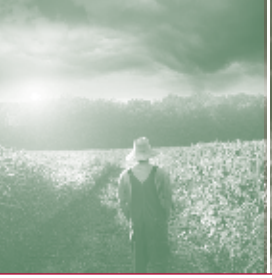
REBUILDING THE AMERICAN FOOD SYSTEM—
ONE HEIRLOOM TOMATO AT A TIME

Woodrow Wilson International Center for Scholars

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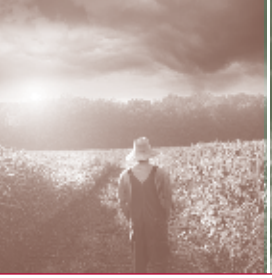


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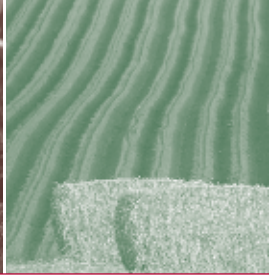

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THE CHANGING BUSINESS OF ORGANIC

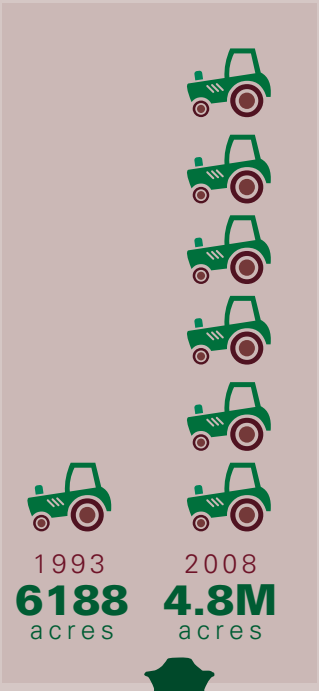
2500 certified farms (approx.)

1994

13000 certified farms (approx.)

2007

82%
of conventional retailers carry organic foods (2007)



THEN 1990

$1 Billion in sales

GROWTH

$26.7 Billion in sales

NOW 2010

ORGANIC PRODUCTS

Facts and figures from usda.com

Introduction

Sonya Michel

The food system of the United States is currently witnessing a remarkable shift. Small farms and artisanal producers are on the rise, working with restaurants, institutional food services, and retail outlets to make locally-sourced, sustainably-grown food more widely available. Health- and environment-conscious consumers—"the locavores"—are placing new demands on the food system in ways that are affecting the nation's economy as well as its eating habits (see the "infographic" opposite). On March 4, 2011, United States Studies at the Wilson Center, with the support of the Chesapeake Bay Trust, convened practitioners, scholars, farmers, producers, and food activists to discuss both the scope of this phenomenon and the challenges faced by those seeking to transform the way Americans eat.

One of the greatest challenges, according to Fred Kirschenmann, a noted expert on sustainable agriculture, is moving from industrial to "agrarian" agriculture. As Kirschenmann explained, the food systems of the United States and other developed countries depend on "stored, concentrated energy" that is being rapidly depleted. To feed future populations, the entire food system must be redesigned.

> "...the food systems of the United States and other developed countries depend on 'stored, concentrated energy' that is being rapidly depleted."

The best way to do this, according to Kate Clancy, another leading expert on sustainable food systems, is to pay attention to scale. "A properly managed system," she said, "should self-organize on a scale that respects ecological limits and optimizes both economic and social efficiency." Solutions to complex problems must come from across scales in the system. This requires local efforts to interact with the scales both above and below. Kirschenmann and Clancy both expand on their views in the papers that follow in this report.

Transforming Food Cultures

Transforming food systems depends on changing not only how we use land, but also on the cultures surrounding food. According to Erik Assadourian of the Worldwatch Institute, Americans must shift dietary norms, an effort that involves government, business, education, the media, social movements, and cultural institutions.

