

urban agriculture; the growing, preparation and consumption of whole foods in public schools and offering product life cycle impacts on food packaging. He also recommends shifting responsibility for federal nutritional advice from the USDA to the Surgeon General and encouraging the First Family to model the new American food culture through the use of seasonal menus, meatless meals and the establishment of an urban farm on the White House lawn.

Pollan's proposals draw on more than 30 years of intellectual inquiry, collaborative research and practical experience devoted to understanding sustainable food systems, and many of his proposals build upon existing local and regional models. Although there are some critical gaps in the agenda, particularly the lack of attention to food security issues and agricultural justice for farmers and food workers, the Sunfood Agenda offers us a credible vision of a sustainable and resilient food future and some practical steps to get us there.

Adding Resilience to the Menu

In the years since the Sunfood Agenda was proposed, a new awareness of climate change, coupled with the global financial and oil shocks, brought additional urgency to the quest for sustainable solutions. New federal programs, private donors and NGOs, research programs and publications in scientific journals and the popular press began to address agricultural and food system adaptation to climate change and other twenty-first-century resource challenges using the language of resilience science.⁴⁷ Major US cities and intrastate regions, several states and a number of multistate projects have worked to understand food system sustainability, assess the productive capacity of their food systems and develop plans to promote more sustainable and resilient food systems.⁴⁸ As experience and knowledge at different scales—from the local to global—began to accumulate, the regional scale emerged as the right size for a sustainable and resilient food system.⁴⁹

Regional Planning for Resilience

Regions have a number of qualities that, taken together, offer a unique opportunity for addressing food system sustainability and resilience.⁵⁰ Our natural understanding of the physical world is based on biophysical

patterns defined at regional scales, for example ecosystems and watersheds. Strong cultural dimensions often arise at a regional scale, and useful units for governance are often found there as well. A regional focus will typically include both urban and rural areas, offering an opportunity to include intra-regional interactions such as trade, development, population, transportation networks and other system elements that are likely to become more important as urban areas increase in significance in coming years. Finally, regional populations have influence at the national scale and through democratic participation have a voice in setting national policies and programs that can be used to create the operating conditions needed to promote a sustainable and resilient US food system.

Noteworthy regional projects exploring food system resilience in North America include those based in Iowa, Vermont and New England. These plans are among the first to articulate resilience as an objective and to develop the resilience criteria needed to support adaptive management of a sustainable food system.

The Iowa Food Systems Council (IFSC) engaged food system stakeholders across the state to develop a comprehensive approach for assessing food system resilience.⁵¹ Released in 2011, this innovative plan presents a sustainability and resilience assessment of the Iowa food system and recommendations for policy, program and research strategies that would improve the performance of the system on sustainability and resilience goals. The IFSC is currently preparing their first report card on the performance of the Iowa food system on the plan's indicators, though this work has been hampered by a lack of resources to complete regular updates as initially planned.⁵²

Also in 2011, Vermont's Center for Agricultural Economy released a comprehensive strategic plan designed to enhance economic development in the Northeast Kingdom region of the state through the growth of local food systems.⁵³ The planning process was based on a soil-to-soil, closed-loop food system model and is consistent with the goals of Vermont's Farm to Plate Investment Program.⁵⁴ The plan presents a practical and credible path to achieve broad sustainability and resilience goals for the Northeast Kingdom food system. Many of the

sixty targets (indicators) for assessing progress toward the plan's ten core goals enhance food system resilience: local provision of production inputs and recycling of farm and food wastes; support for diversified and profitable local production; development of infrastructure sufficient to supply year-round consumer demand for some food items; food system processes that serve to enhance environmental quality; agriculture and food system skills development; and local provision of healthy, fresh, affordable local food for all residents.



10.2. The “Soil to Soil” Food System Model⁵⁵

The “Soil to Soil” food system model is noteworthy because it extends the concept of the food system to include waste management. In this model, organic farm and food wastes are composted and returned to farms to improve soil quality or used to produce bioenergy. This is an important improvement in food system management, but still leaves out a large source of nutrient loss: human manure. Practical approaches to managing human wastes as part of the food system waste stream are controversial because of safety concerns and strong cultural barriers, but offer the potential for multiple economic, social and environmental benefits.

