



AGRICULTURAL SUSTAINABILITY INSTITUTE

College of Agricultural and Environmental Sciences



UNIVERSITY OF CALIFORNIA DAVIS AGRICULTURAL SUSTAINABILITY INSTITUTE (ASI)

STRATEGIC SNAPSHOT AT OCTOBER 2011

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"Strategic Snapshot" at October 2011

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OUR INSTITUTE AT A GLANCE

Insert Update: October 2011

Our mission is to ensure access to healthy food and to promote the vitality of agriculture today and for future generations. We do this through integrative research, education, communication and early action on big, emerging issues.

Our vision for the Agricultural Sustainability Institute. ASI will be a:

- ◆ **Convenor:** engaging diverse perspectives
- ◆ **Clearinghouse:** synthesizing, translating and communicating useful information
- ◆ **Think tank:** being the thought leader for interdisciplinary research
- ◆ **Pioneer:** taking early action on major issues
- ◆ **Incubator:** nurturing the next generation of agricultural leaders
- ◆ **Action tank:** linking science with action for sustainable solutions

Thematic areas

Agriculture, Resources, & the Environment: integration of agricultural systems at the farm/ranch and landscape levels.

Food & Society: integration of the food system, linking production, distribution and consumption.

Education & Leadership: integrated programs for sustainability education and leadership - kindergarten through post-graduate, including a **new undergraduate major in Sustainable Agriculture and Food Systems** and support for the **PhD in Agroecology** at UC Davis.

Sustainability Benchmarks for California's Food System: a crosscutting activity to produce scientifically-validated metrics and indicators to benchmark trends in sustainability of California's agriculture and food system.

Farmworker and Rural Community Wellbeing: a crosscutting activity to address salient issues affecting wellbeing of farmworkers, food system workers, and rural communities through research, education and extension.

Programs and facilities

UC ANR statewide Sustainable Agriculture Research & Education Program (UC SAREP)

Russell Ranch Sustainable Agriculture Facility at UC Davis

Student Farm at UC Davis

Inter-institutional Network for Food, Agriculture & Sustainability (INFAS), national network hosted by ASI

Team and associates

- ◆ Director Tom Tomich started January 2007
- ◆ Deputy Director Kate Scow started January 2008
- ◆ 24 other full and part-time staff of various programs and projects, including 4 postdoctoral fellows
- ◆ 8 graduate student researchers and 6 undergraduate assistants
- ◆ 9 ASI-affiliated professorships in agroecology, sustainability science, sustainability and society, economics of sustainability, plant disease management/soil microbiology, soil science, pollination ecology, invertebrate community ecology, and sustainable animal systems. A further 150 UC Davis faculty self-identified as strongly interested in sustainable agriculture.
- ◆ A distinguished advisory board of 25 leaders, representing diverse stakeholder interests.
- ◆ UC Davis CA&ES Dean's Office support in fundraising, events, administration, IT.
- ◆ An expanding network of partners, including UC Davis Students for Sustainable Agriculture, UC Cooperative Extension specialists and farm advisors, and other partners in various sectors.

Current annual budget: approximately \$3.2 million; campaign underway to increase to \$6 million.

EXECUTIVE SUMMARY: A YEAR TO CELEBRATE!

To: ASI External Advisory Board members, ASI staff, and affiliated faculty

From: Tom Tomich, Director, ASI & SAREP

Date: 28 October 2011

Re: **Celebrating and looking to the future**

What a great year we have had! I hope everyone associated with ASI shares my pride in our progress, including the significant milestones documented on the following two pages and the many achievements described throughout this year's "Strategic Snapshot", the annual update of our strategic plan. Like all we do, this snapshot is a team effort and I am grateful to my colleagues for their contributions. This year's snapshot includes a new monitoring and evaluation plan in Part V, "Indicators of Success". The other main additions are the annual work plans included in Part IV, "Themes, Initiatives, and Current Workplans." As usual, for your convenience, these sections and other new text in the Strategic Snapshot are highlighted in ***blue italics***.

High-profile celebrations this year included the inaugural Bradford-Rominger Sustainability Leadership Award in May, the long-awaited launch of our new undergraduate major in Sustainable Agriculture and Food Systems in September, and SAREP's 25th Anniversary celebration in October. Among other noteworthy events, we started ASI's first global project (in partnership with MARS, Inc.) and also have deepened our activities in the social dimensions of sustainability through our new initiative on farmworker wellbeing. Internally, we were able to regularize employment for two field workers at Russell Ranch, improving their take-home salaries and benefits, while cutting operational costs.

Overall, I believe ASI has reached new heights in our research and education programs, including high-impact publications, and in our staffing, teamwork, and partnerships, fundraising, prize-giving, communication, and event coordination (which, of course, is essential for all the celebrations). **If you have time to review 2-3 pages before our meeting, please focus on the milestones and achievements on pages 4-5 and the SAREP Solution Centers concept on page 6.** The SAREP Solution Centers concept for statewide engagement and outreach will be one of the main topics for our meeting. Please bring your ideas on specific topics for SAREP Solution Centers and any ideas for innovative funding opportunities that will enable SAREP to convert these ideas into statewide impact.

I look forward to working with you next week. We greatly appreciate the service of everyone on the board. Since this is our fourth annual External Advisory Board meeting, it also is natural that we begin a gradual process of board transitions. Please join me in expressing our gratitude for the service of departing board members **Mable Everette, Michael Pollan, and Dan Dooley**. Also please join me in welcoming our incoming board members for this year. **Barbara Allen-Diaz** will fill the DANR *ex officio* board position. Other new board members this year are **Karen Ross, Haider Nazar, Michael Dimock, and Kase Wheatley** (our new undergraduate representative). Additional transitions and additions will be announced over the coming year.

Milestones and Major Accomplishments

(December 2010 through October 2011)

- **25th Anniversary of the Sustainable Agriculture Research and Education Program (SAREP).**
- **Renewed SAREP small grants program:** SAREP funded grants to 14 projects totaling \$150,000 in 2011.
- **New crosscutting initiative on Farmworker Wellbeing launched by SAREP.**
- **ASI's first global project launched with a major grant from Mars, Inc.** to develop a framework for indicators of environmental, social, and economic sustainability of raw materials sourced by global food companies. Framework for this project, coauthored by ASI director, **published in *Proceedings of the National Academy of Sciences*.**

Food & Society Theme (primarily SAREP initiatives)

- As a result of demand from a large, urban school district, and **growing out of SAREP's work on a CDFA-funded Farm-to-School project, Fresh Point** (part of Sysco, one of the largest distributors in the U.S.) **began a process for source identification of family farms.**
- Two new graduate-level seminars on **Food Systems Analysis and Food System Assessment** were developed in response to student requests and were offered winter and spring 2011.
- Two peer-reviewed **articles published on SAREP's Farm-to-Institution and Farm-to-School research** in the *Journal of Agriculture, Food Systems and Community Development*.
- Only four months into this fiscal year, **SAREP's Building Regional Markets Initiative received more than \$230,000 in funding for new projects.**
- SAREP and the Children's Garden Program at the Student Farm are part of a **new UC ANR-funded Farm-to-School project focusing on professional development for teachers and food service providers**, evaluation of procurement trends, and 'plate waste' studies at schools.

Agriculture, Resources & the Environment Theme (including SAREP initiatives and the Russell Ranch Sustainable Agriculture Facility)

- **Energy use and greenhouse gas emissions studies** completed for almonds and processed tomatoes; the latter study also included water use. New funding received for similar studies of greenhouse gas emissions and energy use in almond processing and pistachio production.
- **California Nitrogen Assessment launched a two-stage peer review process of its results**, engaging scientific colleagues and other stakeholders.
- ASI staff and affiliated faculty contributed to **two major reviews for the leading journal *Annual Review of Environment and Resources***: "Energy Intensity of Agriculture and Food Systems" and "Agroecology: A Review from a Global-Change Perspective." The latter was co-authored by 16 UC Davis faculty and ASI staff.

- **Nine scientific papers based on research conducted at Russell Ranch** published in 2010-2011.
- **New science plan for Russell Ranch** tackles the challenge “Can we increase sustainability as we increase food production?”
- **Two new Russell Ranch projects:** 1) CDFA/USDA Specialty Crop grant funded project will research effect of cover crops on nitrate leaching 2) project in collaboration with the Center for Land-Based Learning will establish two new beginning farmer plots at Russell Ranch.
- **Two field workers appointed as permanent employees** (with full benefits including health insurance), who for many years had worked as temporary laborers through a labor contractor; **improvement in their status also reduces Russell Ranch costs.**
- **Russell Ranch Dried Tomatoes** will be offered for sale on campus and at the UC Davis Medical Center.