One model comes from the Jewish community, where innovators such as Devora Kimmelman-Block promote sustainable organic meat production as part of the practice of "keeping *kosher.*" She and others have been rethinking the meaning of kosher—literally defined as "fit for consumption"—within the modern American food system. "Shouldn't food that is an expression of holiness demonstrate a healthy relationship between humans and nature?" Kimmelman-Block asked. By adding environmental stewardship and workers' rights to the established tenets of kashrut (the laws of keeping kosher), people will once again come to "treasure their meat."

Schools are another major site of efforts to transform food culture, but here the process gets complicated. When former *Washington Post* reporter and *The Slow Cook* blogger Ed Bruske discovered that the food service company that supplied the cafeteria in his daughter's elementary school offered few fresh ingredients or healthy options, he went into action. With other parents, he succeeded in getting D.C. public schools to improve their menus—but then they discovered, much to their chagrin, that students were throwing away much of the healthiest food.

Students are more likely to eat "what's good for them" if they have a better sense of where and how their food is grown. Accordingly, activists all over the country have set up farm-to-school programs, through which students visit local farms or learn how to plant their own gardens. Those with educated palates also tend to eat more healthily, as University of Vermont anthropologist Amy Trubek found when she engaged young students in a project to identify and describe the specific tastes of maple syrups produced in different parts of her state.

Feeding the Locavore

College students have been easier to win over than the K-12 set, but adopting sustainable practices and procuring adequate supplies of local food can stump those who run large-scale institutional food services like campus dining halls. Rafi Taherian, director of Yale University's Food Services, noted that most local producers cannot offer the quantities he needs to purchase every day. He is working with other universities along the Eastern Seaboard to create a buyers' network which, by ensuring a steady market, may allow smaller producers to expand.

Similarly, restaurateurs who wish to go locavore may be unable to procure the variety of ingredients needed for certain foreign cuisines. Dean Gold, owner of an Italian

restaurant in Washington, D.C., reported that he came to local and organic food not only because it was sustainable, but also because it was the best tasting and freshest available to him. Yet to support the full range of dishes he wants to serve, Gold must combine local ingredients with artisanal products from around the world.

For many in the United States, however, going locavore is simply not an option. Almost 24 million Americans live in "food deserts" where they lack access to fresh produce of any type, according to Ellen Holtzmann of the Food Trust in Philadelphia. Through its Pennsylvania Fresh Food Financing Initiative, her organization coordinates public and private business financing to make sure that healthy, sustainably-produced ingredients are available in the local corner and grocery stores that anchor community life in many low-income neighborhoods.

Food and Finance

In addition to distribution and consumption, the economics of supply is a key element of the sustainability equation. Here, too, the obstacles are multiple. For one thing, as organic farmer and consultant Anthony Flaccavento noted, farmers are facing a shift from the era of "empty-world economics," when arable land was plentiful and cheap, to "full-world economics, where it is scarce." A century ago, there were fourteen acres of productive land per person; now there are only 3.5. Growers must use land as efficiently as possible, but they are often hampered by water scarcity and climate change. Moreover, many are dispersed in distant corners of the country at the ends of long supply chains, far from the concentrated markets where food is consumed. All of these factors raise the cost of food production and distribution. Accordingly, Flaccavento argued, Americans must recognize that "they can afford to pay more for food" that is sustainably raised.

University of Florida agronomist Rosalie Koenig agreed that consumers must be the real drivers of sustainability, but she raised another issue: human capital. "Only one percent of the population goes into farming," she reported. Because the life of a farmer is demanding and the rewards small, the American farmer is becoming an endangered species. Young people today are unwilling to enter an occupation that offers no health insurance, uncertain income, and crushing debt.

Goat farmer and artisanal cheesemaker Angela Miller provided a real-life example of how difficult the existence of a small-scale producer can be. Despite winning multiple awards for her washed-rind, farmstead, and continental hard cheeses, the proprietor of Consider Bardwell Farm in southwestern Vermont continues to depend on her "day job" in publishing to make ends meet. In between tending her flock ("kidding" time in early spring is especially busy) and selling her wares at local

markets and county fairs, she reads manuscripts and works closely with her stable of authors.

