

APPENDIX 11 –THEMES AND POSSIBLE PRIORITIES: BRIEF SKETCHES

Note: this is not a comprehensive list of current activities.

Crosscutting activity: Scientific Assessment for Priority Setting
(see section III.1)

Theme 1. Agriculture, Resources and the Environment: Management of our agricultural landscapes for social and environmental services they provide (soil and water quality, stable livelihoods, biodiversity, and aesthetic and spiritual values) as well as production of agricultural commodities (food, feed, fiber). This will require better understanding of spatial scales, the interfaces among ecosystems and their shared resources, and tradeoffs among different sets of management options.

Emerging priorities

- **Climate Change: Assessing Effects of Climate Change and Climate Policies on Land Use.** California's 'Global Warming Solutions Act' (AB32) will require new technologies to reduce greenhouse gas emissions and sequester carbon on farms, and in turn, farmers stand to benefit financially from the statewide cap-and-trade policy that is now being set in place. Farm fields and farm margins offer different options for compliance, e.g., woody crops, soil C storage, less fossil fuel use, and hedgerows. Over a longer-time frame, adaptation to higher temperatures, intermittent drought, and climate variation will be necessary, and this will be facilitated by programs that consider individual farms within a larger landscape, e.g., greater diversity at the landscape level may serve as a source of resilience. *Status: L Jackson led a multi-disciplinary team that completed a prototype study "Potential for Adaptation to Climate Change in an Agricultural Landscape in the Central Valley of California," funded by the State of California. ASI is seeking additional funding to extend this work statewide, including a prospect for Packard Foundation funding of a statewide assessment of carbon fluxes in agriculture.*
- **Climate Change and Water Quality: Reducing Nitrogen Pollution.** Nitrogen is the most important nutrient for crop production, and it is often over applied to California's specialty crops, because it is inexpensive in comparison to the total cash value of these crops. As a result, both surface water and groundwater in many aquifers are polluted at nitrate levels that exceed the public health drinking water standard. Also, microbial nitrogen transformations in the soil can produce a potent greenhouse gas, nitrous oxide. The mobility and transport of nitrate, nitrous oxide, and other nitrogen compounds is extremely high, so problems at the farm scale readily escalate to landscape level issues. There is a need for new technologies and novel socioeconomic approaches to deal with nitrogen pollution. *Status: Decisions*

pending from the Packard Foundation on funding for an Anchor Grant to ASI to conduct a California Nitrogen Assessment, in collaboration with two statewide programs (the Agricultural Issues Center and the Kearney Foundation for Soil Science) and two related project proposals. If funded, these will be a great boost to ASI work on agroecosystem assessment, climate change mitigation, and nitrogen science.

- **Water: Managing Water Conflicts and Increasing Water Use Efficiency on Farms.** California agriculture is highly dependent on both groundwater and surface water, especially in drought years, and water demand will increase with the expected increase in population. Coping with problems of water availability and water quality can be improved through networks and coalitions of various stakeholders in an agricultural landscape. More activity and demonstrations of effective systems for delivering water, recycling water, reducing runoff, and efficiently using water resources will require integration of research at both the farm and landscape levels. *Status: Water is emerging as the top sustainability issue for California agriculture, and is closely linked to climate change, nitrogen pollution and energy issues. Next steps will be to consult with other centers on the Davis campus and elsewhere in the UC and CSU systems to identify whether there is an appropriate niche for ASI.*
- **Other possibilities:** alternatives to methyl bromide; sustainable biofuels

Theme 2. Food and Society: This theme seeks to understand the inter-relationships in the systems of growing, distributing, processing and marketing food in order to improve supply to poorly served communities; Improve human nutrition; increase profitability for everyone working in food systems enterprises; improve stability in employment and income for food system workers; minimize energy use and reduce greenhouse gas emissions, and create more diverse market opportunities for small to mid-scale growers.

Emerging priorities

- **Local and Regional Food Systems: Building Markets and Communities to Support Small to Mid-scale Growers.** Consumers' desire for fresher and more flavorful foods, for more vibrant local economies, and their growing awareness of environmental problems, are creating demand for foods produced locally by small to mid-scale producers. This topic area focuses on building capacity (developing infrastructure) and increasing profitability in order to ensure a more diverse food system. *Status: Ongoing SAREP projects, often undertaken in collaboration with the statewide Small Farms Center. SAREP is conducting a Symposium in December 2008 to draw lessons from work so far and set priorities for future efforts.*

