for agricultural and related crops in 1998. Corn production comprised 10.45 million acres, while soybeans were produced on a record 10.55 million acres, and winter wheat was grown on 1.2 million acres. Illinois ranked second in the United States in 1998 for corn and

soybean production. Of the total of farm marketing cash receipts in Illinois, \$7.7 billion in 1998, crop cash receipts contributed \$6.2 billion. Corn contributed 38%, soybeans 34.1%, and all other crops 7.8% of the total cash receipts. Crop systems, particularly corn and soybeans, clearly are the largest present contributors to Illinois's agricultural output.

Animal agriculture contributed \$1.6 billion of 1998 revenue to Illinois producers, accounting for about one-fifth of total cash receipts and down 18% from 1997. It is also important to note that support industries generate approximately \$12 billion of economic activity annually in Illinois. Major concentrations of livestock are located in northwestern and southwestern parts of the state. In 1998, Illinois ranked fourth in U.S. hog production on 7,000 farms. Hogs accounted for 8.8% of total cash receipts, down 33% from 1997. Cattle and calves, produced on 26,000 Illinois farms, contributed 6.1% of cash receipts, down 6%, and dairy accounted for 4.1% of total receipts, up 7%. Animal agriculture, particularly independent swine production, is under stress in Illinois. Faced with rapid integration of the industry, competitive pressures have resulted in more Illinois hog production moving into larger units under contractual arrangements, alliances, or corporate ownership. While seeking to be competitive and efficient, Illinois livestock producers also face serious challenges to comply with expectations for protecting the environment and water and air quality, achieving higher standards of quality and safety for animal food products, and ensuring animal welfare.

Driven by the need to be both consumer-responsive and highly competitive, processors and agricultural investors have developed new models of organization in agriculture, integrating functions that were previously independent. As they seek to capture value in the marketing chain and lower costs for final products, processors and producers have forged alliances, production contract arrangements, and large-scale integrated operations. Changes in the food marketing system have fostered increased emphasis on food processing and reliance on global markets. The current distribution of revenue in food systems is approximately 17.6% to agriculture, 32.9% to food processing, 24.4% to retail sales, 22.7% to food service, 0.5% to seed/genetics, and 1.8% to chemicals/drugs. Illinois produces 10% of the processed foods in the United States and ranks second among states in production of foods and ingredients. Chicago's commodity futures and financial markets now reach around the world, tying food and agricultural businesses together to manage risks associated with rapid market changes. In addition, Illinois is a major supplier of agricultural products to global markets, and the ability to deliver those products to consumers all around the world has a direct impact on the well-being of Illinois agriculture.

Today's food and agricultural firms adopt technology readily but often bypass traditional sources of information and knowledge. At the other end of the spectrum, an increasing number of residents are operating small farms on a part-time basis, and for most of these operators, agriculture is not a primary source of income. This group of agricultural producers may lack familiarity with conventional information sources. ACES will have to find new ways of reaching the entire spectrum of clients.

Key Questions:

How will ACES provide effective knowledge and education to the consolidating commercial agricultural sector and to specialized, small-scale, or part-time producer segments?

How will ACES programs be relevant in more-integrated food chains?

What are the most important issues and who are the key audiences in the restructuring food and agricultural sector, and what is the appropriate level of effort to address them?

Notes

● Environmental Awareness

Key Trends:

Development and population pressures compete with agriculture for natural resources.

Awareness and understanding of the environmental effects of agricultural systems and natural resource management have increased.

As cropping systems and animal production systems have consolidated and intensified, concerns about the effects of these systems on Illinois's water and soil quality have increased.

The activities of Illinois's large population and many industries, and the infrastructure needs of urban communities, create competing demands for the finite land, water, biotic, and other natural resources of the state. Over the past several decades, public concern about the environment has grown, and knowledge of environmental and natural resources systems has increased across the entire spectrum of biological and ecological study. Greater value has been attached to the environment as integral to the quality of life and to the posterity of natural resources for future generations. Recent years have witnessed trends toward more regulation of activities having potential environmental impacts and development of better management practices.

Andrew Draper, University of Illinois president from 1894 to 1904, proclaimed that, "The wealth of Illinois is in her soil and her strength lies in its intelligent development." He knew the importance of Illinois's natural resource endowment. Illinois is gifted with diverse soil types and a climate range that allow producers in the state to grow many grain, oilseed, forage, vegetable, and horticultural crops. The ecology of Illinois is particularly well suited to cropping systems, comprised mainly of corn, soybean, and winter wheat. Cropping systems containing these major and several minor crops cover 65% of the land surface of the state. Barring major unforeseen environmental change, epidemics of pests, or

changes in land tenure and use, early twenty-first-century Illinois will likely continue to be dominated by similar cropping systems.

As Illinois agriculture has consolidated and intensified, and as communities of nonfarm residents have continued to settle and grow in proximity to modern agriculture, a variety of natural resource and environmental issues have arisen. Water quality, especially in relationship to the use of nitrogen and other agricultural inputs, is a particularly significant environmental concern, as are issues of waste management and odor control for livestock operations. Biodiversity is an important concern for management of Illinois's ecosystems, raising issues ranging from pest management to conservation of genetic and other resources. The impact of human activity on air and water quality, potential climate changes, and land and soil resources has important ramifications for the future potential of Illinois agriculture.

Powerful new tools are now available to better understand environmental impacts and to improve management practices. The geographic information system (GIS) helps users to map, analyze, and better understand the diverse landscapes of Illinois, and the global positioning system (GPS) allows for more precise application of inputs and better controls in agriculture. Biotechnology has increased the array of pest management strategies and may offer solutions to a wide range of other problems, from odor control in animal production to nitrogen fixation in plants.