As Vice President of Young, Beginning, and Small Farmer Programs and Outreach at the Farm Credit Council, Gary Matteson is familiar with these problems. While working to identify and meet the needs of the next generation of farmer and ranchers, he is also realistic about the financial limitations of the industry. "Farmers need to think of themselves as rural entrepreneurs, layering one type of enterprise upon another," Matteson advised. Among the options they might consider is "agrotainment"—creating family-friendly farms and orchards that attract visitors and add an additional income stream.

Location and sales modes also affect viability, according to agricultural economists. David Swenson of Iowa State University noted that growers must be sited near densely populated metropolitan centers if they want to sell locally. Stephen Vogel of the United States Department of Agriculture found that small farmers' heavy reliance on direct sales, rather than intermediaries or wholesalers, may constrain profitability. Bringing produce to a farmers' market two or three times a week allows growers to meet their customers face-to-face, but it is time-consuming.

For this reason, many farmers are turning to "CSA"—community-supported agriculture—through which groups of consumers pay a fixed amount for weekly deliveries of seasonal produce. Others are participating in "agriculture of the middle"—aggregating their products with those of other farmers in regional hubs. Grain elevators and dairy cooperatives have been around for more than a century, but this is the first time that vegetable growers and agricultural artisans are using aggregation to sell their products.

Unlimited Resources?

These findings and experiences indicate that local food production may not be the best way to revive the American economy, but economics is not the only consideration. Locavorism is also linked to the larger question of sustainability, and at the most fundamental level, both consumers and producers are beginning to realize that sustainability is not just an aesthetic preference but a matter of survival. While the world's population is increasing, natural resources are disappearing, and food supplies that once seemed infinite are dwindling.

In the United States, for example, 85 percent of the seafood consumed today is imported. According to Angela Sanfilippo, president of the Gloucester (Massachusetts) Fishermen's Wives Association, her city "fed New England for four hundred years," but it can no longer do so. Lengthening supply chains and an increase in international trade

have not only devastated local fishing industries but also harmed the environment. Overfishing has become a significant global problem, and ocean environments everywhere are being threatened.

Sanfilippo's organization operates Cape Ann Fresh Catch, a community-supported fishery program similar to a CSA that works with local fishermen and shoreside operations to deliver fresh, sustainable seafood to members. Sanfilippo sees this as a viable model for other communities, as long as members are willing to use their ingenuity. Just as CSA participants must figure out how to cook rutabagas and other unfamiliar vegetables, she said, CSF participants must learn ways to prepare underutilized fish species.

But is local food ultimately the answer? Not necessarily, according to Pierre Desrochers of the University of Toronto. The development of a global food system has helped mitigate the severe effects of famine and food insecurity for millions. Moreover, he pointed out, global distributors are essential in providing an uninterrupted food supply to regions with limited growing seasons.

There is, however, a tension between expanding global food supplies and regularizing distribution worldwide, on the one hand, and preserving the means of production—land, water, and the full range of plant and animal species—on the other. As Schuyler Null, a writer-editor with the Wilson Center's Environmental Change and Security Program, warns, "yields must be increased without destroying our future capacity" to produce food. Thus, while sustainability must be conceived in global terms, the way to achieve it may well lie in the knowledge, awareness and practices that local food producers are growing—along with their heirloom tomatoes.

Contemplating the Sustainability of Agriculture in the 21st Century

Frederick Kirschenmann

Ever since the term "sustainability" was applied to agriculture in the 1980s, there has been an ongoing debate about what it means. Defining the word "sustainability" is not in and of itself problematic; any standard dictionary defines it as "maintaining" something or "keeping it going." What is challenging is determining *how* to maintain our food system, *how* to keep it going. On that question we can have an engaging conversation.