Education & Leadership Theme (including the Student Farm)

- **Sustainable Agriculture and Food Systems (SA&FS) undergraduate major received final approval in June, 2011. The Chancellor, Provost, CA&ES Dean, and Maggie Lickter (the first SA&FS graduate) spoke at the celebration.**
- Student Farm staff are providing **diverse learning experiences for traditionally underrepresented high school students, increasing awareness and interest in college studies and careers in sustainable agriculture**, in collaboration with the Center for Land-Based Learning, Grant High School, Soil Born Farms, and other partners.
- In anticipation of the new major and in response to increasing student participation in Student Farm activities, the **Student Farm launched a program planning and development project in early 2011.**
- Thanks to efforts of the CA&ES Dean, the **Bixby Endowment will fund the base budget of the Student Farm.**
- ASI is collaborating with interested students, faculty, staff and administrators to develop **academic programs for a campus ‘sustainable living and learning community’ in the Student Farm neighborhood.**
- ASI is working to revitalize the **Agroecology PhD program**, which is an area of emphasis within the prestigious Ecology Graduate Group at UC Davis.
- **Inaugural Shapiro Family Award for best dissertation in agroecology was awarded to Amanda Hodson**, 2010 PhD in Entomology.
- UC Davis PhD candidate in ecology **Kelly Garbach became the first recipient of the annual Eric Bradford and Charlie Rominger Agricultural Sustainability Leadership Award. USDA Deputy Secretary Kathleen Merrigan spoke at the ceremony** and presented the award in May.
- **Inter-institutional Network on Food, Agriculture, and Sustainability (INFAS)**, a national network hosted by ASI, is recruiting a network coordinator and is launching efforts to conduct a National Food System Assessment for the United States.

SAREP SOLUTION CENTERS: *General Concept for Discussion*

The UC Sustainable Agriculture Research and Education Program (SAREP) has two goals:

- To assist California farmers and ranchers in developing and implementing sustainable production and marketing systems; and
- To support California's rural and urban communities in understanding the concept and value of sustainable agriculture and participating in sustainable food and agricultural systems.

To advance SAREP's mandate to "develop and distribute information through publications and on-farm demonstrations," we are piloting development of **virtual SAREP Solution Centers** to use new communication and engagement methods to provide **information for decision support to farmers, ranchers, and communities across California, and a variety of outreach partners, including UC advisors and specialists.**

Each SAREP Solution Center will be **driven by users' needs**, which means that users will be involved in design and development from the outset. Although specifics will differ, SAREP Solution Centers will provide access to:

- **Web-based information portals** hosted by SAREP and dedicated to supplying a comprehensive spectrum of **up-to-date, credible, science-based information**, including **practical information in user-friendly formats** covering technical, financial, and regulatory aspects as well as links to supporting scientific publications and assessments.
- **Working prototypes** identified across the state to provide hands-on, real-world learning opportunities.
- **GIS-based information to guide users to prototypes that best suit their needs.** The geographic information system, hosted by SAREP, will include information on the environmental and social context of the specific prototypes (for example: irrigated cropland or rangeland; small, medium, or large farm; types of distribution models; connection to low-income communities and other attributes) that determine relevance for specific users.
- **Networks of qualified technical interpreters and resource people** to facilitate the learning experience.
- **Innovative funding models** tailored for specific solutions and exploring innovative combinations of private investment, public funding, and philanthropy. The modular approach to creation of SAREP Solution Centers also opens opportunities for innovative funding models to sustain engagement and extension functions.

Examples of possible SAREP Solution Centers: *closing the loop to convert farm waste to valuable resources (energy, nutrients, water), other sustainable energy alternatives for farms and ranches, best practices for fertilizer use efficiency and agricultural water stewardship, garden-based learning, food system assessment, values-based supply chains, urban agriculture, farmworker and rural community wellbeing, benchmarking agricultural sustainability, farm and ranch internships and apprenticeships ... and a host of other topics that could be developed incrementally as specific needs for information are identified and as this general concept is tested and developed further in the years ahead.*

I – STRATEGIC FRAMEWORK

What distinguishes ASI?

The units of ASI are held together and distinguished by a shared mission, vision, values and operational principles and a passion for excellence in sustainability science that can transform California agriculture and fully realize California's potential for global leadership in research, education, and action for agricultural sustainability. These strategic elements were developed collaboratively by ASI staff with input from advisory board members and other stakeholders. We welcome additional comments and suggestions at any time.

*Status: Changes and additions appear in **blue *italics*** below. The vision for ASI developed at the inaugural external advisory board meeting now reflects three years of refinements and is a completely articulated with this update. This year's snapshot includes a complete draft of Part V, "Indicators of Success". The other main additions to this version are the annual work plans included in Part IV, "Themes, Initiatives, and Current Workplans."*

1. Our mission is to ensure access to healthy food and to promote the vitality of agriculture today and for future generations. We do this through integrative research, education, communication and early action on big, emerging issues.

2. Our vision for food and agriculture:

- ◆ A food and agricultural system that is innovative, adaptive and profitable;
- ◆ promotes prosperity and equity for people working in agriculture and the food system and for their communities;
- ◆ provides healthy food for everyone;
- ◆ improves the environment and human health;
- ◆ builds awareness and understanding of the food system; and
- ◆ engages public participation in policy decisions affecting food and agriculture.

3. Our vision for ASI:

- ◆ **Convenor:** bringing diverse perspectives together
- ◆ **Clearinghouse:** synthesizing, translating, and communicating useful information
- ◆ **Think tank:** being the thought leader for interdisciplinary research
- ◆ **Action tank:** linking science with action for sustainable solutions
- ◆ **Pioneer:** taking early action on major issues
- ◆ **Incubator:** nurturing the next generation of agricultural leaders

4. Geographic scope of ASI:

- ◆ **California:** our primary mandate is to serve our home state, which is recognized widely as one of the largest and most dynamic agricultural sectors on the planet. The UC SAREP statewide program is an important mechanism for statewide impact through partnerships with UC Cooperative Extension specialists and county-based farm advisors, among others.
- ◆ **United States:** we are working to develop ASI's potential for national scope by hosting the annual National Symposium on Food Systems and Sustainability, which was launched in 2009, and through plans to host the new Inter-institutional Network for Food & Agricultural Sustainability (INFAS).
- ◆ **International:** we envision a gradual increase in international activities as appropriate opportunities arise, emphasizing academic exchange and scientific networking. In 2009, ASI hosted our first international scholar (Sakae Horimoto of Japan) and joined our first international scientific network when the California Nitrogen Assessment formally became a part of the ongoing MA Subglobal Assessments. In addition to national exchanges and global networks, our two regional priorities are linkages with programs in the Mediterranean, arid, and semi-arid agro-climatic zones (e.g., Australia, Chile, Egypt, Italy, South Africa, Spain, and the International Centre for Agricultural Research in Dry Areas) and with sub-Saharan Africa. (At this time, we do not anticipate creating capacity for international project implementation; instead ASI will collaborate with the CA&ES International Agricultural Programs Office at UC Davis.)

5. Our core values: creativity, inclusiveness, integrity, partnership

6. Our operational principles

Practicing sustainability: we strive to enact sustainability principles and practices in our own activities.

- ◆ **“Walking the talk”:** we work to use sustainable practices in our own operations and actively strive to embody our core values: creativity, inclusiveness, integrity, partnership.
- ◆ **Community:** we embrace and enact the UC Davis Principles of Community in our daily work.
- ◆ **Respect for all:** we affirm the inherent dignity in all people and endeavor to relate to all with respect, fairness and justice.

Legitimacy: we set our priorities and design our programs in response to concerns and aspirations of stakeholders representing the diversity of California

- ◆ **Spanning boundaries:** we serve the entire state, and all segments of agriculture and the food system.

- ◆ **Science in the public interest:** we are committed to transparency in governance and priority setting; to open access to results and information; and to accountability to stakeholders.
- ◆ **Historical awareness:** we recognize the University's historic, current, and potential future roles in shaping agricultural and food systems and their effects on environment and society. We strive to make informed and responsible decisions regarding research, teaching and outreach based on this knowledge.
- ◆ **Seeking consensus, while respecting differences:** our activities employ a common set of ground rules, including respect for different viewpoints.

Usefulness: responsiveness to stakeholders' needs – the broad interests of society as well as needs of specific groups – is key to the relevance of our initiatives and provides the necessary focus on real issues and opportunities.

- ◆ **Communication for impact:** we ensure that input from stakeholders consistently is sought and used effectively and that our products are translated to reach key audiences in forms they can use.
- ◆ **Integration of knowledge:** we actively seek and recognize the value of knowledge embodied in experience on farms and ranches, in communities, in industry, and in policy arenas.
- ◆ **Commitment to experiential learning:** we recognize the value of learning-by-doing and actively seek to integrate practical opportunities in our educational programs, training, and outreach activities.
- ◆ **Creating and sustaining a learning organization:** feedback, monitoring, evaluation, and impact assessment will be embedded in overall design of our activities.

Credibility: we hold ourselves to the highest standards of professional integrity and scientific rigor.