Key Questions:

How can ACES contribute to management strategies that will provide for viable agriculture while also preserving and maintaining the quality of natural resources?

How can ACES devise strategies for deploying technology in ways that mitigate the deleterious effects of agriculture on the environment?

How can ACES help sustain and improve agricultural systems in an increasingly urban state?

ACES' Strategic Capabilities

Notes

- Unique capabilities characterize the College of Agricultural, Consumer and Environmental Sciences, providing the fundamental basis for setting realistic and relevant strategic agendas. Among those capabilities are the following:
 - *As a unit of the University of Illinois, the College of Agricultural, Consumer and Environmental Sciences is part of a world-class, comprehensive university. The University of Illinois community connects recognized faculty and excellent programs across many disciplines, provides high-quality facilities and services, and maintains a research orientation among the strongest in the nation.*
 - *Consistent with the land-grant mission of the University, ACES excels in teaching, research, and outreach and functions cohesively through the College and academic departments, the Illinois Agricultural Experiment Station, and University of Illinois Extension.*
 - *The College delivers well-coordinated programs, addressing the major challenges of providing food for the twenty-first century while preserving and enhancing quality of life for people and conserving natural resources.*
 - *The College of ACES delivers excellence in applied and basic sciences that cut across agriculture, food, environment, people, and communities.*
 - *Already at the cutting edge of biotechnology research, ACES occupies a leadership role along with the campus community for biotechnology and the Governor's Illinois VentureTECH initiative, which includes planning for the Post-Genomics Institute.*
 - *The College also provides leadership in developing the campus research park; in realizing the University's initiatives for economic development; and in monitoring and improving other important areas, such as the environment and natural resources, function and safety of food, economic and human development, and food and agricultural innovation.*
 - *The Princeton Review ranks ACES among the top five colleges of agriculture in the nation. Science Watch identified Illinois as one of the top five universities in the United States for recent scientific contributions in the agricultural sciences. ACES units, programs, and faculty are nationally and internationally recognized for their excellence and impact on research and innovation.*
 - *ACES offers undergraduate students rigorous educational opportunities across a range of 43 undergraduate options in seven academic departments, and graduate students in ACES are afforded opportunities to excel in highly regarded academic and research programs.*
 - *ACES responds to well-organized, proactive, and politically influential constituencies and stakeholders, leading to a wide array of partnerships and collaborative efforts. The traditional agricultural constituency has strong vested interests in the College as well.*
 - *The College of ACES serves a statewide clientele, connecting to the public with nonformal educational programs in every county through 76 local units of University of Illinois Extension. Many ACES programs and the individual*

efforts of faculty and staff reach specific audiences locally, statewide, nationally, and internationally, ranging from segments of industry and the scientific community to various public interest groups.

- *The College fosters dynamic operating partnerships and relationships through affiliations and agreements with others, both on campus and externally. Longstanding arrangements, such as local relationships with University of Illinois Extension councils and with state and federal funding partners, provide critical support and direction to ACES. The Illinois Council on Food and Agricultural Research (C-FAR), a unique proponent of research in Illinois, helps to focus science on critical problems and issues. C-FAR efforts have resulted in the largest influx of new state research funding in recent years.*

● ACES' Strengths

The College of Agricultural, Consumer and Environmental Sciences has numerous strengths, which are essential building blocks for the future of the College.

- *The College attracts top students to its programs, and graduates with degrees from ACES are in demand from employers and other research institutions.*
- *The College demonstrates a serious commitment to scientific research and science-based education. Incentives in ACES encourage superior scientific output.*
- *ACES is committed to a strong basic-science underpinning as well as to providing crucial linkages and commitment to scientific applications in disciplines relevant to the College's mission.*
- *The College of ACES vests significant management authority in the academic departments and other units, which in turn provide a high degree of autonomy to faculty and program managers.*
- *The decentralized structure of the College provides strong incentives for faculty to pursue novel scholarship and seek extramural funding. Consequently, decision making is delegated to a significant degree, contributing to an entrepreneurial notion.*

● ACES' Challenges

ACES also faces challenges, and how the College approaches these challenges will be critical to future success. Success is the progressive realization of a worthwhile purpose; thus, identifying a purpose, recognizing worth, and taking purposeful action are essential to meet ACES challenges and overcome weaknesses.

- *Due to the breadth of ACES' mission, tensions continue to exist between competing program goals. Perceptions vary within and outside the College regarding progress toward realizing a proper balance of goals.*

- *The College faces strong competition for recruitment and retention of the best faculty and scientists in priority areas.*
- *Overall faculty numbers have stabilized at 242 full-time equivalent, down from 295 full-time equivalent in 1988.*
- *ACES students, staff, and faculty are less connected to rural and agricultural backgrounds than in the past, resulting in new and different expectations of the College by these important stakeholders.*
- *The College of ACES has yet to achieve the desired level of diversity in the faculty, staff, and student body. Recruitment of minority and women faculty, staff, and students remains a high priority.*
- *The organizational culture in ACES is successful in advancing individual scholarship, but the College is seeking creative incentives for encouraging teamwork and collaboration within and across disciplines.*
- *Financial resources controlled by the College and departments tend to be sunk in fixed costs, mostly personnel costs, with opportunity for change largely at the margins. As change accelerates in society, ACES needs to achieve more flexibility in its systems.*

- ACES' initial planning efforts began with an analysis of how traditional mission themes can be applied to the primary social, environmental, technological, economic, and demographic changes occurring today. The objective has been to establish specific goals that have relevance across disciplines and divisions within the College. Over the next several months the goals described here will be further refined based on feedback from all stakeholders. The ultimate aim is to establish an ongoing process for assessing, revising, and replacing specific goals and strategies.