Today there are essentially two schools of thought on the subject. One proposes that the best way to maintain our food system is simply to intensify the current system. From this perspective, we only need to do more of what we have been doing in our industrial food system, that is, apply the principles of industrial economy to food, namely specialization, management simplification, and economies of scale. These principles have enabled us to reach maximum, efficient production for short-term economic returnthe central goal of all industrial enterprises. Further intensification of these principles, it is argued, can be achieved with new technologies, additional concentration, and augmentation of our global free-trade distribution system.

The other school of thought argues that while industrialization has succeeded in reaching its singular goal, it has degraded our long-term potential to maintain a viable food system and has therefore actually made it less sustainable. Consequently, this perspective declares, we must radically redesign our food system, and in order to achieve a higher degree of sustainability, we need to apply the principles of agroecology.[1] Such principles must be applied to all future social, economic, and bio-physical food design (Perfecto et al. 2010).

A Short History of Sustainability

To determine which of these two schools of thought is the most promising for achieving sustainability in our future food system, we might explore sustainability in the context of history. How have we successfully fed ourselves in the past, and can any of those approaches be maintained?

In that regard, anthropologist Ernest Schusky provides useful guidance. Schusky (1989) points out that prior to the evolution of agriculture some 10,000 years ago, humans fed themselves through hunting and gathering. During this era we simply hunted out a place and then

moved on. This was, by all accounts, relatively sustainable. Gathering, as Schusky points out, required less labor and provided a more nutritious diet than did the more laborious work of domesticating plants and animals that characterized the food system of the Neolithic era. However, domestication did "greatly concentrate solar energy" and likely enabled increasing populations to begin living in settled societies. This is the era that primarily practiced an agrarian agriculture, using mostly human and animal energy.

Then, in the early twentieth century, we entered a third period of food production, one that Schusky calls the "Neocaloric" era, since it is entirely based on "old calories." It was, of course, the Industrial Revolution that laid the foundation for the use of fossil energy which, in turn, fueled this modern form of agriculture. But it was not until the end of World War II that agriculture was designed to function almost exclusively on fossil energy and made possible the "miracle" of dramatically increased food production with minimum labor.

From an energy-efficiency perspective, however, the Neocaloric era is the least efficient food system ever devised. It now requires approximately ten units of energy for every unit of food calories we produce. Furthermore, Schusky persuasively argues, the Neocaloric era will of necessity be a very short period in the timeline of human history since it is based on old calories that are not renewable and being rapidly exhausted. Included in fossil energy are fossil fuels (especially oil and natural gas), rock phosphate and potassium, and fresh water--all of which are being depleted at a very rapid rate. It is therefore highly unlikely that this system can long be "maintained."

Added to this depletion of "old calories" is the fact that the increased use of fossil energy by humans has now resulted in biospheric entropy in the form of greenhouse gases, which has pushed the biosphere out of its dynamic equilibrium and led to unstable climates. The past 11,000 years of abnormally stable climates[2] have themselves served as an essential resource, one that has enabled the highly specialized agriculture of the Neocaloric era. Climate change will therefore add to the challenge of "maintaining" our current food system.

We have also drawn down significantly on our supplies of ecological capital. This is especially true with regard to abundant, biologically healthy soil and our rich storehouse of bio- and genetic diversities, all of which have served as vital resources for the Neocaloric system. Given the erosion of all this capital, a critical question now confronts the human species: how can we design a post-Neocaloric era of agriculture that will enable us to "maintain" a food system that can feed the human species?

Toward a New Food Future

Fortunately, a series of scientific reports and a number of on-the-ground ventures offer directions that can help shape our new food future. The United Nations has issued two reports based on careful analysis of our current food system that suggest some promising alternatives. The first, *Agriculture at a Crossroads: Global Report: International Assessment of Agriculture, Knowledge, Science and Technology for Development* (International Assessment of Agricultural Knowledge 2009), describes a comprehensive assessment of global agriculture and provides many approaches (most of them agroecological) to designing a more sustainable future. The second, Olivier De Schutter's "Agroecology and the Right to Food" (2010), makes similar recommendations and cites numerous examples of agroecological farming methods that have been demonstrated to produce more food, more effectively, than some of the industrial approaches. He also notes that these techniques are being adopted by numerous smaller farmers, especially in the developing world. A third report, *The Future of Food and Farming: Challenges and Choices for Global Sustainability*, just issued by the UK Government Office for Science (2011), also cites alternatives to the Neocaloric model.