- ◆ **Forward-looking agenda:** we will create and sustain mechanisms to identify and assess emerging opportunities and threats, based on scientific analyses and stakeholder input and informed by global trends.
- ◆ **Broad scope, with multidisciplinary balance:** we integrate economic, environmental, and social dimensions of sustainability.
- ◆ **Scientific integration and synthesis:** our activities span big, inter-linked issues and multiple scales – ranging from molecular to global; past, present, future.
- ◆ **Open inquiry:** we promote critical analysis to challenge 'conventional wisdom' and to expand our understanding of technical, institutional, and policy options using the best natural and social science methods available.

II - INSTITUTIONAL ASSETS

ASI's foundations

II.1. Land Grant Heritage

The College of Agricultural and Environmental Sciences (CA&ES) at UC Davis has a 100 year history of serving agriculture and addressing environmental concerns in California and around the world. In 2006, CA&ES established ASI to focus research, teaching and outreach on the challenges facing agriculture in the coming century. ASI provides a hub that links initiatives and education in sustainable agriculture and food systems across CA&ES departments and divisions, across the University of California, and with other partners across the state. Issues facing the land grant system in the US include needs to (1) develop and expand research programs and academic curricula to reflect a contemporary view of agriculture and food systems, (2) remove barriers to interdisciplinary research, teaching, and extension, and (3) engage a wide variety of stakeholders to assess their needs and develop priorities to design useful programs and create effective means of communication. The Inter-institutional Network for Food and Agricultural Sustainability (INFAS), which is hosted by ASI and was endowed by the W.K. Kellogg Foundation in 2010, is designed to address a number of issues facing the land grant system and had its inaugural meeting at UC Davis on 11 November 2010.

II.2. Programs and Facilities

(See Appendix 1 for ASI organization chart and Appendix 2 for one-page descriptions of each unit or program.)

Sustainable Agriculture Research and Education Program (SAREP) – a statewide program of the University of California with capabilities in grant administration, knowledge management, communication and outreach. Changes at SAREP over the past two years have involved some difficult choices. One SAREP academic coordinator position was closed in 2008 (due to retirement) and two SAREP analyst positions and the IT manager position were phased out in 2009. Two new SAREP academic coordinator positions were recruited to provide scientific leadership for the "Agriculture, Resources and the Environment" and "Food and Society" thematic areas. Our long-serving Senior Public Information Representative retired in 2009; to provide those important communication functions, we recruited a new Communication Coordinator in October.

Status: SAREP grants program was re-launched with an RFP issued in fall 2010. In 2011, 14 SAREP projects were funded totaling \$150,000. They include 1 research grant (farmworkers), 5 planning grants, 5 education and outreach grants and 3 graduate student awards.

The UC Division of Agriculture and Natural Resources (DANR) sponsored a 5-year external review for SAREP in 2009. Key documentation is included in Appendix 12. Major points from that review include:

- ◆ **Structure:** ANR endorsed the consolidated ASI/SAREP strategic plan and external advisory board, as long as “the distinct mission and objectives of SAREP are delineated” in ASI strategic plans and annual SAREP work plans.
- ◆ **Governance:** recommended expanding the external advisory board, in particular to include UCCE representatives. (This has been implemented.)
- ◆ **Scope:** recommended expanding SAREP’s geographic coverage, stakeholder engagement, and commodity coverage.
- ◆ **Collaborations:** Recommended expanding engagement with UC ANR programs, workgroups, AES scientists, UCCE specialists, and county-based advisors.
- ◆ **Science-based approach and communications:** SAREP should be the premier source and statewide dissemination focus for ... unbiased, balanced, science-based information on sustainable agriculture.
- ◆ **SAREP grants program:** ANR recognizes the importance of the grants program in “impacting a greater range of programs”, “leveraging additional funds,” and “stimulating thinking”; the grants program “must be accountable in terms of reporting and communications.”

Based on its external review of SAREP, DANR renewed commitment to SAREP, with the next review planned to take place in three years. Taken together, these DANR recommendations are in accord with our own strategic planning and programming objectives for SAREP as a key unit of ASI.

Subsequent to the SAREP external review, DANR has gone through its own strategic review and reorganization and has launched five new strategic initiatives. *Status: Particularly over the past six months, SAREP and ASI have deepened involvement with two of the strategic initiatives launched by the UC Division of Agriculture and Natural Resources: “Sustainable Food Systems” and “Healthy Families and Communities”. With sponsorship from ASI, four graduate students presented results from SAREP research projects at the Sustainable Food Systems conference.*

Legacy of SAREP’s Biologically Integrated Farming Systems (BIFS) program--

BIFS projects typically included on-farm demonstrations, a collaborative model of outreach and extension to share technical information, and an organized program of monitoring key biological and economic variables to inform on-farm decision making. Between 1995 and 2002, SAREP funded ten multi-year projects in nine different farming systems--apple, citrus, dairy, prune (dried plum), rice, strawberry, tomato & cotton, walnut and winegrape -- through a competitive grants process. These projects were part of a larger set of initiatives including Biologically Integrated Orchard Systems (BIOS) projects coordinated by the Community Alliance with Family Farmers (CAFF) and the California Department of Pesticide Regulation’s Pest Management Alliance grants. Between 2002 and 2009, SAREP partnered with key UCCE advisors and specialists to acquire funding for two additional BIFS projects addressing fresh grape and lettuce farming systems. SAREP also led a workgroup to strengthen networking between UC researchers and extension staff with stakeholders beyond the UC system working on projects to encourage adoption of integrated farming systems.

BIFS projects demonstrated that when participating growers had evidence that yields and profits could be maintained with more environmentally-sound farming practices, they often adopted these practices on most of their acreage. Many non-participating growers were exposed to innovative practices through project outreach activities. There were many encouraging outcomes that emerged as a result of our BIFS projects. A few examples include:

- The West Side BIFS project (tomato & cotton) was instrumental in initiating a growing interest in conservation tillage among California growers.
- The Lodi-Woodbridge Winegrape project supported a regional sustainable winegrape growing program that eventually led to a certified eco-label for wines.
- Collaborations initiated by the Rice BIFS project led to a grower advisory group to guide much-needed research on alternative weed management systems.
- The publication of Agroecology in Action: Extending Alternative Agriculture through Social Networks by Keith D. Warner in 2007 used several BIFS projects as case studies to illustrate the value of learning sustainable farming practices through collaborative sharing of knowledge.

SAREP Solution Centers: Looking ahead to the next generation of BIFS. SAREP's leadership and collaboration in BIFS projects showed that growers can be willing partners in developing a more sustainable food and agriculture system. As ASI and SAREP agendas shift in response to stakeholder priorities and other developments, such as newer emphases on research and outreach at landscape level issues (in our Agriculture, Resources and Environment theme) and the community level (in our Food and Society theme) our work nevertheless must remain linked with (and grounded in) practical "grass-roots" experience exemplified by BIFS. Thus, SAREP's legacy of experience with collaborative innovation processes through BIFS that are designed, led and implemented by groups of farmers is an important component of ASI's institutional repertoire that complements researcher-designed and implemented experiments at the Russell Ranch Sustainable Agriculture Facility and student-led initiatives at the Student Farm at UC Davis. *Status: a general concept note and ideas for specific "SAREP Solution Centers" will be a major focus of the 2011 External Advisory Board meeting.*

Russell Ranch Sustainable Agriculture Facility – Russell Ranch Sustainable Agriculture Facility – a 300-acre facility that houses the Long-term Research on Agricultural Systems (LTRAS) and Sustainable Agriculture and Farming Systems (SAFS) projects; the only long-term research facility for research on sustainability in irrigated agriculture in a Mediterranean climatic zone and one of the few facilities of its kind anywhere. Funding has been below sustainable levels for years.

Status: ASI Deputy Director Kate Scow is in the final stages of development of a new scientific plan for Russell Ranch, which focuses on the question: "Can we increase sustainability as we increase food production?"

Key priorities in Russell Ranch planning include:

Integrative research at Russell Ranch:

- Diversify farming systems at Russell Ranch (i.e. perennials, market vegetables, mixed crop-animal systems, biofuels)
- Introduce more flexibility into the design of the systems to stay relevant and realistic
- Enhance capacity and promote research projects to address California's pressing concerns: competition for water, water use efficiency, climate change, habitat preservation, energy efficiency, air and water pollution
- Create a network connecting university research to landscape scale on-farm research (possibly building on SAREP's Biologically Integrated Farming Systems experience).
- Increase data collection from research projects at Russell Ranch; increase real time wireless data collection; make all data publically available and interactive.
- Facilitate and increase linkages with international interests in Mediterranean agriculture and sustainable development in general (Russell International)

Status:

Nine scientific papers published in 2010-2011, based on research conducted at Russell Ranch.

Continued research on soil biodiversity, including the relationship between microbial diversity and agroecosystem resilience and resistance.