Agenda 1: Learning and Leadership

MISSION THEME

Advance learning and develop human resources for leadership, stewardship, and service to agriculture, the public, and Illinois's resource endowment.

Goal 1.1:

Deliver Quality Education for an Expanded Population

Situation:

The foremost mandate of ACES' land-grant mission is to provide high-quality educational services for undergraduate and graduate students, as well as superior knowledge and education for outreach clientele. Illinois's population is becoming more removed from the food and agriculture sector, and as a result, potential students and faculty are more likely to come from urban areas than from rural backgrounds. In the future, therefore, the College's

ability to draw the most skilled undergraduate and graduate students and attract new audiences for outreach services will require revising educational programs to meet the needs and interests of Illinois's changing population. At the same time, demand for research focused on the urban and rural interface in Illinois will increase.

As a public institution, the College has a responsibility to provide students with the best education possible, returning value to Illinois taxpayers in the form of highly qualified students and graduates. Because the University of Illinois at Urbana-Champaign is a selective-admissions campus, the College is positioned well to compete for undergraduate students who demonstrate the most potential for success. Attracting superior graduate students has become more difficult in recent years, however, since graduate student enrollment has declined across the United States as a result of the long period of economic expansion. Graduate education is the essential building block for scientific inquiry and subject-matter expertise that provides the research base for academia, industry, and public institutions. Competition for the best potential students comes

from other research universities and, significantly, from industry as companies seek skilled graduates of undergraduate programs.

- **Implementation Strategies:**

- **A** *Expand emphasis on recruitment and retention of highly qualified faculty and instructors to help students prepare for dynamic careers.*
- **B** *Expand emphasis on recruitment and retention of highly qualified students to meet the needs of employers for qualified graduates.*
- **C** *Increase undergraduate and graduate student enrollments to meet the future needs for scientists and leaders in society and to give more students access to expanding opportunities in the food and agricultural sector.*
- **D** *Support ACES instructors' efforts to strengthen their teaching skills and to develop educational-outcomes measures that can be used to generate program improvements and to ensure that graduates receive the learning opportunities needed to be competitive in their chosen fields.*
- **E** *Support research and develop educational programs focused on issues arising from the interrelationship of Illinois's urban-industrial and rural-agricultural sectors.*
- **F** *Provide active, engaged learning environments in the form of internship opportunities, cooperative work programs, and the like.*

- **Goal 1.2:**

Expand Educational Services to Diverse Audiences

- **Situation:**

The College of ACES has changed significantly in recent years. The student body is no longer relatively homogeneous, predominantly of rural origins, or primarily male. Graduate students are almost as likely to be citizens of another country as they are to be American citizens. Furthermore, the faculty and staff of the College are less likely to share the common roots of rural, agricultural experience than in the past. However, the makeup of ACES still does not reflect the diverse population of Illinois, nor have trends in the College been keeping pace with changing demographics in Illinois society. As traditional audiences and stakeholders decrease in number, ACES faces the challenge of maintaining services for those clientele and enhancing relevance to new audiences.

- **Implementation Strategies:**

- **A** *Seek diversity of gender, origin, and culture in ACES faculty, staff, student body, and program clients in order to extend the reach and relevance of ACES programs to audiences that represent the diversity of society.*
- **B** *Introduce educational programs and curricula to add cultural diversity in ACES educational experiences, and diversify the faculty and student body to provide role models who will attract a similarly diverse mix of students and clientele.*

- **C** *Develop a research base for U of I Extension to reach diverse audiences in Illinois and to strengthen the relevance of educational programs for the state's urban areas.*

● **Goal 1.3:**

Adapt New Delivery Methods for Lifelong Learning

● **Situation:**

ACES' core business is learning, and advances in technology have created many opportunities to employ new methods for learning and new tools for delivery of education. As people in the United States are living longer, making multiple career changes, and leaving and returning to the workforce, it is particularly important to explore these new opportunities. Knowledge and disciplines, and their associated technical fields, are changing more rapidly than ever, as are the tools for doing business and living. Competitive and economic pressures are causing firms and individuals to redefine their businesses and occupations, and major issues are changing the paradigms by which people live and communities function. Faculty members need to stay abreast of changes affecting their careers, as do students, alumni, professionals, and the clientele of U of I Extension.

● **Implementation Strategies:**

- **A** *Enhance resident and distance education by utilizing information technology and by improving sources and delivery systems for timely, relevant, research-based knowledge and information.*

- **B** *Open new markets for educational programs, including customized learning programs and professional degree programs.*

- **C** *Meet the needs and interests of students, clients, and stakeholders for continuing education throughout their lifetimes.*

● **Goal 1.4:**

Expand International Dimensions

● **Situation:**

In their careers, ACES students will interact directly and indirectly with international issues and depend to a greater extent on international relationships. Research problems in agriculture, food, natural resources, and related life and social sciences will increasingly need to address the global dimensions of issues and the international implications of dynamic systems. Similarly, ACES service and outreach may well have potential for international impact, may be enriched by international perspectives, and will certainly need to account for issues that arise in Illinois and are affected by international events, conditions, and cultural factors.

Many faculty members in ACES already pursue international activities as a result of professional and personal interests. The College of ACES is initiating new efforts to facilitate and support international activities in collaborative research, graduate and undergraduate education, teaching abroad, scientific exchange, institutional strengthening, sustainable agriculture, and rural development.

