

# The Food System: A Potential Future

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## Introduction

As we think about the future of our food system and rethink food security, it is useful to consider the situation as it currently exists, threads of possibility, and a vision for what could be. Those before me have touched heavily on the problems that confront us at this point in time. Not to add to that picture greatly but to touch on a couple of often overlooked facets of current issues is instructive. Within the framework of food systems we tend not to talk about and not to think a great deal about water. I live in Michigan, the only state in the U.S. that is entirely within the Great Lakes Watershed. Michiganders think a lot about water because we enjoy it and many who live in water scarce areas want it. Globally, water is a major issue. Right now there are 48 countries that are either water scarce or water stressed;<sup>1</sup> by 2050 another six countries are projected to be water scarce. If we compared food production with water stress/scarcity regions we would find

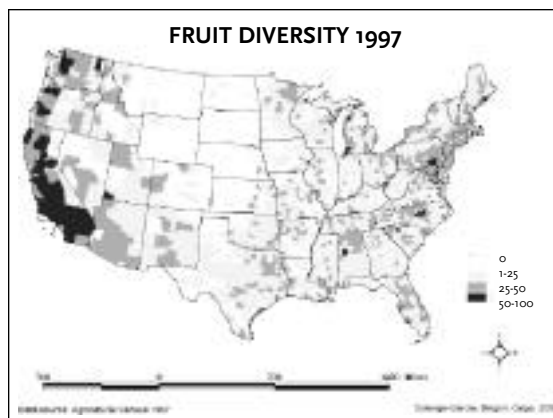


FIGURE 1



FIGURE 2

significant amounts of food production in these areas—often for both indigenous consumption and for export. In addition, some water stressed areas of the United States produce large amounts of food crops that are shipped all over the country. Water stress in the western United States is somewhat congruent with areas of high fruit and vegetable production diversity (figure 1<sup>2</sup>). Further complicating the future productive capacity of highly productive lands are population growth and spread. Simultaneously one of the most beautiful and frightening pictures is a nighttime satellite photo of North America (figure 2<sup>3</sup>). Highly productive areas are overlaid with large population centers. It has been estimated that 86% of our fruit and vegetable production, 63% of dairy production, 39% of meat production, and 35% of grain production occur in urban-influenced areas.<sup>4</sup>

We can think of this as both an opportunity and a threat. On the one hand, places with high food production diversity are under heavy threat of development. However, there is

<sup>1</sup> United Nations Environment Programme <http://www.unep.org/vitalwater/19.htm>

<sup>2</sup> Colunga-Garcia, Bingen, Gage (2004) personal communication

<sup>3</sup> International Dark Sky Association [http://www.darksky.org/images/satellite/usa\\_lights\\_small.gif](http://www.darksky.org/images/satellite/usa_lights_small.gif)

<sup>4</sup> American Farmland Trust [http://www.farmland.org/farmingontheedge/about\\_food.htm](http://www.farmland.org/farmingontheedge/about_food.htm)

also significant opportunity to rediversify our agricultural production in these and other areas of the U.S. For example, researchers at Iowa State University have outlined the historical range of production in areas of Iowa and identified broad potential for enhanced diversity in production with linkages to more local and regional markets.<sup>5</sup> Many areas that used to be fruit and vegetable production regions for local economies have largely lost their agricultural diversity but maintain the climate/soil opportunity to rediversify production. In other words, the future of our food system is intimately connected to development and land use decisions in communities across the country. These decisions tend to be very local decisions at the township, municipality, or county level. There are thus a tremendous number of decision-making bodies across the country determining the lay of our landscape over the next 25-30 years and on into the future.

This is very clearly connected to our current loss of "farms in the middle." The North Central Region of the U.S. lost 8.5% of farms from 180-499 acres and 10.8% between 500-999 acres.<sup>6</sup> Michigan is projected<sup>7</sup> to lose 71% of farms between 50-500 acres over the next 25 years. That's about 17,000 farms in Michigan rural communities, 17,000 small business owners, 17,000 families that participate in volunteer organizations such as the PTO and school board, and 17,000 families that are taking care of a landscape while drawing less in municipal services than they pay in property taxes. This creates, in my mind, a sense of urgency for thinking about the relationship of rural landscapes to rural communities as well as to urban communities. There is a profound relationship between our rural and urban areas that's important to consider.

From another perspective, on average we consume a very sub-optimal diet. In Michigan, we eat about 12 billion pounds of food a year from the major components of the food guide pyramid. If we actually ate the way we're supposed to eat—decreased less nutritious items and increased such things as fruits and vegetables—we'd need 13-14 billion pounds of food. Thus, our dietary consumption patterns have the ability to drive an increased diversity in our agricultural production. It has been estimated that nationally we need another 5 or 6 million acres of production to produce the kind of diet we should eat.<sup>8</sup> We are presently incapable of providing a healthy diet for everyone in this country with current domestic production.