All of these ideas show great promise for addressing major challenges facing our food system in the 21st century, including balancing future demand and supply sustainably, curbing the threat of future volatility, ending hunger, lowering emissions, and maintaining biodiversity. None of these reports rejects the idea of developing new technologies, but all of them warn that new technologies will not serve as silver bullets and that systemic social, economic, and biological changes designed on agroecological principles will be necessary.

Numerous other projects and publications point us in a similar direction. The Land Institute of Salina, Kansas, grounded in more than thirty years of research, has now demonstrated that the perennialization of cereal crops is possible. This process can maintain productivity while providing many ecosystem services that contribute to sustainability, such as reduced energy use, restored soil health, enhanced biodiversity, and improved water conservation (Glover and Reganold 2010). Small farmer Takao Furuno has shown that complex permaculture production systems designed to exchange energy among species can dramatically lower

energy inputs, reduce negative environmental impacts, and increase productivity (Furuno 2001).

Two recent articles in *Nature* magazine verify that agroecological approaches to pest management can be superior and more sustainable than using industrial insecticides (Greer 2010; Crowder et al. 2010). The authors found that the intensification of agriculture is one of the main causes of biodiversity loss, eventually leading to "uneven" communities dominated by a few resistant species that actually increase pest problems. Their studies corroborate the conclusions of U.S. Department of Agriculture pest management specialist Joe Lewis and his colleagues, who point out that simply changing technologies from chemical control to biological control will not produce different results. The "single-tactic, therapeutic-intervention" paradigm of the industrial system ends up, in effect, creating the problem it purports to solve (Lewis et al. 1997).

Farmers and Artists

> "a generation of young farmers who are acquainted with the science of ecology and evolutionary biology is emerging."

As the Neocaloric era comes to a close, we face significant challenges to (and opportunities for) redesigning our food system. Shifting from an intensive, industrial agriculture to a more natural, agroecological model will not be easy. We have created immense infrastructures on both the input/supply side and the market/demand side that depend on the current industrial system. Furthermore, farmers have made huge investments in land and equipment that are designed specifically to manage their Neocaloric operations. The number of farmers has also declined drastically and their management skills have been simplified.

Innovative research to design a new era of agriculture, locally adapted to each ecosystem, will require the skills not only of our agronomists and ecologists but also of our sociologists and artists. Restoring the ecological and social capital necessary to the success of the new models will take imagination, dedication, and the evolution of a new culture. Fortunately, a generation of young farmers who are acquainted with the science of ecology and evolutionary biology is emerging. They are becoming especially visible in the new food system, which is increasingly devoted to producing healthy, whole foods rather than the raw-material commodities destined to supply the manufacturing of processed foods.

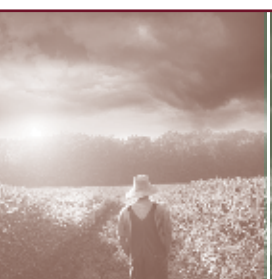
Working alongside the farmers are artists such as Deborah Koons Garcia, the maker of "The Symphony of Soil," a multi-film documentary project that has the potential to develop a new soil culture. Imagining soil as a living community rather than dirt under our feet will be essential to our

new agriculture. It can lead to awareness of the need to care for the soil and restore its biological health, which, in turn, will be one of the keys to designing our new food system.

Endnotes

1 Agroecological, or "agrarian," agriculture puts the restoration, maintenance and "resilience" of the land as a first priority, so its goal is land management for resilient production for long-term economic return, in contrast with industrial agriculture, wherein the first priority has been maximum, efficient production for short-term economic return. The root of the word "agrarian" is "*ager*," or land, so agrarian agriculture refers to a type of agriculture in which the health of the land is a central concern. Consequently the "new agrarianism," a term often used now, refers to the emerging new "agroecological" agriculture as distinguished from "industrial" agriculture.