- **Implementation Strategies:**

- **A** *Engage faculty, staff, and students in the international dimensions of their interests and create related opportunities in teaching, research, and outreach.*
- **B** *Enhance international awareness through educational experiences by introducing global perspectives to course content and expanding international opportunities for students, faculty, and staff.*
- **C** *Increase research collaborations with international scientists and scientific institutions.*
- **D** *Provide leadership on campus for international programs and opportunities.*

- **Goal 1.5:**

Develop Leadership and Partnerships

- **Situation:**

Effectively addressing complex local issues requires that people having diverse interests work together to achieve a shared vision. In many instances, decision making is becoming more decentralized, with local communities assuming greater responsibilities for allocating shared resources and undertaking joint responsibilities. Communities may include not only geographic areas, but also organizations, workplaces, or other institutions. University of Illinois Extension and 4-H youth programs have long been important institutions in local communities, preparing people to lead while depending on

thousands of local volunteers and leaders to ensure that programs are effective and relevant.

ACES students are academically talented and often come to the College with significant leadership experience as young people. As students graduate from the University and become productive members of society, they will assume a wide variety of leadership roles in their communities, workplaces, and fields of endeavor.

Furthermore, the College of ACES has developed and maintained numerous formal and informal partnerships that produce mutually beneficial learning opportunities and cultivate leadership in achieving goal-oriented results. As issues evolve and increase in complexity, partnerships are even more important for leveraging limited resources most effectively. Partnerships are not ends in themselves. Rather they are structures for achieving mutual goals and results.

- **Implementation Strategies:**

- **A** *Provide leadership-development education to enhance the decision-making capacity of families, firms, communities, and governments.*
- **B** *Create broad and diverse opportunities for all ACES students to develop personal and corporate leadership skills.*
- **C** *Develop local leadership for Extension that is capable of identifying the most relevant issues and providing effective direction for educational programming in individual communities.*

- ⓓ *Identify and train key volunteers at the local level and provide leadership-development programming for youth and adults.*
- ⓔ *Create and sustain partnerships that are results-oriented, that are consistent with the mission focus of ACES, and that fall within the parameters of ACES' priorities.*
- ⓕ *Strengthen ACES' working relationships with current partners through joint programming and advisory committee participation.*

Agenda 2: Quality of Life and Economic Opportunity

● MISSION THEME

Improve the quality of life and the economic opportunities for producers, consumers, families, and communities

● Goal 2.1:

Encourage Innovation Leading to Economic Opportunities

● Situation:

In advanced economies, remaining competitive requires innovation, and economic development is central to Illinois's future. The University of Illinois recognizes the connection between economic development and advanced technology investment. Over the past 20 years, employment in Illinois has shifted out of manufacturing and agricultural production while growing strongly in nonmanufacturing sectors. Growth in technology-related fields, fueled by innovation, has been an important driver of Illinois's successful economic transitions. In the food and agricultural arena, development through biotechnology applications will be an important factor in Illinois's future growth.

Illinois ranks seventh nationally in per capita income, but income in metropolitan areas is one-third higher than in nonmetropolitan areas and is growing at a

faster rate. Thus, economic opportunity is most apparent in the faster-growing metropolitan areas of Illinois. The presence of major markets in northeastern Illinois and near St. Louis gives Illinois residents in these regions advantages and opportunities to create higher marginal returns for their economic activities.

- **Implementation Strategies:**

- A *Support research to explore alternative uses of agricultural and natural resources, and develop outreach programs that can efficiently serve an expanding range of educational demands to yield products for novel and niche markets.*
- B *Encourage scientific and technical innovation, promote application of innovations to Illinois's economy, and provide effective means for commercializing innovations from ACES researchers.*
- C *Provide systematic leadership for campus, state, and national biotechnology initiatives designed to open up economic opportunities in food, agriculture, and related areas.*
- D *Create partnerships with private entities for research and development.*
- E *Implement business and entrepreneurial development programs for participants in Illinois's food and agricultural sector so that they can take advantage of small business and emerging growth opportunities.*
- F *Incorporate stronger entrepreneurial models and experiences in educational programs by supporting faculty members' and students' entrepreneurial activities that are related to the College's mission.*

- **Goal 2.2:**

Nurture Children, Families, and the Aged

- **Situation:**

Complex social and demographic shifts in American society have changed the way children are reared and families are structured. The number of single-parent households and households with two working parents has increased significantly, and in many cases people receive less support from extended families than in the past. These trends have had profound social and economic impacts. In addition, the state divorce rate remains high, affecting large numbers of minor children. It is also important to note that although the economy of Illinois has been strong, employment growth has been concentrated in metropolitan areas, and there are numerous pockets of unemployment and poverty. In 1996 the poverty rate in Illinois was 11.3% overall, but 18.5% for persons under 18, and 11.9% for people in nonmetropolitan areas. In the future, greater longevity as the "baby boom" generation ages will lead to larger numbers of seniors and retirees. As extended family ties weaken, issues of health care and care of the indigent increase in importance. For ACES, these changes and trends in society need to be understood in order to provide new and effective educational approaches to child development, family studies, and geriatric issues.