### **Framing Sustainability in the Food System**

Thus, a starting point for considering a sustainable food system vision is focusing on relationships among activities in communities. If we frame the concept of healthy, livable communities around three access points: (health, environment, and economics) then we can imagine health outcomes from the standpoint of people maintaining a quality standard of life as they mature and age rather than focusing on how we treat diseases. We can imagine environmental outcomes that enhance our natural resource base for future generations, not degradation and restoration. We can imagine economic outcomes that create vibrant urban and rural communities aided through networks of small business owners.

How would we incorporate the idea of sustainability into this framing of healthy, livable communities? First is the recognition that we can't define sustainability as an endpoint. As we move towards greater sustainability across the facets of social, ecological, and economic

<sup>5</sup> R. Pirog & Z. Paskiet (2004). A Geography of Taste: Iowa's Potential for Developing Place-based and Traditional Foods. <http://www.leopold.iastate.edu/pubs/staff/files/taste.pdf>

<sup>6</sup> M.W. Hamm calculated from USDA, 2002 Census of Agriculture

<sup>7</sup> Public Sector Associates (2001), Michigan Land Resources Project

<sup>8</sup> C. E. Young & L.S. Kantor (1999). Moving Toward the Food Guide Pyramid: Implications for U.S. Agriculture. *Agricultural Economic Report No. 779*.

dimensions, we will identify other shortfalls to our practices. In other words, 10 years from now we will hopefully have a very different concept of sustainability than we do today and 20 years from now it will further evolve. Sustainability is a process of improvement. A recent focus group we conducted with farmers and others in the food system brought this home to me. In response to a question concerning their role in preserving the environment one farmer said (paraphrasing), "Well, I think that I do a better job than my dad did 20 years ago. I use fewer pesticides, partly because it's more expensive now, and it costs me money to do it, but I do a better job and hopefully my kids will farm and they'll do a better job than I do."

With this in mind, when I think of a sustainable food system, I think of more rather than less, as in shorter food commutes on average rather than longer. This doesn't mean we're going to get everything from a local place and it doesn't mean we're going to get everything from a global place, but it means we shorten the food commute. It means that we have more understanding of our roles and responsibilities rather than less. It means that there is greater environmental sustainability rather than less, that there are more relationships built between people focused around food rather than less, and that there's more rather than less control by individuals.

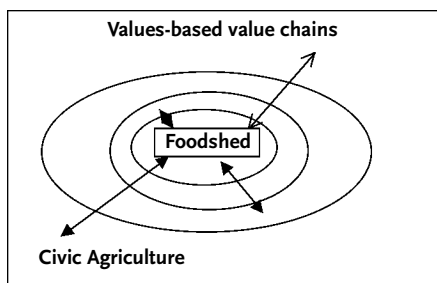


FIGURE 3

How do we put this in a food system context and maintain a perspective regarding the volume of food required to feed 10 million people—about 12 billion pounds? There are three schools of thought in the literature that I believe can be integrated to help conceptualize a vibrant, sustainable network of community-based food systems (figure 3). Kloppenburg<sup>9</sup> et al have developed the "foodshed" concept. While there are a number of facets to the concept I will only utilize the

spatial aspect for this discussion. Similar to the drainage area of a watershed, a foodshed is the area from which people could or do get their food. In its simplest terms, it's a spatial relationship to our food system. Lyson<sup>10</sup> has introduced the concept of "civic agriculture" with expansion of the concept by DeLind.<sup>11</sup> Again, simplifying for the sake of brevity, it is a concept that focuses on direct market relationships between producers and consumers and about building food-focused relationships between people. Finally, there is a newly emerging concept of values-based value chains.<sup>12</sup> The conceptual intention is to maintain transparency in the supply chain in which values desired by consumers begin with the producer and are identity-preserved as they move through the food chain to the consumer. In addition, the concept implies a greater degree of price-making (for example, cost plus pricing) by producers. It is intended as a way to build relationships between producers, consumers, and all the intermediaries involved in moving food from field to fork over the course of a year. Linking these concepts implies a dynamic relationship between self-provisioning (i.e., home and community gardens), direct market relationships (i.e., farmers' markets, farm stands, and CSAs), and indirect market relationships (i.e., retail markets, institutional food meals, restaurants) in a manner that maintains a consistent set of values throughout. These indirect market relationships can be either at the local, regional, national, or global level. It can kind of be at any scale, but it is a matter of looking at relationships between people.

As we develop a framework for understanding spatial relationships to our food system—the foodsheds from which we draw food, the relationships that are developed with direct market

<sup>9</sup> J. Kloppenburg, J. Hendrickson, & G. W. Stevenson (1996). Coming into the Foodshed. *Agriculture and Human Values*, Vol. 13, pp. 33-42.

<sup>10</sup> T. Lyson (2000). Moving Towards Civic Agriculture. *Choices*, pp. 42-45.

<sup>11</sup> L. DeLind (2002). Place, Work and Civic Agriculture: Common Fields for Cultivation. *Agriculture and Human Values*, Vol. 19, pp. 217-224.