2 In 1975, the National Academy of Sciences Panel on Climate Variations pointed out that the climate patterns of the past 11,000 years, and especially that of the past century, were exceptionally stable, and that the more "normal" climate pattern on the planet is much more variable and extreme. So they referred to this period as one of "abnormally" stable climate and suggested that the dramatic increase in agricultural yields was due at least as much to these abnormally stable climates as it was to the new technologies we developed. They also pointed out that since these stable climates were "abnormal," we should not expect them to last indefinitely. Therefore we needed to prepare for a future with more unstable climates, which, among other things, may suggest that we should store up production in years of high yields to ensure food supplies in years of low yields (National Academy of Sciences 1975). Dianne Dumanoski (2010) describes a similar climate scenario in her excellent book, *The End of the Long Summer*. The "long summer" is a designation of an "interglacial" period that happens rarely on our planet (the last time one occurred was 410,000 years ago, and it lasted 28,000 years). Our "abnormal" period, she writes, was destined to "last another 10,000 to 20,000 years," but is now destined to "draw to a close" because of the "impact of the modern human enterprise" on our climate (81-83).

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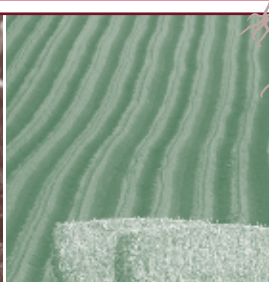

Some Bigger Contexts for Local Food Thinking and Planning

Kate Clancy

Three factors shape the larger context in which "locavorism" operates: scale, food demand, and resilience. These are relevant and critical elements to any discussion of food systems, but have not, I think, received the attention they deserve. In what follows I explain why they are significant, and how food and agriculture researchers and practitioners have been thinking about them.

Scale

Placing boundaries on different scales is somewhat arbitrary; a properly managed system should self-organize to a scale that respects ecological limits and optimizes economic and social efficiency (Newman and Dale 2009). As we all know, a system contains nested scales from the largest to local subscales, and, particularly when it comes to food, we need to keep in mind that the parts overlap depending on where the center of the area is. For example, on maps of the Northeast region (the largest megapolitan region in the United States), there are multiple overlapping local areas (Boston Foundation 2007). The structure of agriculture's co-evolving social-ecological system is central to its functioning, the most important element being that solutions to complex problems must occur across scales, and therefore the scales need to "talk to each other" (Newman and Dale 2009). These conversations between local and other scales have not yet been instituted in most places, but they need to be.

Let me give you one example (there are myriad) where that conversation is critical. Many experts believe, as two have written, that "the territory of land-use problems transcends the legal and geographic reach of existing jurisdictions and institutions" (McKinney and Essington 2006). People in any local area will find it very difficult to make an objective decision about farmland preservation because of competing interests and a lack of information. Local land-use decisions are important for getting community buy-in and identifying priority areas for preservation and agriculture economic development. But most local land-use decisions are made in a vacuum, without any quantitative analyses of the area's food or water demand and supply, or understanding of what neighboring towns or counties are doing. In fact, local control that favors development can undermine an area's food security.

It may be that a region is a more useful unit of analysis for mapping land use and growth patterns and trends and for promoting smart growth initiatives. Furthermore, a regional approach could best address multicommunity and multistate priority areas or bio regions and develop comprehensive land-use and economic development plans (Clancy and Ruhf 2010). It will be a challenging but useful task to think about how localities, states, and regions can go about changing land-use decision-making. This has already been tried in some areas with mixed success, but as more land is lost, more attention will be paid.