● **Implementation Strategies:**

- **A** *Support research and design educational programs to strengthen the systems that assist children and families.*
- **B** *Support research and design educational programs to mitigate the effects of poverty on children and families.*
- **C** *Support research and design educational programs to address issues unique to aging people.*
- **D** *Support research and design educational programs to enhance the development of tomorrow's workforce.*

● **Goal 2.3:**

Create Economic and Social Opportunities in Rural and Urban Communities

● **Situation:**

As farms consolidate and the rural population declines, the vitality of the local community is often threatened. Investment in rural communities is sometimes hindered by lack of access to social, educational, health, and economic services or to other forms of high-quality infrastructure, such as transportation, telecommunications, and product processing and shipping points. Rural areas are also at risk from urban development pressure and changes of land use from agriculture to other purposes. These shifts are most evident in communities close to Illinois's metropolitan areas. Associated with urban development and the consolidation of agricultural enterprises are problems related to

nonagricultural residents living in proximity to agricultural operations. In addition, more knowledge of the environmental impact of agricultural practices in areas near urban development has brought about a trend toward greater environmental regulation.

At the same time, urban growth in Illinois has resulted in new economic opportunities for diversified agriculture and horticulture, as well as food-related industry, in communities that have favorable access to those markets. The number of small farms (under \$10,000 annual gross sales) has also increased in various areas of the state as professionals and other property owners opt for rural lifestyles, and on many of these farms, agriculture is not the primary or even a significant income source.

● **Implementation Strategies:**

- **A** *Provide educational programs for campus-based instruction and for outreach that will foster community and economic development through teaching effective planning, governance, and decision-making processes.*
- **B** *Establish connections between communities to leverage resources and market opportunities.*
- **C** *Develop research and educational programs to enhance the viability of agricultural operations in concert with urban growth and to resolve issues related to land use, agricultural production, and rural economic opportunities.*
- **D** *Develop the analytical capacity to understand and describe for public and private decision-makers the significance of specific sectors of the Illinois economy.*

Agenda 3: Food and Health

MISSION THEME

Promote a safe, nutritious, abundant, and affordable supply of food that enhances human health

Goal 3.1:

Develop Effective Food Production and Delivery Systems

Situation:

The methods by which Americans obtain and consume food have changed. Foods are produced, processed, transported, prepared, and marketed in ever more specialized and complex systems, with the raw material an increasingly smaller part of the final product. The food marketing system allows more diverse food products to be originated globally, made available for extended periods of time, and processed into thousands of different forms.

The competitive nature of the food and agriculture business requires innovation for growth, and as U.S. culture changes, consumer demand for better quality, safer, and more diverse, convenient, and functional foods will grow. Furthermore, developing markets for food products made or produced in Illinois will enhance the economic well-being of Illinois residents. Understanding functionalities and interactions of foods, food constituents, and food ingredients is

important to developing safe, nutritious, and appealing foods. Understanding consumer lifestyles and the factors leading to consumer food demands is also essential to improving foods and increasing value in the food complex. How effectively producers, processors, researchers, and regulators coordinate their activities will play an important role in facilitating or hindering the development of better and new foods.

Implementation Strategies:

- A** *Design undergraduate and graduate programs to offer students access to and preparation for emerging opportunities in new structures of the growing food sector.*
- B** *Initiate new research and outreach efforts to meet the needs of Illinois's food industry and build partnerships with key segments of the food industry in areas such as quality management, packaging, and sensory evaluation.*
- C** *Establish partnerships with the food industry and other colleges to develop broad-based programs that directly serve the needs of food industry professionals.*
- D** *Build upon the interrelationships among agribusiness, agricultural marketing, and family and consumer-economics research programs to respond to the changing demands in food markets and food production.*

● Goal 3.2:**Promote Nutrition and Health****● Situation:**

The relationship between nutrition and human health is increasingly well understood in the scientific arena, but the benefits of this knowledge have not been fully realized. Scientists are identifying components of food that prevent illness, such as phytochemicals that reduce the risk of cancer. These so-called “functional” components of food differ from more widely understood nutritional components, such as calories and protein. This new knowledge has the potential to increase consumer well-being by providing additional choices for health-promoting activities.

At the same time, consumers have less direct knowledge of food constituents and preparation, and they face severe time constraints that affect their attention to health-promoting activities and their ability to process new information. Prevalent lifestyles and consumption patterns, ignorance of proper nutrition, and lack of consistent access to nutritious foods may hinder consumers’ ability to take advantage of the relationship between nutrition and health. The USDA reports that U.S. diets continue to contain fewer fruits, vegetables, and grains and more fats and sugars than recommended. The incidence of obesity is rising, even among poor people. This trend is particularly alarming among children and adolescents. For food producers and consumers

to realize the significant potential value from the links between nutrition and health, consumers need reliable science-based information in order to make dietary choices.

● Implementation Strategies:

- A** *Support research to establish the behavioral and physiological relationships between nutrition and human health, and promote the adoption of nutritional behaviors that best support human health.*
- B** *Promote excellence in research and graduate training through cross-disciplinary programs and collaboration established in the Division of Nutritional Sciences among food science, human nutrition, animal nutrition, and extra-College units.*
- C** *Establish Centers of Excellence to integrate scientific findings with food product development and information dissemination, and increase the resource base for multi-institutional research programs in nutrition and health, such as the Functional Foods for Health Program.*
- D** *Expand Extension programs in nutrition and health to educate the state’s consumers about proper nutrition and its relationship to long-term health.*

- **Goal 3.3:**

- Promote a Safe Food Supply**

- **Situation:**

The U.S. food system is changing rapidly in response to new international trade opportunities, new technologies, and changing consumer preferences. Many of these changes in the marketplace work in concert to make food safety a more important consideration for the food industry and the public. Changes in food production, handling, and consumption have introduced new hazards and have broadened the reach of those foodborne illnesses that do occur. Emerging pathogens, such as *E. coli* O157:H7 and *Salmonella* DT104, pose new public health threats. Many consumers at home and abroad are becoming more affluent, better educated, and more aware of the links between nutrition and health, and thus are demanding greater accountability from the food industry to provide a safe and wholesome food supply. Meeting these demands in a cost-effective manner poses significant challenges for the entire food system.