The urine-diverting dry toilet (UDDT) is a new approach to the problem getting a lot of attention around the world.⁵⁶ Without using any water, UDDTs separate urine from feces to facilitate recycling of both materials back to farmland. Vermont's Rich Earth Institute is conducting the nation's first formal experiment in community-scale nutrient reclamation using source-separated urine to fertilize hay fields near Brattleboro.⁵⁷



The New England Food Vision 2013 presents a detailed asset analysis of a sustainable and resilient regional food system in 2060. The vision aligns with four core values that place an emphasis on food security and sustainability: everyone has access to adequate food, everyone enjoys a

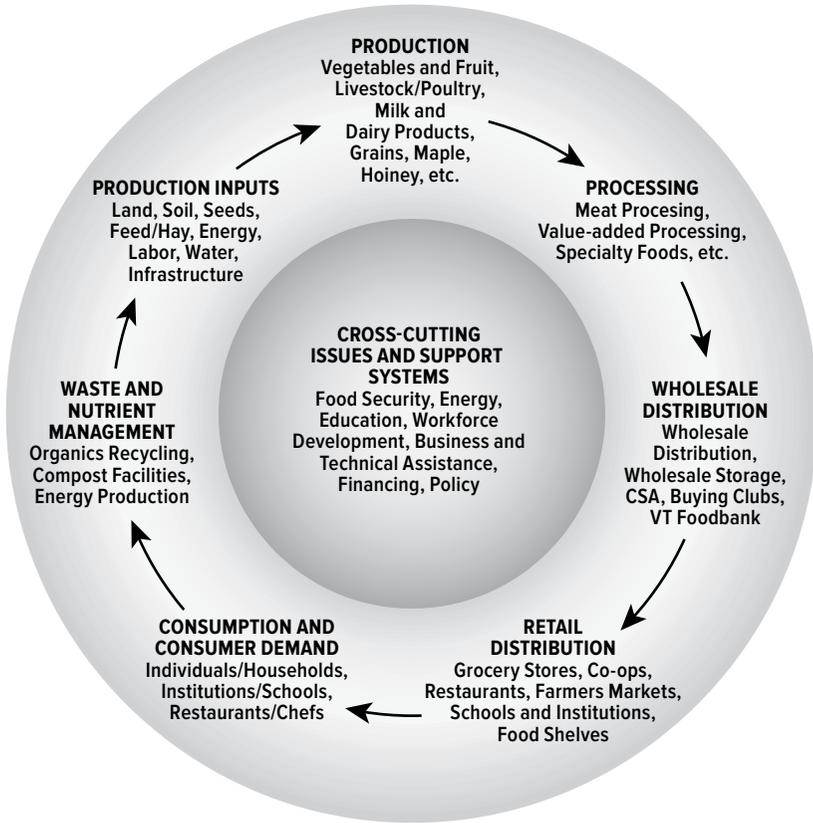


FIGURE 10.1. The “Soil to Soil” Food System Model. Credit: Center for Agricultural Economy

healthy diet, food is sustainably produced, and food helps build thriving communities. The New England Food Vision explores sustainable food production, including natural resource concerns relevant to energy and water resources, climate change and biodiversity and social concerns such as building food-system capacity and farm and food industries. Although it does not present a plan or performance metrics, the Vision does reference Vermont’s Farm to Plate strategic plan. A companion report⁵⁸ analyzes policy barriers and gaps associated with the Vision’s goal of increasing production and consumption of New England-sourced food and identifies policy changes to support expanding production,

strengthening food supply chains and enhancing multistate cooperation toward a more robust and resilient regional food system.

This recent work in regional food system planning offers a glimpse of a commensal food future by proposing models of sustainable and resilient food systems in answer to the question, “How do we feed ourselves in this place without harm?”

Cultivating Food Systems for a Changing Climate

What is the vulnerability of the US industrial food system to climate change? Thinking about this question raises more questions than answers: What are the main climate-related threats to North American food systems, both now and in the near future? What are the food system sensitivities to these threats? What is the adaptive capacity of our food system? How can our current understanding of food system sustainability and resilience contribute to effective climate change adaptation options?

While we are only now beginning to address these questions as a nation, our understanding of sustainability and resilience suggests that the US industrial food system does not have ecological or social response capacity to persist in a changing climate. A transformation of the system will likely be required to sustain the US food system into the 21st century. Can we find opportunity in the climate change challenge to cultivate a new kind of US food system? A food system that produces abundant, nutrient-dense food while restoring healthy natural resources and rebuilding communities? A food system that helps to mitigate global warming and protect us from weather variability and extremes while remaining productive in a changing climate?⁵⁹ What would such a food system look like?