Completed study of nitrous oxide emissions in furrow- and subsurface drip-irrigated tomato rotations with legume and non-legume cover crops or winter fallow fertilized at five different N rates.

Outfitted long-term plots, including one reduced-irrigation trial, with moisture sensors and irrigation management software with a donation from PureSense.

Two new projects: 1) CDFA/USDA Specialty Crop grant funded project will research effect of cover crops on nitrate leaching 2) project in collaboration with the Center for Land-Based Learning will establish two new beginning farmer plots at Russell Ranch.

Two Russell Ranch field workers appointed as permanent employees, who for many years had worked as temporary laborers. Improvement in their status also will reduce costs (projected net savings of \$2,600 in 2011-2012 and \$10,000 in 2012-2013).

Education at Russell Ranch:

- Create a “living laboratory” around Russell Ranch with facilities to support in-field teaching and student research
- Strengthen connections to other ASI programs and local community (i.e. Student Farm and SAREP)
- Encourage experiential education through class field trips, undergraduate internships and grants for graduate student research

Status:

Two undergraduate interns worked on research projects on reduced irrigation tomato production.

Two graduate students from Stanford University undertaking research at Russell Ranch: Gabriel Maltais-Landry (Vitousek Biogeochemistry Lab) and Yohei Iwasaki (MBA/MS Graduate School of Business/Stanford School of Earth Sciences).

Visiting graduate student from Shanghai, Daoyuan Wang, investigating relationships among drought, nutrient cycling, and microbial communities.

Russell Ranch communication as a two-way flow:

- Create two-way channels of communication both to deliver and listen to science from users and practitioners, policy makers, extension specialists, NGOs
- Engage public on climate change and role of agriculture, resource conservation, food safety and security by hosting field days and hands-on workshops.

Status:

Russell Ranch Sustainable Agriculture Field Day sold out and attracted over 120 students, faculty, farmers, extension and community members to discuss Biodiversity in Agriculture.

Created UC Davis Dried Tomatoes from 50,000 pounds of tomatoes grown at Russell Ranch. These will be offered for sale at the UC Davis Bookstore, Dining Services, Coffeehouse and UC Davis Medical Center. This is the second year Russell Ranch Roasted Tomato Sauce was prepared by the UC Davis Dining Service. It now is available at the Dining Service, on campus catering menus, and at the Gunrock Pub at UC Davis.

Student Farm – provides undergraduate and graduate students with experiential learning including sustainable production practices, applied research and outreach; includes Children's Garden Program for K-12 students and teachers. The Student Farm continues to thrive, but additional funding is needed to realize significant upside potential.

Status: In response to increasing student participation in Student Farm activities and higher levels of knowledge, skills and interests on the part of many of these students, the Student Farm launched a program planning and development project in early 2011. In the spring, a group of 10 student volunteers worked, with facilitation and support from a consultant, to gather input from students about their perceptions, experiences, needs, and interests. Student Farm staff began to implement changes in response to this input during the summer. These changes focus on: improving communication within the SF programs and activities; clarifying student roles, opportunities and requirements; and, strengthening the student community, particularly the ties between different Student Farm programs. To help guide and implement some of these changes, two students have been hired: an undergraduate student to help with community building and a grad student (who was hired with funding from True North Foundation) to strengthen student learning opportunities at the Student Farm. Within the Student Farm's program planning and development process, emphasis has been placed on developing and refining several student leadership positions and pathways.

More broadly, ASI-affiliated faculty and staff also are collaborating with interested students, faculty, staff and administrators to develop academic programs for a campus 'sustainable living and learning community' in the Student Farm neighborhood. ASI-affiliated faculty and Student Farm staff helped develop the program vision for the campus Sustainable Living and Learning Community and develop on- and off-campus partnerships to support the creation of a renewed residential learning community adjacent to, and collaborating with, the Student Farm.

Other collaborations with diverse campus partners:

- Partnerships with campus Dining Services have been strengthened through joint educational efforts linking all phases of the campus food system and increased sales and marketing of Student Farm and Russell Ranch products.
- The Student Farm is collaborating with the innovative D-Lab at UC Davis on project-based learning opportunities where sustainable agriculture meets appropriate technology.

Collaborations with primary and secondary schools and regional food producers:

- Student Farm staff are leading a project with on- and off-campus partners that provides diverse learning experiences for traditionally underrepresented high school students that increases their awareness of, and interest in, college studies and careers in sustainable agriculture and related areas.

- *Student Farm's Children's Garden Program staff are collaborating with statewide partners on a new CDFA Specialty Crops program-funded project focused on training both educators and trainers of educators involved in developing and using school garden programs.*
- *These staff also are part of statewide team that provides training and support for school food service, nutrition, teachers, garden educators and farmers on using and promoting fresh fruit and vegetable consumption in schools.*
- *Children's Garden Program staff continue to lead a collaborative Farm-to-School project focused on increasing procurement of regional produce, professional development, and assessing program effectiveness in three distinct northern California school districts.*
- *The Student Farm is contributing to the Center for Land Based Learning's beginning farmer program, helping identify needs and develop the curriculum.*

Bachelor's degree in Sustainable Agriculture and Food Systems – ASI will host a new interdisciplinary undergraduate major, bringing liberal arts and experiential education principles into undergraduate agricultural sustainability education; core courses are offered by ASI-affiliates; governed by a committee of department chairs. Current funding formulas are not sufficient to implement this innovative major and additional resources are needed. Grants in 2008 from Columbia and Heller Foundations provide significant startup funding. *Status: the Sustainable Agriculture and Food Systems (SA&FS) undergraduate bachelor of science degree received final approval in June, accompanied by great interest from students, the media, and the general public. UC Davis students can now transfer into the major. The major is governed by a council of nine CA&ES department chairs, who meet at least once per year. It is hosted by ASI, which also hosts the internship program that is integral to the major. The Department of Human and Community Development provides the administrative home and the academic advisor. The master advisor and faculty advisors for each of three tracks are ASI-affiliated faculty. To date, 8 continuing students have declared the major and a further 12 are in process. The major is open to incoming first year and transfer students for the 2012/13 academic year. We anticipate that the first Van Vlierden Endowment Scholarships will be awarded this year. With a grant from USDA, we are collaborating with several partners to recruit diverse students to the major.*

PhD in Agroecology and other graduate courses – ASI will support rejuvenation of this established area of emphasis within the top-ranked Ecology Graduate Group. Efforts also are underway to design a new graduate seminar on food systems to be offered through the Community Development Graduate Group. Enrollments currently are low in the agroecology area of emphasis. There has been great growth in interest in food systems among Community Development masters students. Funding for graduate student fellowships can attract new, high-caliber students, who will contribute to ASI

research and education activities. Preliminary inquiry in 2009 found that “agroecology” is studied in a range of graduate groups at UC Davis and is not confined to the Agroecology Area of Emphasis. Needs of the broader group include Web presence and activities (intellectual and social) to convene students and faculty, both of these needs can be addressed by ASI. This also suggests that the process to identify recipients for the annual Shapiro Family Award for Best Agroecology Dissertation also needs to reach out to students (and their advisors) beyond the Ecology Graduate Group.

Status: ASI Deputy Director Kate Scow became chair of the Agroecology area of emphasis in June 2011 and ASI-affiliated faculty member Johan Six agreed to continue service as graduate advisor.

The inaugural Shapiro Family Award for best dissertation in agroecology (or a related field) was awarded to Amanda Hodson, who completed her PhD in Entomology in 2010.

UC Davis graduate student Kelly Garbach became the first recipient of the annual Eric Bradford and Charlie Rominger Agricultural Sustainability Leadership Award. USDA Deputy Secretary Kathleen Merrigan spoke at the ceremony and presented the award in May.

Also at the graduate level, two new seminars on Food Systems Analysis and Food System Assessment were developed in response to student requests and were offered winter and spring 2011. The Food System Assessment class created an ongoing relationship with a local community partner—the Yolo County Food and Agriculture Alliance.

UC Davis Students for Sustainable Agriculture (SSA) – a campus student group working to promote agricultural and food system sustainability in academic programs and campus operations; includes about 10 leading members and 320 members of the community through listserv. Although not officially part of ASI, SSA’s activities include working closely with the ASI director, the director of our Student Farm and other staff to provide input from student perspectives and to facilitate liaison with other students at UC Davis.

II.3. People (See Appendix 3 for ASI personnel list)

Twenty-four staff (full- and part-time), including a five-person core support team serving ASI, SAREP and all affiliated facilities and programs and **four postdoctoral fellows**. ASI typically employs **6-8 graduate student researchers and 5-15 undergraduate assistants** (all part-time). *Status: As shown in Appendix 4, our core staffing levels increased incrementally over the last year. This mainly reflects change in status of two field workers at Russell Ranch, who were appointed as permanent employees (with full benefits including health insurance). For many years, these two*

men had been employed as temporary laborers through a farm labor contractor. This improvement in their status also reduces Russell Ranch costs. Our grant funded staff has increased by 5 FTE to support new grant projects initiated this year.

