

## **Crosscutting Initiative**

### **Sustainability Benchmarks for California's Food System**

#### ***Summary***

ASI is committed to creating a set of benchmarks that will measure trends in the sustainability of California's agriculture and food systems. This initiative will develop science-based indicators and other information that will be used to set agendas for ASI and other organizations involved in sustainable agriculture. These benchmarks can support the assessment of broader UC program priorities, and provide guidance on public policy alternatives. Specifically, this initiative could support the newly-announced UC ANR Sustainable Food Systems strategic initiative and the "California Agricultural Vision" initiative of the California Department of Food and Agriculture and the State Board of Food and Agriculture. This crosscutting initiative builds on activities already underway within ASI (e.g., the California Nitrogen Assessment, life-cycle analyses of energy and GHG intensity in the food system, and other food system assessments), and is intended to complement the Measures of California Agriculture (MOCA) project of the UC Agricultural Issues Center (AIC).

#### ***Problem statement / baseline***

Much work remains to be done to forge a broad consensus on the practical meaning of "sustainability" for agriculture or the food system. This is complicated by the fact that many of the social, economic and biophysical forces at the heart of these issues occur at spatial and time scales that far exceed those of conventional research and that data often are not reported at policy-relevant scales. Moreover, California and the US lag behind international practice in the application of integrated assessment methods to synthesize existing science in order to produce information in forms that are useful for decision-making on big, complex issues.

#### ***Structural issues / Broad drivers shaping change***

- The Millennium Ecosystem Assessment (MA; 2006) concluded that, over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any time in history. From 1960-2000, while food production more than doubled and food supply/capita increased almost everywhere (save sub-Saharan Africa), biologically-available nitrogen flows doubled in terrestrial systems and flows of phosphorous tripled. Over half of all synthetic nitrogen fertilizer ever used has been used since 1985.
- Interest in "sustainability" has increased dramatically since 2000, in part because of accumulation of empirical evidence in the MA and elsewhere regarding the significance of human influences on Earth's ecosystems. This is compounded by mounting scientific evidence of emerging sustainability challenges at the global scale, including prospects for disruptive climate change (Intergovernmental Panel on Climate Change IPCC 2007), regional water scarcity, continuing growth in human population through mid-century, and shifting patterns of demand driven by rising income in some regions as well as resumption of growth in absolute numbers of hungry people globally, a reversal of gains in recent decades.
- These global issues have parallels in our own state. The California Agricultural Vision ([www.cdafa.ca.gov/agvision](http://www.cdafa.ca.gov/agvision)) declares that "we must continue to blaze trails toward long-lasting sustainability and health. Challenges in obesity, diet related diseases, hunger, rising energy costs, a growing population, dwindling water supplies and a changing climate require our attention, and it is our responsibility [to] lead the way."

### ***Strategic opportunity***

Society's choices are shaped by politics, economics, culture – and knowledge. Generation and dissemination of knowledge about sustainability challenges and opportunities in agriculture and the food system can improve awareness and understanding in science, policy arenas, the private sector, and among the public. New organizational approaches – such as the IPCC and MA – have proven that these assessment methods can successfully link science and action on policies and practices.

An integrated assessment of California's agriculture and food system – modeled after successful international assessments – can provide a practical, science-based framework to organize data on sustainability trends. This initiative will advance understanding of the practical implications of sustainability, and will feed into ASI's efforts to address big, emerging sustainability issues in California's food system in a useful way. Identification and early action on these issues is central to ASI's mission.

### ***Desired outcomes***

- Greater **public awareness** of agricultural sustainability challenges and opportunities; **increased understanding** of areas where there has been progress and where there are problems; whether there are tradeoffs across objectives; which strategies and responses can be most effective in addressing problems and balancing tradeoffs; and where knowledge gaps matter most.
- A range of stakeholders with different values and interests can engage in science-based discussion, debate alternatives, and contribute to an **evolving consensus on the practical meaning of agricultural and food system “sustainability” in California.**
- An evolving science-based consensus could contribute to development of **agricultural sustainability standards, a long-term strategic vision** for the future of California's food system, and **new political coalitions in support of policies, programs, and other actions to enhance sustainability of California's food and agriculture.**
- **Capacity within the University of California** to monitor changes, assess risks, and anticipate emerging sustainability challenges and opportunities. Through links with global assessment networks, this initiative will foster a community of practitioners and promote knowledge exchange to put California in the forefront of assessment practice.

### ***Key partners***

Agricultural Issues Center, Kearney Foundation for Soil Science, UC ANR, UCCE.

California Department of Food and Agriculture, State Board of Food and Agriculture, other state and federal agencies.

California Farm Bureau Federation, various commodity groups.

Root of Change, NRDC, other non-governmental organizations.

Others to be determined.

## Activities

Using the conceptual model shown in the figure below, this initiative aims to undertake an integrated assessment of California's agriculture and food system, including development of a set of indicators that are both scientifically-validated as well as useful to researchers, the public and policy makers.

The cumulative development of this assessment over the coming years is intended to provide a practical, science-based framework to organize data on sustainability and, thereby, to tackle sustainability issues in California's food system. The initiative will:

- 1) Conduct regular consultations with a wide range of stakeholders to ensure the necessary focus on 'real world' issues and actionable opportunities.
- 2) Convene scientific working groups to analyze driving forces (for example, population and migration, urban/suburban expansion, climate change, price trends in energy and other commodities, technological change, changing consumer preferences, etc) and to assess available scientific data on conditions and trends for a comprehensive range of resources, products and environmental services from California agriculture.
- 3) Develop indicator sets comprising credible, useful knowledge to benchmark key dimensions of sustainability of agriculture and food systems in California.
- 4) Build capacity and provide an institutional home for a cumulative, continuous process of expansion, updating, quality control, synthesis and translation of sustainability benchmarks.
- 5) Draw on comparative experience nationally and internationally to expand understanding of best practices and broaden perception of workable alternatives.
- 6) Maintain reliable Web-based platforms and other media for widespread communication and dissemination of sustainability benchmarks and other assessment products.

As a starting point for the comprehensive assessment of California's agroecosystems, ASI (working with SAREP, AIC, and the Kearney Foundation for Soil Science) recently launched an interdisciplinary initiative to assess the tradeoffs involved in agricultural nitrogen management in California. Through collaboration with a diverse set of institutions and stakeholders, we will assess trends in nitrogen usage, evaluate priorities for research, policy, and action, and develop tools and information useful to farmers, ranchers, UCCE specialists and advisors, NGOs, and policymakers.

**Resources needed for 5 years** (apart from California Nitrogen Assessment and other ongoing activities):

Total need: \$ 1,000,000 (2 post doctoral researchers, one communication and engagement fellow)

Current funding: \$330,000 (income from WK Kellogg Endowed Chair)

Additional need: \$670,000

**Figure: framework for California Agroecosystem Assessment**