- **Implementation Strategies:**

- Ⓐ *Develop cost-effective technologies and risk-assessment tools to ensure food safety, thus enabling consumers to enjoy the benefits of a healthful diet of safe and wholesome food.*
- Ⓑ *Support multidisciplinary research teams to explore emerging food-safety hazards.*
- Ⓒ *Strengthen collaborations with the College of Veterinary Medicine to enhance food-safety research and education.*
- Ⓓ *Develop educational programs in food safety to train both current and future food industry professionals.*
- Ⓔ *Expand outreach programs geared toward the food industry in the state in order to help companies respond to growing demands for safe food at home and abroad.*

Agenda 4: Agricultural and Natural Resource Systems

MISSION THEME

Give stewardship to managed and natural resource systems to sustain environmental quality and agricultural competitiveness

Goal 4.1:

Respond Creatively to Changes in the Agricultural Sector

Situation:

Integrated agricultural production systems tend to give more economies of scale, control over product quality and marketing channels, and ability to serve consumer or end-user needs. However, the trend toward more integrated systems correlates with marginally fewer independent producers, less diversification of agriculture, and more concentration of economic development and environmental impacts. The economic health of Illinois agriculture has implications for local economies and communities across the state, for the business climate in firms both upstream and downstream from agriculture, and for social institutions ranging from schools to churches to municipalities.

Implications for the College of ACES are also important. The base of traditional stakeholders, especially

in production agriculture, is changing. Fewer commercial producers with larger economies of scale complement a larger number of part-time operators. ACES is challenged to define its fundamental roles of providing research-based service to stakeholders in the expanding segments of commercial agriculture and food systems while seeking to enhance opportunities and the quality of life for the larger base of traditional agricultural stakeholders, local communities, and families. Consolidation and integration trends throughout the food and agricultural system also contribute to the changing makeup of ACES students, as well as their potential career paths.

Implementation Strategies:

- A *Develop the capacity and institutional framework in the College of ACES for regularly evaluating the implications of trends in Illinois agriculture and its components, and incorporate the flexibility to adjust research, teaching, and outreach programs to respond to those trends.*
- B *Support research optimizing benefits associated with trends in the agricultural and food systems while seeking to mitigate the social, environmental, and economic risks of changes in this area.*
- C *Design research, educational, and outreach programs that are relevant to particular segments of the industry by consulting with ACES stakeholders and segmenting the audiences and clientele in the agricultural sector based on needs.*
- D *Develop plans for improving quality of life for agricultural producers and their families in the communities where they reside.*

- **Goal 4.2:**
Develop Effective Agricultural Systems

- **Situation:**

Crop and livestock systems continue to be the pillars of Illinois agriculture. Production efficiency is a key determinant of agricultural profitability. Major challenges for Illinois producers include greater integration of agricultural systems with the marketing chain to realize end-use values; application of precision technologies and biotechnology; threats from pathogens, pests, environmental stresses, and climate changes; and concerns about water quality, soil conservation, and interactions with other natural resource systems. A significant part of the feed supply used to sustain animal agriculture throughout the United States and around the world originates in Illinois. Corn and soybean, Illinois's primary crops, comprise the most important feed ingredients for poultry, swine, cattle, and other animal production systems, while also providing feedstock to industrial and food-processing industries. Important and growing segments of ACES' clientele also include producers of fruits and vegetables, ornamental and nursery products, specialty crops, and pleasure animals, as well as their related industries and activities.

Agricultural systems that depend on exhaustible resources cannot be sustained indefinitely. Illinois has finite land, water, air, biotic, and other natural resources. Since agricultural systems are integral and

very significant contributors to the social and economic fabric of Illinois, vigilant efforts are necessary to strengthen the long-term sustainability of the agricultural sector relative to other natural and social resources.

- **Implementation Strategies:**

- A *Develop technology and methods for improving the efficiency of plant and animal agricultural systems, lowering production costs, optimizing use of inputs, and increasing the viability and profitability of agricultural operations.*
- B *Develop action plans for maintaining leading-edge agriculture in Illinois and effectively managing long-term and short-term risks and challenges associated with plant and animal agricultural systems.*
- C *Support research to encourage the growth of viable alternative plant and animal systems, including horticultural crops, nursery products, and forage and livestock systems.*
- D *Develop and promote adoption of sustainable agricultural practices that make prudent use of renewable or recyclable resources.*
- E *Teach and practice an ethic that emphasizes the long-term common good for human and natural resources.*

● Goal 4.3:**Develop Management Strategies for Agricultural and Natural Systems****● Situation:**

Concerns about the interactions between agricultural and natural systems in Illinois have steadily grown. Issues of particular interest include soil integrity and erosion, water quality, agricultural chemical runoff, wetland and aquatic systems integrity, waste and odor management, monocultures and genetic diversity, pest management and resistance, wild species preservation, and river transportation systems. The variety of problems and issues associated with resource stewardship in the management and use of natural, agricultural, and urban systems requires knowledge of complex system dynamics. Illinois agriculture coexists with an increasingly urban population, and the demands on resources must be balanced for optimal benefits long into the future.

Together with breakthrough use of information technology, biotechnology will create entirely new options and alternatives in agriculture, food, and natural systems management. Specific applications of geographic information systems (GIS) and global positioning systems (GPS), combined with other technologies in precision agriculture, promise efficiency and improvements to crop systems, environmental management, pest management, and the like. Technology needs to be understood and evalu-

ated within the broader natural resource, social, and economic context of Illinois.