Nine ASI-affiliated professorships, including Kellogg Chair in Sustainable Food Systems (T Tomich), Boswell Chair in Sustainable Management of Soil Resources (W Horwath), and Sesnon Chair in Sustainable Animal Systems (E Kebreab, starting December 2009) and other affiliated faculty in agroecology (J Six), sustainability and society (R Galt), economics of sustainability (P Merel), plant disease management/soil microbiology (J Leveau), invertebrate community ecology (L Yang), and pollination ecology (N Williams).

Other ASI-affiliated faculty. *Status: Criteria, privileges, and responsibilities for appointment of additional ASI Fellows have been agreed. Fellows of the Agricultural Sustainability Institute will recognize faculty who are significantly engaged in ASI activities and will be chosen by the ASI Director.*

II.4. Annual funding:

We estimate that the total core funding from CA&ES and ANR for the current fiscal year (2011/12) will be \$760,405. Because of the CA&ES Dean's decision to allocate \$198,000 from the Bixby Endowment to the base budget for our Student Farm (see Section III.5 for further information), this level of support is comparable with \$978,943 in 20010/11 and \$964,544 in 2009/10. Although the Russell Ranch budget from CA&ES was cut 6% (about \$14,000) this fiscal year (the same rate as all CA&ES departments), the Student Farm budget was spared these cuts because of the Dean's decision to fund the base budget of the Student Farm from an endowment. Our ANR budget for SAREP will remain the same as last year, which is good news.

We also project total annual funding for ASI will exceed \$3.2 million for 2011/12. This is the first time ASI's budget will exceed \$3 million, which includes yearly income from gifts and endowments, expenditures from grant funding, and earned income from operations at the Student Farm and the Russell Ranch Sustainable Agriculture Facility. Note: These budget figures do not include salaries of ASI affiliated faculty.

Please see Section III.5 below and Appendix 5 for additional financial information.

III – STRATEGIES FOR ACTION

How ASI works

III.1. Priority Setting and Accountability

ASI is building institutional capacities to look ahead a decade or more to anticipate big issues and to develop and revise a dynamic agenda for sustainability science research, education, and action. By design, ASI's mission and vision for change are too broad to work on all elements at once. Thus, a strategic, proactive approach to priority setting is necessary to create themes and activities that are appropriately focused, that are feasible to pursue with available human, institutional and financial resources, that remain true to ASI values and operational principles, and that result in a cumulative process that enhances science-based understanding and action for sustainable agriculture and food systems. Mechanisms for accountability to ASI's stakeholders are fundamental to ensuring the legitimacy of ASI's evolving agenda and the usefulness of our products. ASI is working to establish and maintain a range of communication channels that will create meaningful roles for stakeholders in identifying sustainability challenges, shaping priorities, collaborating to find practical solutions, and providing feedback on our results.

Engagement with stakeholders

- **External Advisory Board.** The main purposes of our external advisory board are to advise the ASI director on strategic directions and priorities for action and to assist in identifying resources to accomplish our mission (see Appendix 9). The board also is expected to help ASI maintain and enhance communication channels with diverse stakeholder groups to ensure that ASI programs are directly addressing the needs of specific groups and society as a whole regarding sustainability of agriculture and food systems. To this end, ASI's external advisory board is structured to reflect a wide range of differing perspectives and is drawn from leaders in their respective fields, including farmers and ranchers; agricultural, environmental, and community organizations; food manufacturers and retailers; educators; policymakers; and the media. Student input is represented on this board as well as on internal advisory committees through "Students for Sustainable Agriculture," a campus based organization. This board also serves the functions of SAREP's Program Advisory Committee. The inaugural board will serve for terms of two or three years. Additional board members can be designated as needs and opportunities arise. Board meetings will be convened at least once a year, with other means (e.g., email, conference calls) used as needed to seek advice and input between meetings. A three-person subcommittee of the advisory board, including the board chair, has been established as an executive committee to provide more frequent strategic advice to the director, as needed. In line with suggestions at the inaugural Board meeting in 2008 and with a recommendation of the SAREP external review that year, two new advisory board members were recruited to better represent perspectives from UC Cooperative Extension.

Roles of board members. Roles of board members were outlined (Appendix 9) and finalized during the inaugural advisory board meeting in 2008. Ideas regarding the strategic roles of board members that were discussed include: (a) providing feedback, ideas and advice; (b) connecting ASI to new constituencies and resources; (c) staying aware of the difference between their roles as external advisory board members and, in several cases, their roles as ASI partners; and (d) bringing multiple perspectives.

Status: A gradual process of transitions has begun this year, with some new members joining and some founding external advisory board members completing their service. Departing board members will be designated “board emeriti” and we look forward to their continuing involvement with ASI.

- **Online surveys.** ASI has launched a Web-based survey initiative to provide for large-scale stakeholder input and to create a first-cut for identification of priority issues for sustainable agriculture and food systems in CA. Results of the 2008 online survey (Appendix 14) have informed development of our portfolio of initiatives.
- **Consultation.** Our new communication strategy will enable us to take a more systematic approach to our ongoing process of consultation and engagement with stakeholders.

Scientific input to priority setting processes

- **Scientific assessment for priority setting.** Scientifically-validated indicators will be developed for use by many stakeholders to benchmark trends in sustainability in California’s agriculture and food system. These indicators will reveal where there has been progress toward sustainability and where there are problems; whether there are tradeoffs across sustainability objectives; which strategies and responses can be most effective in addressing problems and balancing tradeoffs; and where knowledge gaps matter most. Creation of the set of indicators also will create capacity to monitor changes, assess risks, and anticipate emerging sustainability challenges and opportunities. In addition to providing the scientific foundation for an operational definition of “sustainability” for California’s agriculture and food system, the sets of sustainability indicators will inform ASI priority setting and could contribute to development of agricultural sustainability standards and a long-term strategic vision for the future of California’s food system.
- **Monitoring, evaluation, and impact assessment.** To establish an adaptive, learning organization that can effectively incorporate lessons from experience, ASI needs to develop, implement, and institutionalize processes that monitor and evaluate the quantity and quality of our outputs and that assesses outcomes and impacts on our goals. Some relevant mechanisms are in place in SAREP, but much more needs to be done over the years ahead to create a learning organization. (Also see Section V below, Indicators of Success.)
- **International board of science advisors.** To ensure that ASI’s agenda is on the cutting edge of sustainability science, experts in this field have suggested that ASI

institutionalize periodic input (perhaps every 2-3 years) to the director from a network of international scientific leaders. Thanks to the Packard Foundation, input of this type was obtained in development of a major proposal; that experience proved very valuable and suggests this should be developed further in the future.

III.2. Interdisciplinary, integrative activities

ASI will lead and manage interdisciplinary, integrative activities that cannot be undertaken effectively within academic departments. ASI will focus and integrate research, education, communication and engagement activities across its evolving agenda and update and adapt these activities as understanding develops in all dimensions of sustainability of agriculture and the food system—plant and animal science, environmental and natural resource stewardship, social and economic issues.

- **Research.** ASI assembles and coordinates interdisciplinary teams to design, seek funding, and implement major sustainability science projects, hosted and managed by ASI. These research projects have the primary goal of identifying scientific principles and practices that enhance sustainability of agriculture and the food system. Priorities include (a) identification of emerging, scientifically-valid innovations and help move them from the margins to the mainstream, (b) coordination and support for long-term research, and (c) knowledge management to ensure that research methods, protocols, and results are archived, synthesized and made available for use by other researchers. For details, see sections IV.1, IV.2, IV.4.
- **Education.** ASI supports programs to educate students of any age, professionals, and the public regarding science-based sustainability principles and practices, exposing them to a variety of ideas, practical experiences, and divergent viewpoints on questions that remain controversial. For details, see section IV.3.
- **Grantmaking.** SAREP grants are a top program responsibility and a key ingredient in building support for sustainable agriculture and food systems activities. SAREP will refocus its activities on grants for agricultural sustainability and food system research and education and on information dissemination. These grants may take a variety of forms, including (but not limited to) both competitive grants and targeted “academic venture capital” grants for new initiatives. For several years, lack of funds has precluded an effective grant program. As a result, current problems include both lack of sufficient size to attract attention and unreliability from year to year, which also affects the number and quality of potential grantees.

Status: 14 SAREP projects were funded totaling \$150,000 in 2011. They include 1 research grant (farmworkers), 5 planning grants, 5 education and outreach grants and 3 graduate student awards.