- **Local and Regional Food Systems: Linking Regional Agriculture with Schools – Farm to School.** Farm to school programs (that include fresh, local foods in cafeterias, school gardens, nutrition education/cooking and farm tours) have been shown to increase school children's consumption of fresh fruits and vegetables and promote healthy food choices. They also increase sales for local growers. *Status: An ongoing SAREP project, focusing on understanding how these new programs work best, how they might be scaled up and what impacts they have on the environment, farmers' incomes, and children's health. A parallel "Farm to Hospital" project is in development.*
- **Energy Intensity of the Food System: Carbon Footprint Initiative**
This topic area focuses on reducing the overall energy to grow, process and distribute food to the consumer. It will analyze direct and embodied energy use and carbon emissions from "farm to fork" to understand where attention should be directed (e.g. production methods, transportation, processing or home use) in order to support more sustainable alternatives. Using "life cycle analysis" to evaluate energy use allows us to gain a more complete picture of the environmental impacts of the food system. *Status: Major new area of SAREP activity. A state-of-the art review and international roundtable on methodology were conducted in 2007/08, followed this year by a white paper and planning for several case studies. Funding prospects are promising, but have not yet paid off.*
- **Other possibilities:** community food security (community and home gardens, and urban Farms); food safety; food labeling and certification standards.

3. Education and Leadership: Integrated programs for sustainability education and leadership from kindergarten through post-graduate levels.

Emerging priorities

- **Investing in our Children and Youth: Agricultural Literacy for Kindergarten through High School (K-12).** We will address our children's limited relationship with their food system and agriculture. We recognize that the current epidemic of health concerns is impacted by diet and lifestyle choices which may be influenced by interaction with an effective food system. The recent support in California for effective nutrition, environmental, and agricultural education, enhanced by instructional school gardens gives ASI an immediate opportunity to provide expertise to this effort. We will enhance agricultural literacy through hands-on education programs, development of resource materials, training for K-12 educators and strategic partnership building to direct limited resources. We expect to see vibrant and effective agriculture education programs and school gardens and that teach sustainable agriculture issues, promote deeper understanding of where food comes from, encourage healthful food choices, and bring about greater awareness of California's agriculture. This activity offers opportunities for partnership with community-based and land-based learning

initiatives. *Status: The Children's Ecological Garden and other Garden-Based Learning Programs are well established elements of the Student Experimental Farm. There appear to be very good prospects for expansion of these activities.*

- **Creating the Next Generation of Leaders: Integrative Education for Sustainable Agriculture.** There is a growing interest in, and need for, graduates who will help create and manage sustainable food and agriculture systems in the future. We will recruit and engage students through undergraduate and graduate courses, internships, research opportunities and degree programs that foster the development of knowledge and skills necessary to participate in solving complex agricultural and societal problems, emphasizing systems thinking, interdisciplinary analysis, experiential learning, collaboration, skill development and career exploration. *Status: Four core courses of the new undergraduate major in Sustainable Agriculture and Food Systems will be offered for the first time in 2008-2009. It is expected that the formal proposal for the major will be submitted early in 2009, with hope that it will be approved within 12-24 months.*
- **Useful Knowledge for Agricultural Professionals: Learning Opportunities and Communication Networks for Agricultural Professionals, Ag Program Leaders and Teachers to Address Issues of Agricultural and Food System Sustainability** To serve the need for enhanced educational opportunities and information sharing within the diverse professional audience of the ASI. We envision a range of services directed to the practicing agriculture professionals; farmers, ranchers and their workers, science and ag teachers (Future Farmers, 4H), PCA's and UCCE farm advisors enabling inclusion of broad based and fundamental concepts of agricultural sustainability into all levels of food production systems. We will work to develop resource support for existing teaching and educational programs, build communication and idea sharing networks, initiate grant proposal processes, and create seasonal "short course" experiential programs to be utilized by agricultural community. *Status: Pending results of SAREP external review and Fenton communications strategy consultancy.*
- **Raising Awareness of the People of California: Public Education and Outreach.** There is growing concern about the health and sustainability of California's environment and natural resources, particularly as they relate to agricultural practices and the systems that contribute to bringing food to our tables. Consumers are beginning to demand assurances that the food they purchase has been produced safely and with due consideration for potential negative impacts on the environment. At the same time, there is widespread confusion about the meaning of terms such as "sustainability," and "food systems." In order to make informed decisions, consumers as well as farmers, ranchers and other sectors of the public need scientifically valid and accessible information. This topic area focuses on developing and distributing information through a variety of means, including publications, on-farm demonstrations, workshops, symposia, and community outreach. We envision this

work as a dialogue with members of the public, through which new issues can be explored and new challenges met. *Status: Emerged as a stop priority in our web-based consultation. Decision on action pending results of SAREP external review and Fenton communications strategy consultancy.*

- **Networking National Academic Leaders, Policymakers and Journalists: National Symposium on Food Systems and Sustainability.** ASI will host a yearly symposium to build relationships and facilitate ongoing discussions among the nation's academic leaders in the areas of agricultural sustainability and food systems for the purpose of providing better-coordinated and more effective guidance to policymakers, practitioners, foundation leaders, and community advocates. *Status: The Inaugural Symposium will be held in Davis on 24 March 2009. The Kellogg Foundation has funded the inaugural event and second event planned for 2010; additional sponsorship is needed to sustain the series.*