● Implementation Strategies:

- A** *Create interdisciplinary teaching, research, and outreach capabilities that focus specifically on interactions among agricultural, natural, and human systems.*
- B** *Develop management approaches to protect natural resources and the environment.*
- C** *Develop research, education, and outreach programs that enhance the capability of students, audiences, and ACES faculty and staff to understand and evaluate the agronomic, environmental, social, and economic implications of new technology.*
- D** *Support research, teaching, and outreach efforts of faculty, staff, and students in biodiversity, biotechnology, food safety and security, sustainability issues, and environmental issues.*

Agenda 5: Value and Benefits for Illinois and the World

MISSION THEME

Further the development of value-added crops, animals, food, and renewable-resource-based products for human and economic benefit

Goal 5.1:

Develop New Products and Market Opportunities

Situation:

Illinois agriculture has been traditionally based on crops and livestock. Major Illinois agricultural commodities suffer from lower real values as competition stiffens and productivity rises. Creating and retaining additional value for what are at present generic products is a major challenge. New products can be based on new characteristics or attributes, new processes, or entirely new primary sources. Consumers have demonstrated that they will pay for convenience, brands they trust, quality, and other attributes. Industrial end users for agricultural products seek value in terms of such things as product quality and consistency, specific constituents or attributes, and yield potential of the most highly valued end products. Illinois is already home to major agricultural processors, such as soybean crushing, corn wet and dry milling, ethanol and sweetener production, and

many downstream processes, as well as to a large food-processing industry base. Some 1,400 firms, from meat and dairy processors to a large variety of food-ingredient and finished-product manufacturers, serve wholesale, retail, and food service markets.

Illinois is at the center of the value-added food-processing industry and is the second leading producer of food products and ingredients in the United States. The food industry is the largest manufacturing industry in Illinois by sales and employment. Approximately 21% of cash receipts in the Illinois manufacturing sector can be attributed to the \$100 billion food, food-ingredient, beverage, and confectionery industries. The concentration in Illinois of these links in the food-value chain, coupled with the agricultural production base in the state, provide significant opportunities to develop commercial relationships and perhaps novel arrangements to deliver more value to end users and to share value throughout the chain.

● *Implementation Strategies:*

- *A Strengthen outreach programs to industry and producers, and devise new methods for effectively reaching more diverse and unique audiences for production and marketing of specialty and thin market products.*
- *B Expand research to develop new crop varieties, new crop uses, and new food products that can be produced in Illinois.*

● **Goal 5.2:**

Increase Public Awareness of Science and Technology in Food and Agriculture

● **Situation:**

As the farm population in Illinois and throughout the United States has declined to less than 2% of the total population, there is decreased awareness of the methods and processes by which food is produced and marketed to consumers. At the same time, the role of science and technology in food and agriculture has grown—new research and technological innovation help ensure a safe, nutritious, abundant, and affordable supply of food that enhances human health while promoting a profitable and competitive agricultural industry.

Many people have a limited understanding of the role science and its application to technology play in fueling innovation in agricultural, consumer, and environmental sciences. In some instances, such as in agricultural applications of molecular genetics and biotechnology, the public's hostility to science may limit innovation. In other cases, such as in the partnership with the Illinois Council on Food and Agricultural Research (C-FAR), it is important to convey how investment in scientific research is leveraged and what kind of impacts can be expected. The public is bombarded with conflicting messages from competing interests about many of these issues, and public research institutions have an obligation to create a basis of understanding and

confidence regarding applications of science and technology.

● **Implementation Strategies:**

- **A** *Convey impacts of scientific research to investors and consumers, provide unbiased research-based knowledge to the public, and help people learn to evaluate information and make decisions based on sound science.*
- **B** *Educate University of Illinois students about the role of agricultural, consumer, and environmental sciences and technology in enhancing the quality of life for people.*
- **C** *Expand research that provides information about the benefits and risks of new agricultural technologies.*
- **D** *Establish regular mechanisms for outreach and communication about emergent scientific issues and the social consequences of new technology.*
- **E** *Develop programs for use in K-12 education to assist teachers in curriculum development on topics related to the agricultural, consumer, and environmental sciences for their young students.*

● **Goal 5.3:**

Take a Customer-Oriented, Partner-Oriented Approach to Global Opportunities

● **Situation:**

World population is expected to reach nearly 9 billion by 2050 (an increase of about 30% from the 2000 population), with most of the growth occurring in Asia and Africa. Despite serious pockets of hunger

and malnutrition throughout the world, agricultural productivity has generally kept pace with increasing demand, so real prices of food have remained relatively constant during the past 50 years. Nevertheless, increasing food production in very poor countries represents a significant challenge. Food availability per person has actually declined in much of Africa, where the need for new technology is greatest. At the same time, the rapidly growing economies of Asia and Latin America will have increased demand for feed grain and livestock imports to satisfy rapidly diversifying consumer demands.

Illinois has a major stake in world markets for food and agriculture. Illinois ranks second in export of feed grain and soybean products, and the state is a significant export origin for other agricultural commodities and products. Furthermore, Illinois is a major transportation center, the home of the world's leading agricultural futures markets, and a center for many transnational firms in the food and agricultural sectors. Illinois consumers also enjoy a wealth of imported agricultural and food products. Trade-related issues are critical to the welfare of Illinois agriculture, the whole Illinois economy, and Illinois consumers. Knowledge is not confined within borders, and to retain a competitive edge in innovation, international partnerships are essential. Faculty members in ACES have an important role to play in the institution's success in leveraging opportunities with partners and customers around the world and in preparing ACES students to effectively

understand global issues and engage in solutions. The issue for Illinois is not simply to feed the world, but to discover the needs and wants of customers and partners around the globe and to find mutual benefits and value in those relationships.