- **Communication, translation and dissemination.** ASI will produce and disseminate science-based information that responds to stakeholders' needs and will improve sustainability of agriculture and the food system through uptake and use by a diverse clientele, including all segments of agriculture across a diversity of scales and systems, agricultural labor and rural communities, and bridging the rural-urban interface. Fenton Associates submitted their recommendations for ASI's communication strategy in February 2009. *Status: A new communication coordinator was recruited in 2011.*
- **Distinguished speakers and seminar series.** Graduate students and faculty have expressed interest in a regular series sponsored by ASI, which could serve as a means to bring colleagues together for stimulating, rewarding, and enjoyable exchanges of ideas at the forefront of sustainability science. The series was inaugurated with a seminar by Professor Jules Pretty of the University of Essex, speaking on "Sustainability and the State of the World Food System" on 3 November 2010.
- **Meetings, conferences, symposia and other events.** ASI hosts a variety of scientific and social events, providing forums for stakeholder consultations, formation of collaborative partnerships, and implementation of research education and outreach activities. ASI events will provide a "safe space" to convene people with differing (even conflicting) views, unveil controversy, deepen understanding, and to build consensus for action or support public discussion where no consensus yet exists. ASI has institutionalized "working agreements" to ensure interactions are based on mutual respect and is developing an active schedule of events that will accelerate now that the two SAREP academic coordinators are recruited. ASI will continue to receive backup support from staff of the CA&ES Dean's office for some events.

III.3. Leadership, collaboration, and coordination

Internal accountability and coordination

Strategic planning, budgeting, and implementation of activities of ASI, SAREP and other ASI units are coordinated within an overall vision, mission, and strategies in order to enhance effectiveness of current programs and of new initiatives. Principles that guide these processes include subsidiarity (delegation to the level of most effective management and decision-making); transparency; and mutual accountability. Now that key recruitments are completed and our team is in place, we are planning training to create a "high performance team," including enhanced abilities to work effectively in distributed, multi-disciplinary, culturally-diverse teams; to build and maintain internal capacity to facilitate such teams; to leverage team members' creativity and problem solving capability; to relate effectively with diverse external partners; and to value the diverse contributions from various team members, units and partners.

- **Accountability to UC Davis College of Agriculture and Environmental Sciences (CA&ES) and UC Division of Agriculture and Natural Resources (ANR).** The ASI director also serves as SAREP director and reports to the Dean of CA&ES and the Vice President of ANR. A memorandum of understanding between CA&ES and ANR (see Appendix 11) delegates management and administrative support of SAREP to CA&ES.
- **ASI/SAREP core support team.** All core support team positions serve ASI as a whole in order to achieve synergies in strategic planning, priority setting, stakeholder engagement and accountability; budgeting and financial controls; fundraising and proposal preparation, and grant management; communication and public awareness; and monitoring and evaluation.
- **Internal steering committee.** This group includes ASI unit heads and academic coordinators, members of the core support team, affiliated faculty, and student representatives. The committee exists to facilitate synergistic communication, cooperation and collaboration among ASI programs and projects. It focuses on the day-to-day operation and management of ASI and affiliated units. Meetings are open to all staff and agendas typically are distributed in advance. The committee meets as needed, typically about once every six weeks.

Collaboration and coordination with students, faculty and cooperative extension

ASI seeks to bring people together across all divisions of the College of Agricultural and Environmental Sciences at UC Davis, from other UC campuses, UC Cooperative Extension (UCCE), and with other partners across the State of California. These talented people do not need more meetings for meetings sake. As with any of our partners, we strive to respect their time and believe that people respond favorably to collaborative opportunities with clear purposes, real chances for useful results, and that are stimulating, rewarding, and enjoyable.

- **Recognition and awards for leadership and excellence in interdisciplinary, integrative science.** Professional recognition and rewards for interdisciplinary, integrative research, education, and engagement with stakeholders are inadequate in comparison to more conventional academic pursuits. ASI can help redress this imbalance by creating appropriate incentives (awards, prizes, other forms of recognition) for students, faculty, and UCCE colleagues who demonstrate particular leadership or promise of excellence. Mentoring of junior colleagues is another important area for greater attention. Currently, ASI administers two awards: the Eric Bradford-Charlie Rominger Sustainability Award for uncommon leadership in the field of sustainability and the Shapiro Family Award for Best Agroecology Dissertation, in recognition of research excellence.
- **Student Advisory Committee.** This group draws on the Students for Sustainable Agriculture (SSA) group, an informal group on the UC Davis campus, and was formed

to provide input to the director regarding undergraduate and graduate student concerns and ideas related to ASI and the environmental, economic and social relevance in sustainability education programs. In addition to SSA, there are college-based student groups throughout California and it is hoped that SSA can assist in engaging with other campuses. Opportunities for student engagement include representation on ASI board, participation in search committees, and co-sponsoring of social events and speakers with Students for Sustainable Agriculture (SSA).

- **Faculty.** In a survey conducted a few years ago, approximately 150 UC Davis faculty members identified themselves as strongly interested in sustainable agriculture. This likely understates interest on the Davis campus and does not include faculty on campuses elsewhere in California, including other UC campuses (especially UC Agricultural Experiment Station faculty at UC Berkeley and UC Riverside and also our colleagues at UC Santa Cruz); California State Universities, community colleges, and other institutions where collegial relationships exist, such as Stanford and Santa Clara. We have been experimenting with different approaches tied to specific opportunities (e.g., requests for proposals) and need to continue to develop our repertoire for engagement and follow up with colleagues on the UC Davis campus. The director hosts dinners for ASI-affiliated faculty two-three times per year and these have been well received by participants. The deputy director for ASI is a CA&ES faculty member and advises the director on CA&ES linkages and issues, including involvement with the other ASI-affiliated faculty positions designated in CA&ES. The director is in frequent contact with counterparts at UCSC and has participated in events at UCB and UCR, but much more time will be required to develop full potential for faculty engagement to tap into talent across California.
- **Collaboration with other UC DANR statewide programs and centers.** ASI has established relationships with faculty and UC statewide programs working on complementary issues (e.g., Agricultural Issues Center, the Small Farms Program, and the Statewide Integrated Pest Management Program).
- **UC Cooperative Extension specialists and farm advisors.** SAREP has built working relationships with a number of UCCE specialists and county-based farm advisors (who in total comprise over 400 UC professionals across the state) through support for collaboration among county, regional and campus-based researchers. Competitive grants are one means to build collaborative links across organizational boundaries, but working groups, communities of practice, collaborative proposals and symposia are other means to that end. Through active participation in various ANR initiatives, workgroups, programs and events, we seek to broaden and strengthen relationships between ASI/SAREP and UCCE. Adding two UCCE professionals to the external advisory board also was a step toward greater statewide collaboration.
Status: It is anticipated that a new category of Agricultural Experiment Station Affiliates of ASI will be created, with the CA&ES Dean's Office, and linked to the SAREP Solution Centers, recognizing UCCE specialists and advisors who contribute significantly to project design, development of science-based materials, and service as technical interpreters, resource people, and network facilitators.

- **Mechanisms for consultation and collaboration linking faculty, students and UCCE staff.** Regular interaction with numerous interested faculty and UCCE staff would be valuable to ASI as a means to communicate about activities, assess needs, collaborate in development of new initiatives, and reflect on results; such contact is essential to fulfill SAREP's responsibilities. Particularly through leadership from our two SAREP academic coordinators, we have been effective in bringing together faculty and UCCE staff for specific purposes (e.g., responding to funding opportunities). On the other hand, plans for a "Faculty and UCCE Advisory Committee" were considered as a general means of communication and coordination, but seemed to be unworkable (too many meetings, no pressing purpose).

III.4. Communication and engagement

- **Statewide communication and engagement.** Other partners in California (e.g., Roots of Change and many of the types of organizations represented on the ASI external advisory board) play complementary roles with UCCE in our efforts to assist California's policymakers and communities (both urban and rural) in understanding and implementing sustainable food and agricultural systems and sustainable resource management. Selecting, building and sustaining key relationships with this complex set of implementation partners and potential end users (see graphic in Appendix 6) require a thoughtful and well-targeted strategy for communication and engagement.
Status: A new ASI/SAREP communication coordinator was recruited in 2011. She has begun implementation of key recommendations in the Fenton Associates report, with an emphasis on urgent requirements of the ASI website, including integration of SAREP webpages and exploration of server options for hosting SAREP databases.
- **National and international leadership, networking and collaboration.** California's reputation for innovation and leadership in agriculture and the environment is recognized nationally and internationally. The State's reputation in these areas is linked with the University of California. Thus, ASI is positioned to build on this recognition over time for impact that extends beyond California.
- **Leadership of the new Inter-institutional Network for Food and Agricultural Sustainability (INFAS).** The INFAS network was endowed by the W.K. Kellogg Foundation with a \$1.5 million gift in 2010. ASI hosts and coordinates INFAS, which is a national network of more than 24 academic leaders in sustainable agriculture and food systems, including directors of counterpart centers and holders of endowed chairs at land grant universities and other academic institutions across the US.
Status: recruitment of an INFAS network coordinator is underway.
- **Global connections.** The ASI Director and other UC faculty have extensive professional relationships internationally that will provide the basis for an envisioned international network of leaders in sustainable agriculture and food systems. *Status:*

ASI launched its first global project with \$875,000 from Mars Inc. to develop a framework for indicators of environmental, social, and economic sustainability of crops and raw materials being sourced by global food companies. This project will engage representatives of multiple stakeholders in global supply chains of key crops and livestock products and will coordinate closely with Mars' evolving sustainability initiative.