Food demand

The preservation of farmland and other land on which food can be produced is perhaps the most critical policy objective for food security. Given growing populations, it's hard to see how we can afford to lose any good farmland anywhere in the world, but an ancillary and important concern is the total food demand of the population living in a particular area. Even a small local area that contains an urban center has a food demand which is quite large and is made up of a wide variety of foods starting with the staple carbohydrate sources (by far the largest calorie supplier in the diet). At this time the entire world constitutes the "foodshed" of most people in the United States, so moving away from the global scale is not easy.

To be strategic it will be necessary to have an idea of the extent of food self-reliance that can be realistically achieved in any local area, and then ask where the rest of the food supply will come from. We have some data on the first question. In 2007, researchers Christian Peters, Jennifer Wilkins and Gary Fick did a marvelous modeling exercise demonstrating that New York State could produce about twenty percent of the food needs of its population. A similar study of regional planning in the Delaware Valley (DVRPC 2010; see also DVRPC 2011) found that the Greater Philadelphia 100-mile foodshed contains sixty percent of the crop and pasture land needed to feed its population. Neither study included urban land in its calculations—and it may add a not insignificant amount to the total—but there will still be a large percentage of total food demand left to be supplied at regional, national or global levels.

Two things are needed here: one is more strategic thinking about the question, what does a more sustainable food system, meeting the triple bottom line of economic, environmental and social goals, look like in different parts of the country and the world? Twenty years from now? Fifty? The second is greater understanding of how the panoply of institutions (governmental, academic, private) communicate with each other and across scales. There are some examples of this, many in New England and elsewhere, like the Great Lakes Commission. The New England governors recently requested five different initiatives on land-use, stating that "effective regional action will add value and substantially advance their states' related agendas" (NEGC 2010). Their agriculture commissioners are on board and encouraging many cross-state activities (*Boston Globe* 2010).

Resilience

Resilience is "the ability to persist through continuous development in face of change, and innovate and transform into more desirable configurations" (Folke 2006). Or, put another way, it is "the magnitude of disturbance that can be absorbed before a structural change occurs" (Newman and Dale 2009). A resilient food system has minimal vulnerabilities to environmental and social shocks and stressors; it has adaptive capacity (the ability to reorganize for better management), and the managers realize that change is the norm and function within that paradigm. There has been some attention to food system resilience in the United States but nowhere near what the Europeans have done, so we don't yet have much information on what food system resilience means and what it would look like. It's easier to see how a resilient farm might be structured (the winter 2010 issue of the *Leopold Letter* describes such a farm in Iowa), but even here the conversation between the farm and the next level, within the same local area, is not described. Unfortunately we have a long way to go in our understanding of how the adaptive capacity of the food processing infrastructure, distribution networks, and retail sector should be developed. We know we must have grain reserves, that we need greatly enhanced rail transport capacity, and many other things yet to be described.

Rosamond Naylor (2009) has suggested some of the principles that might guide the transition to more resilient food systems. These include:

1) accept the limits (e.g. of the natural resource base, of the scale one is working at, of present institutions, of a sustainable diet) and figure out how to redesign to fit the scale;

2) adapt crops and animals to the resource base in which they're being produced rather than the other way around, as is done now;

3) prepare decision tools/plans/redesigns for all components of the food system; and

4) set to work on developing and implementing policies that will support resiliency.

There is challenging work ahead in planning for resiliency. I love Joe Colletti's comment that it isn't rocket science--it's a lot more difficult than rocket science! (Colletti 2010). But there are thousands of research and on-the-ground projects across the country that could be the starting point for this task. Efforts are needed at every scale and I have not tried to hide my interest in regional. But any scale can fall into the trap of thinking it is more important, more obvious, more democratic, etc. (Born and Purcell 2006). In a resiliency framework local, regional, national don't compete with each other but are recognized as vital and complementary.

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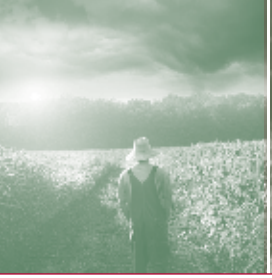


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