The concept of the agroecosystem⁶⁰ can aid our visioning of a resilient US food system. Recall that, like the ecosystem, the scale and boundary of the agroecosystem is flexible and defined by the user. We can expand the concept of the agroecosystem beyond the individual farm to include the farm community, the region or even the nation and employ resilience criteria⁶¹ as a framework for regional food system assessment and design. Just as sustainable agriculture principles helped

us to envision a resilient agriculture, the principles of sustainable food systems help us to envision a resilient US food system.

A resilient and sustainable US food system will rest on a web of food systems embedded in a particular place, a civic agriculture defined perhaps by bioregion,⁶² watershed or metropolitan area. This New American Food System will support diverse food supply webs oriented to local and regional markets.⁶³ Resilience emerges through the diversity of linkages within and across multiple scales, from the local to the global, and the application of regenerative ecological principles and adaptive management strategies to food system design and development. Agricultural inputs, production, processing, distribution and sales are focused on regional markets, and food trade is limited to excess production and to a few specific products that are well adapted to the region.

Taking a cue from nature, these food webs will produce their own energy through sustainable energy systems and recycle wastes to close regional nutrient cycles. This food web will be less labor efficient and may be less land efficient, but it will be vastly more energy- and water-efficient. New measures of food system performance will value the production of fresh, nutrient-dense foods and the cultivation of ecological and social response capacity. This resilient food web will produce multiple environmental, social and economic benefits at the local and regional scale. Although many questions remain about how this system might evolve over time, we know enough, right now, to begin to cultivate a sustainable and resilient food system for a changing climate.



10.3. A Nationally Integrated Regional Food System

One proposal for the New American Food System envisions a redirection of resources toward the development of a nationally integrated regional food system.⁶⁴ Large metropolitan areas provide natural nodes for food systems focused on supplying regional food demands (see Figure 10.2).

Metropolitan areas present a unique operating environment with many benefits and some challenges to a sustainable and resilient agriculture.⁶⁵ On

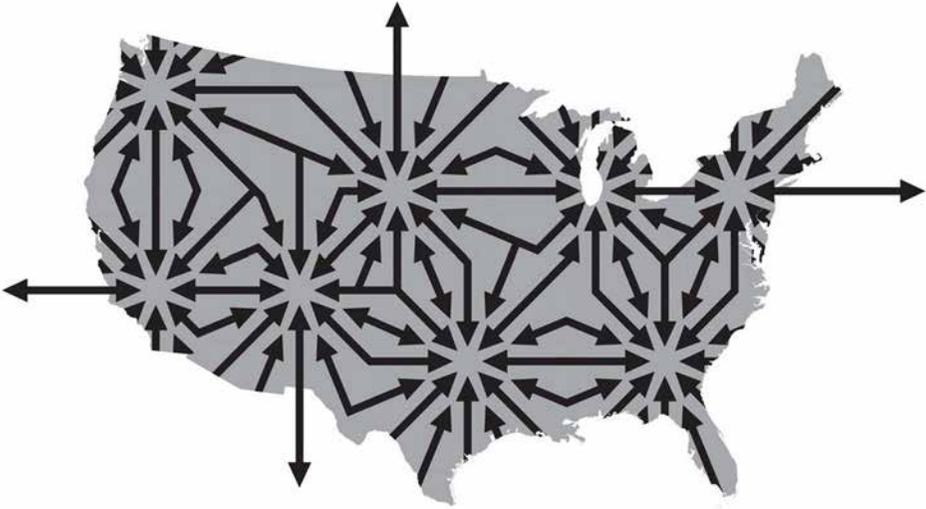


FIGURE 10.2. A Nationally Integrated Regional Food System Model. Credit: Urban Design Lab, Reprinted with permission.

the plus side, sustainable producers located in or near these areas have easy access to a large population of potential customers, high-value direct markets and value-added processing opportunities. Physical infrastructure for power, water, transportation and other resources is usually well-developed, and proximity to the metropolitan core offers opportunities for meaningful off-farm employment for non-farming family members. Metropolitan farming also presents some challenges. Land values are high, non-farming residents may object to farming operations, and access to traditional farm services may be difficult.

About 39 percent of all US farms are located in metropolitan areas; these farms account for about 40 percent of the value of US agricultural production. Metro farms have a different product mix than farms in non-metro areas; high-value crops and dairy products make up a larger share of their production, while cash grains and beef make up a smaller share. The top ten metro areas in order of population size:⁶⁶ New York, Los Angeles, Chicago, Dallas, Houston, Philadelphia, Washington DC, Miami, Atlanta and Boston.