III.5. Fundraising

Fundraising will be a major preoccupation for the entire ASI team. Director of Major Gifts from the CA&ES Dean's office, our Communication Coordinator, Proposal Coordinator, and Budget and Finance Officer each play indispensable roles in providing support to the ASI Director, Deputy Director, Program Manager, Academic Coordinators, and faculty affiliates in these efforts. In addition to the team effort, implementation of our fundraising strategy must be supported by a compelling, socially relevant vision and mission, a results-oriented plan of activities, and an exciting strategy for communication, public awareness and engagement. Success also will depend crucially on active involvement and support from our advisory board members, UC leadership, and other friends and partners of ASI.

In broad terms, ASI's needs include reliable sources of funding to revitalize SAREP grants at levels of \$750,000 to \$1.5 million per year, and to fully-fund essential activities of the Student Farm, the Russell Ranch Sustainable Agriculture Facility, the new undergraduate major in Sustainable Agriculture and Food Systems, the Agroecology PhD, the National Symposium on Food Systems and Sustainability, and to implement ASI's vision, mission and strategies, described above. ASI is included in the pop-up menu on the "gift button" on the UC Davis Website (<http://giving.ucdavis.edu/>), enabling donors to make electronic donations to ASI. *Status: Please see Appendix 5 for data on annual income since fiscal year 2007/08 and Appendix 33 for information on our grant proposal submissions. Public documentation of our multiple sources of funding is available on our ASI website at www.asi.ucdavis.edu/about/funding. This information is current through fiscal year 2010/11 and the first quarter of FY 2011/12.*

For the coming 7-10 years, we are planning a campaign to pursue three ambitious fundraising goals (listed below) for ASI:

Goal 1. \$50 million in ASI endowments and philanthropic gifts and to increase ASI's total budget by \$4 million per year. This would be more than a two-fold increase from under \$2 million in 2007/08. The total increase would comprise about \$2 million for research, \$1 million for education, \$750,000 for staffing and operations, and \$250,000 for facilities and equipment. ASI benefits greatly from the income and prestige associated with several endowments, including the Boswell, Kellogg, and Sesnon

Endowed Chairs, and program endowments such as those from the Campbell Soup Company and the Van Vlierden Estate. In the medium term, ASI needs to replace a significant source of income from the Rosenberg Endowment (committed by CA&ES for 6 more years, at \$75,000 annually). Endowments are critical resources for building ASI programs. The reliability and flexibility of these significant flows of income is essential if ASI is to be proactive in setting the agenda for sustainability science and action rather than merely reacting to agendas set by others.

Status. The ASI endowment campaign nests within the university wide Campaign for UC Davis. As with any ambitious fundraising campaign, success for ASI is contingent on at least one “mega” gift of \$10-20 million. In the near term, ASI needs to fundraise for endowments to replace the Provost’s initiative funds at about \$40,000 annually, which is approximately equivalent to income from a \$1 million endowment. (We received our final allocation of the Provost’s funds in 2010/2011.) Within the next 6 years, an additional \$1.7 million endowment will be needed to replace the Rosenberg endowment funding mentioned above. Appendix 32 shows the cumulative value of ASI’s endowment gifts.

The importance of endowed funds has recently been made even clearer through the Student Farm. As of this fiscal year, the Student Farm’s funding is coming from a portion of the annual payout of the Bixby Endowment. The Fred H. Bixby Estate established this endowment to support practical agriculture at UC Davis. Proceeds from the Bixby Endowment have been supporting UC Davis for many years. The annual payout of about \$198,000 newly allocated to the Student Farm roughly corresponds to \$4.4 million of the total endowment, which currently is valued at over \$10 million. Because of the stability of the endowed fund, the Student Farm was not subject to the budget cuts that affected other college programs and facilities. So, although this does not increase the level of Student Farm funding, the endowment allocation significantly reduces budgetary risk, increases predictability in program planning, and also signals an enduring commitment by CA&ES. The reallocation of the endowment proceeds to provide core support for the Student Farm is thanks to the efforts of Dean Neal Van Alfen.

Goal 2. Secure two or more large program grants each year, totaling \$1 million or more. Criteria for allocation of ASI resources to development of grant proposals include: (a) a “champion” steps forward to lead development and writing of the proposal, (b) proposed project is interdisciplinary and will allow ASI to draw in faculty across departments, (c) fit with ASI’s thematic areas, (d) intellectual merit and potential contribution to ASI’s research, education and outreach programs, (e) potential for connections across the University of California and with other institutions, (f) potential for outreach and collaboration with external stakeholders, (g) significant funding amount, (h) acceptable requirements for matching funds, (i) likelihood of success, and (j) time and resources available to prepare a high-quality proposal. (These criteria are not prioritized.) We have an active and effective team, orchestrated by a half-time

proposal coordinator, to support efforts by faculty and other partners to produce high-quality proposals for competitive extramural grants.

Status: Our new half-time proposal coordinator began working in January 2010—numbers show the renewed increase in ASI grant activity: 13 of 18 project grants were awarded in 2010/11, totaling \$1.36 million. These awards include a \$498,000 award from the CDFA Specialty Crop Block Grant program, a \$464,000 award from the USDA Higher Education Challenge grant program, and six awards falling between \$50,000 and \$75,000 from a variety of public and private funders. Also worth noting are the 5 grants we did not receive which represent a potential \$4 million in program funds—showing ASI's willingness to pursue larger and more competitive grants. Four months into fiscal year 2011/12, ASI already has had 6 successful grant proposals totaling more than \$360,000, with many more opportunities in the months ahead.

Goal 3. Sustain UC support at \$750,000 per year. Despite continued cuts and uncertainty in the overall budget situation, leadership from the CA&ES Dean's office and the UC DANR Vice President's office has helped ASI maintain core funding. Continuing support signals strong commitment by CA&ES and ANR to our agricultural sustainability initiatives and, as such, these are powerful assets in our fundraising efforts in addition to being the foundation for the viability of ASI.

Status: The crisis in California State funding since 2008 has meant it was not possible to sustain UC support (from CA&ES and ANR) above \$1 million per year. SAREP's base budget from UC DANR was cut 20% (approximately \$100,000) in fiscal year 2009/10 (proportional to the overall cut faced by DANR), but it is a pleasure to be able to report that ANR has been able to continue the same level of funding for SAREP in 2010/11 and there is reason for optimism that this funding may stabilize going forward. Although the Russell Ranch budget from CA&ES was cut 6% (about \$14,000) this fiscal year (the same rate as all CA&ES departments), the Student Farm budget was spared these cuts because of the CA&ES Dean's commitment of about \$198,000 from the annual payout of the Bixby Endowment to funding the base budget of the Student Farm (discussed above under Goal 1). Because of this mix of changes, it seems appropriate to recast Goal 3 as "Sustain UC support at \$750,000 per year" (from the original goal of \$1 million).

IV – THEMES, INITIATIVES, AND CURRENT WORKPLANS

Next Steps for ASI work

Overall status: the current thematic structure and priorities for ASI initiatives seems to be working well, though it will be some time before ASI has resources sufficient to pursue all proposed initiatives. *Status: blue text below indicates 2011/12 work plans.*

IV.1. Agriculture, Resources and the Environment Theme

Energy and Climate Footprinting

- Complete and submit a journal publication on processing tomato life cycle assessment (LCA) study
- Revise and re-submit papers on rice and honey LCA studies
- Complete pistachio LCA study
- Continue research on almond LCA study
- Develop web-based products for this initiative

Responding to Climate Change

- Provide science-based advice to California Climate and Agriculture Network (CalCAN)

Sustainable Management of Nutrients and Water in Agricultural Landscapes

- Complete the California Nitrogen Assessment report, with review process
- Begin outreach activities for the Nitrogen Assessment
- Advise the California Agricultural Water Stewardship website revision and re-launch

Closing the Loop: Integrating Sustainable Waste Management in Agriculture

- Develop concept and outline a prototype Solution Center for re-purposing agricultural waste materials and engage with relevant stakeholders and end-users for input

Harnessing Ecosystem Services to Increase Agricultural Sustainability

- Develop biological alternatives to chemical spraying of weeds by establishing grassland research on fallow plots of main experiment and collaborating with UC Davis facilities to develop landscape-scale plan for establishment of hedgerows and corridors to increase biodiversity and reduce herbicide costs.
- Establishment of overhead sprinkler demonstration/research plot with extension, industry, and Russell Ranch to explore new irrigation technologies.
- Expansion of soil moisture sensor network in main plots and develop research questions to guide monitoring plan.
- Develop strategy to secure long term funding to support Russell Ranch project infrastructure and equipment needs and to offset recent budget reductions.
- Plan for meeting with leaders of other long term agricultural research facilities (Rothamsted, Kellogg LTER, Morrow Plots) to discuss collaborative network.