● **Implementation Strategies:**

- Ⓐ *Establish and maintain exchanges and partnerships with key countries, institutions, and research centers around the world.*
- Ⓑ *Enhance the global dimensions of existing or proposed Centers of Excellence in ACES, focusing on disciplines and products that are important to Illinois.*
- Ⓒ *Position ACES as the lead institution worldwide for research on the most important food and agricultural products in Illinois.*
- Ⓓ *Rebuild international capabilities in the College by adding new faculty with international portfolios and experience.*
- Ⓔ *Provide timely outreach on emerging international issues with significance to Illinois through efforts such as the ongoing Illinois World Food and Sustainable Agriculture Program.*

Refining and implementing ACES' goals will require that the College's management systems be evaluated and improved. All changes to ACES' management practices must be planned in the context of the policies, procedures, and management systems of the University of Illinois at Urbana-Champaign. The strategies outlined here address how to effectively develop ACES' human, financial, and capital resources and how to restructure the College's institutional organization.

Human Resources

- **Achieve excellence in scholarship and service:** Invest in people, not only looking at traditions and past performance, but providing incentives and encouragement to make impacts from here forward.
- **Increase diversity:** Strive to increase diversity of ACES faculty, staff, and students at all levels of the organization, in order to achieve a balance that more nearly represents the stakeholder population.
- **Strengthen core capacity:** Develop a workforce sufficient to effectively accomplish ACES' mission and move forward with its vision, providing the capacity to teach, do research, and provide outreach at the highest levels of quality and service.

Financial Resources

- **Creatively use financial resources:** Develop the flexibility and degrees of freedom necessary to invest current resources and creatively fund important ventures.
- **Diversify financial resources:** Seek new and innovative sources of funding, leveraging campus and outside sources.
- **Create efficiencies and savings in operations:** Achieve savings in the numerous cost centers that can be reinvested in scholarly activity and service for the benefit of faculty, students, staff, and clientele.

Capital Resources

- **Develop a research infrastructure for the twenty-first century:** Invest in and implement the South Farms modernization project, invest in modernization and development of ACES' off-campus research and education centers, and invest in research facilities for the biotechnology initiative.
- **Maintain and improve the campus infrastructure:** Invest in College offices, classrooms, and buildings on campus.
- **Provide the capacity for adaptive research and commercialization:** Invest in incubator facilities and collaborative research facilities.
- **Upgrade information systems and the capacity for new modes of education:** Improve College capabilities in information technology, tools for education, and distance learning.

● Institutional Structure, Organization, and Management

- ***Achieve unity of purpose with decentralized management:*** Recognize the strengths of a decentralized management system while also creating incentives and a corporate culture that encourages teamwork and cooperation.
- ***Protect intellectual property:*** Address concerns about intellectual property rights for the University and faculty members, creating mechanisms to support commercialization of new technology.
- ***Increase the capacity for research coordination and interdisciplinary teamwork:*** Develop the capacity to foster research on multidimensional problems and to effectively leverage the unique C-FAR partnership in Illinois.
- ***Integrate research, education, and outreach functions:*** Further develop management structures, procedures, and incentives to effectively integrate ACES mission functions where improved results or impact can be expected.
- ***Manage information technology for peak efficiency and service:*** Enhance and improve ACES' ability to provide appropriate and high-quality information technology to College personnel and students and to effectively provide service to College clientele.

Next Steps

Notes

● Version 1.0 of ACES' strategic plan represents one stage in the ongoing development and refinement of the College's planning process. Following the dissemination of this version, planning will involve several steps:

- *Expand the planning and review process to include College, subsidiary, and department advisory committees as well as other interested stakeholders.*
- *Select priority goals from those included in this version or raised during the stakeholder review process.*
- *Develop action plans for achieving initiatives, both those that are already underway and new ones related to priority goals.*

Since the seven academic departments and the subsidiary units, such as University of Illinois Extension and the Illinois Agricultural Experiment Station, are ACES operating units, effective implementation of strategies must be closely connected to their planning efforts. Achieving this end will require

- *tying College strategic and action plans to department and unit planning in autumn 2000, and*
- *connecting all of these planning processes to the campus budget process for fiscal year 2002 and beyond.*

Stakeholder input and other refinements will likely result in a revised version of ACES' strategic plan (Version 1.1) early in 2001. The revised plan will carry forward the theme *Making Change Work*, and this and later versions of the plan will focus on

- *refining the important forces of change facing ACES,*
- *establishing clearer priorities for issues and strategies, and*
- *introducing means of measuring progress toward ACES goals.*

The utility of ACES' strategic plan will be measured by the level of discourse the process generates, the actions that flow from it, and the commitment to improve it over time.

- The College acknowledges Bill Adams, Kirby Barrick, Laurian Unnevehr, John van Es, and Richard Vogen for their time and effort in coordinating the development of this strategic plan. The College also recognizes ACES Administrative Committee for its oversight of the process and ACES Executive Committee for valuable commentary and input.

Prepared by Information Technology and Communication Services (ITCS) at the University of Illinois: editor, Joyce Atkinson; graphic designers, Larry Ecker and Deb Eisenmann; proofreader, Peggy Currid. Printed by University of Illinois Office of Printing Services.

Copyright © 2000 by Board of Trustees, University of Illinois.