IV.2. Food and Society Theme

Building Regional Markets and Communities

- Organize evaluation research and outreach for 5 farm-to-school projects
- Write overview of Farm to School movement history and current development
- Organize research and outreach for Food Hub project
- Finalize reporting and outreach for Farm to Hospital project
- Organize and oversee 4 workshops for Small-scale, Latino and Hmong farmers

Community Food Security: not a major emphasis this year, except as it is part of the other initiatives.

Food System Assessments/ Food Policy

- Conduct food system assessment as part of Central Coast Ag Network's Urban Farm project in San Luis Obispo
- Create partnership with Ag Innovations Network to work with communities on food system assessments across California
- Continue food system assessment methodology outreach

IV.3. Education and Leadership Theme

Post-Secondary Experiential Learning and Formal Post-Secondary Education

- Continue Student Farm program planning and development process, particularly:
 - improving communication within programs and activities
 - strengthening the student community, particularly among Student Farm programs
 - developing new structures for Student Farm interns and employees
- Continue developing the Sustainable Agriculture & Food Systems major, particularly:
 - the internship program
 - programs for student competency development, including portfolio courses
 - outreach and recruitment via events and web, social and print media
- Contribute to academic program development of the Sustainable Living and Learning Community.

Education for Primary and Secondary School Audiences

- Provide on-campus, hands-on educational programs in food, nutrition, agriculture and ecology to over 1700 regional primary school students.
- Provide on-campus field-based learning experiences for traditionally underrepresented high school students and increase their awareness of, and interest in, college studies and careers in sustainable agriculture and related areas.
- Develop and provide educational opportunities for primary and secondary school students to learn about scientific and cultural aspects of crop genetic diversity and varietal development.
- Develop and conduct train the trainer programs for school garden development and use statewide.
- Facilitate and study the development of Farm to School programs statewide through professional development, peer-to-peer programs, and program evaluations.

Cultivating Leadership in Sustainable Agriculture and Food Systems

- Manage reports and outputs from all funded projects. Work with selected projects to conduct further outreach.
- Identify 2012 winner for the Bradford-Rominger Sustainability Leadership Award
- Identify 2012 winner for the Shapiro Family Agroecology Award
- Recruit network coordinator for the Inter-institutional Network on Food, Agriculture, and Sustainability (INFAS)
- Secure major funding for definitive INFAS collaborative project.

IV.4. SAREP Grants and Crosscutting Initiatives.

SAREP grant program

- Manage reports and outputs from all funded projects. Work with selected projects to conduct further outreach.

Benchmarks for Food System Sustainability

- Hire personnel for Mars Sustainable Raw Materials Sourcing Project and work with Mars and stakeholders to identify key areas of project focus and begin background research in those areas.

Farmworker and Rural Community Well-being

- Finalize research agenda from Farmworker initiative and plan outreach strategies with consultant and advisory committee.

V - INDICATORS OF SUCCESS

Where are we going?

ASI's strategic plan, and particularly our vision statement, suggests a number of desired transformations within agriculture and the food system and institutional capabilities to be built within ASI. With input from our director, deputy director, academic coordinators, communication coordinator, and proposal coordinator, ASI's program manager is working to institutionalize monitoring and evaluation of various performance indicators, including measures of inputs, outputs, their uptake by partners, and ultimately studies of outcomes for our partners and impacts in the "real world".

We seek to develop monitoring systems that will serve several useful purposes: 1) focus our work on ASI's mission and priority goals, 2) guide adaptive management of our current projects and activities, 3) stimulate learning within our team and with our partners, and 4) provide compelling evidence of ASI's impacts for current and potential funders and other stakeholders.

We have begun working with evaluation consultant, Francesca Wright, to guide our development of a monitoring and evaluation plan. Based on meetings with SAREP's academic coordinators and Student Farm staff, we have identified a first draft of potential outcome statements and associated data collection methods for consideration:

1. ASI Builds Knowledge through Externally Funded Projects & SAREP-awarded Grants

- For internal learning, team members identify and share process insights at key points during and after projects. Track key learnings on shared written documents, including formulation, testing, and reframing of hypotheses.
- For external audiences, identify key findings and outcomes from projects; track and report via ASI web site, press releases, various reports, as appropriate.

2. ASI Distributes Knowledge

- Track staff presentations and publications (using MyInfoVault – on-line campus academic activity reporting system)
- Track media coverage
- Track web site use
- Track meaningful and significant external inquiries via simple on-line form. (Consider follow-up w/ email survey to clients.)
- Periodic email surveys to "customers" (e.g. Student Farm alumni, key strategic partners to document uptake)

3. ASI Incubates Leaders, Producers, Consumers and Advocates

- Track SA&FS graduates
- Track # of students participating in Student Farm activities. Consider follow-up w/ some.
- Track # of K-12 students & school district personnel trained in eco-garden trained.

4. ASI Collaborates with Strategic Partners

- Explore informal group process to document growing network of strategic partners every 6 – 8 months. (Large wall paper, post-its, color coding, photo recording.) Link with ASI contacts database.

5. ASI Leverages Resources

- Track external funding

The next steps in our planning process are:

1. Consultant will meet with a few more key staff, including our Russell Ranch director, to inform the next monitoring plan draft.
2. Staff will meet as a group with Program Manager and Consultant to discuss the theory of change (TOC) implied by the draft outcomes, and work together to identify indicators and potential data collection methods, and refine outcomes as needed.
3. Program manager will work with staff to define timeline, methods, and clarify roles and responsibilities for collection of monitoring data.

We expect our monitoring and evaluation plan to be a dynamic construct that we will adapt and improve over time. Since time is always a constraint, we'll be looking for ways to streamline data collection, and effectively use the support offered by our student assistants.

Lastly, our process should help us to evaluate how we are living up to our operational principles: practicing sustainability, legitimacy, usefulness, and the scientific credibility of our work.

VI – LIST OF APPENDICES

Appendices can be accessed at: <http://asi.ucdavis.edu/about/advisory-board/Board-meetings/2011-external-advisory-board-meeting>

Institutional Framework and Assets

- Appendix 1: Organizational Structure
- Appendix 2: Programs and Facilities
- Appendix 3: Personnel
- Appendix 4: Core Staff and Grant Funded Staff (2006/07- 2011/12)
- Appendix 5: ASI Annual Income
- Appendix 6: Stakeholders
- Appendix 7: Advisory and Accountability Structure

External Advisory Board Documents

- Appendix 8: External Advisory Board - Current Members
- Appendix 9: External Advisory Board – Purpose and Operation
- Appendix 10: Report from 3rd External Advisory Board Meeting, 9 December 2010

UC DANR Documents

- Appendix 11: MOU between UC DANR and UC Davis CA&ES
- Appendix 12: SAREP External Review documents
- Appendix 13: DANR restructuring documents

Themes and Possible Priorities

- Appendix 14. Results of the 2008 Online Consultation on Priorities

Education and Leadership Theme – Concept Notes

- Appendix 15: Experiential Learning for Post-Secondary Students
- Appendix 16: Formal Post-Secondary Education in Sustainable Agriculture and Food Systems
- Appendix 17: Education for Primary and Secondary School Audiences in Agriculture, Environment, Food & Nutrition
- Appendix 18: Cultivating Leadership in Sustainable Agriculture and Food Systems

Food and Society Theme – Concept Notes

- Appendix 19: Building Regional Markets and Communities
- Appendix 20: Community Food Security for Low-Income Residents
- Appendix 21: Food System Assessment/Food Policy
- Appendix 22: Farmworker Wellbeing

Agriculture, Resources and the Environment Theme – Concept Notes

- Appendix 23: Energy and Climate Footprinting of Food Production and Supply Chains
- Appendix 24: Responding to Climate Change
- Appendix 25: Sustainable Management of Nutrients and Water in Agriculture Landscapes
- Appendix 26: “Closing the Loop”: Integrating Sustainable Waste Management in Agriculture
- Appendix 27: Harnessing Ecosystem Services to Increase Agricultural Sustainability

Crosscutting Initiatives – Concept Notes

- Appendix 28: Benchmarks for Food System Sustainability
- Appendix 29: Farmworker and Rural Community Well-being

Communication and Fundraising

- Appendix 30: Our messages
- Appendix 31: Fenton Communications Strategy: Summary and full report
- Appendix 32: Fundraising Case for Support
- Appendix 33: Fundraising – ASI Grant Proposal Successes
- Appendix 34: Fundraising – Cumulative Endowments
- Appendix 35: Fundraising – Campaign Projections