<sup>12</sup> See for example the Leopold Center at Iowa State University <http://www.valuechains.org/valuechain.html>

relationships through civic agriculture approaches, the relationships that are built through values-based value chains, and transparency in the supply chain between producer and consumer—distance can not be the only defining trait of importance. As we start to move things from greater distances to shorter distances and as we start to build relationships over greater distances, what kinds of relationships do we build and how do we honor one another? I am reminded of framing concepts in sustainable development, one being import substitution. When we consider import substitution and shortening food distances, we should consistently revisit the potential for "local" to be just as environmentally degrading as distant, just as animal unfriendly, and just as unfair to labor (a farmer's own labor as well as the hired help). It can have very little relationship to enhancing democratic processes. There may be nothing inherently superior about local that makes it better than getting something more distant, with the exception of shortening the food miles and saving energy. In other words, it is equally important to consider issues of equity and democracy, fair labor trade and environmental stewardship,<sup>13</sup> as hallmarks of both civic agriculture and values-based value chains.

None of this is intended to negate self-provisioning: people producing for themselves, their families, their friends. There is a great deal of inherent value in people producing fresh produce and more. In 1998 we consumed about 100 pounds more per year from commercial vegetable production than in 1919, but we consumed 120 pounds less per year per capita from home production.<sup>14</sup>

<p><b>Criteria for food sourcing</b></p> <p>—If we can source local we should</p> <p>—If we can't, can we substitute?</p> <p>If from outside are the same values transparent?</p>
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FIGURE 4

Interestingly, the overall differential in consumption is not far off the increase we need to meet recommended levels of consumption. There is a marked potential to increase our consumption from community and home gardens. It may be true that self-provisioning also

increases opportunities for farmers to expand their production portfolio due to an increased willingness to try on the part of consumers. Also, several studies demonstrate widespread interest in supporting sustainable and family farmers. The Hartman Group reported that about 52% of U.S. shoppers want to support sustainable farmers<sup>15</sup> while a study from North Carolina State indicated that 71% of respondents wanted to see policies supporting family-owned, environmentally friendly farmers.<sup>16</sup> It is, however, useful to remember that personal attitudes and behavior in the marketplace are not necessarily congruent. Another study gives credence to the relationship between direct and indirect marketing.<sup>17</sup> In this study of consumers' interest in purchasing local foods, 80% say they'd like to purchase at the grocery store, 75% at farmers' markets, 71% from local farmers at the farm, and 55% at restaurants or cafeterias. In other words, there is an array of data demonstrating broad interest in a range of outlet points for food. Where do we start?

### A Sampling of Approaches to Change

A number of approaches are being developed, implemented, and modified across the country to evolve a sustainable food system. One significant place to start is with today's youth. Thus, for example, California has a statewide policy to develop a garden in every school.

<sup>13</sup> A.C. Bellows & M.W. Hamm (2001). Local Autonomy and Sustainable Development: Testing Import Substitution in Local Food Systems. *Agriculture and Human Values*, Vol. 18, pp. 271-284.

<sup>14</sup> USDA, *Major Trends in U.S. Food Supply, 1909-99* (Food Review, Volume 23, Issue 1).

<sup>15</sup> Taken from a talk by Jennifer Wilkins, Cornell University

<sup>16</sup> R. C. Wimberley, et al. Food from Our Changing World: The Globalization of Food and How Americans Feel About It (accessed at <http://sasw.chass.ncsu.edu/global-food/foodglobal.html>).

<sup>17</sup> Attracting Consumers With Locally Grown Products. *Food Processing Center, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln* (2001).

Community non-profits, 4-H educators, teachers, and others across the country are building living, learning spaces focused on plants. Many professionals conduct nutrition education in schools to encourage better eating habits. This provides a wonderful opportunity but also, to me, a challenge. Nutritionists in this country are typically trained to think that all food is equal—that one apple is no different from another and that all food has a place in a healthy diet. But food has attributes that go beyond the chemical and nutritional content. In fact, these attributes may help modify the chemical composition. Food has differences.

We recently completed a survey of 664 Michigan school food service directors (FSDs) in which we asked them a number of questions concerning their practices as well as interest in sourcing Michigan agricultural products for their school lunch programs. When asked their level of agreement with the statement, "I would purchase food directly from a local producer if price and quality were competitive and a source were available," 73% of the respondents either agreed or strongly agreed. When asked their level of agreement with the same statement, only with the products coming through distributors, the percentage agreeing or strongly agreeing significantly increased to 85%. That represents 275 school FSDs who've said they'd like to source Michigan products through their distributors. Now the trick is making it happen. These schools use, on average, three to five distributors with a couple having a large market share and a number of smaller ones. The FSDs identified barriers that need resolution but also reasons for interest that can be utilized. Interestingly, with no formal "Farm to School Program" in place across the state at the time of the survey, 40 FSDs indicated that they had sourced from local farmers in the last year. We have begun to identify some of those people and learn their stories. On the western side of Michigan there is one FSD in an apple growing region who goes to a local farm every week and gets two bushels of apples. There is another one who lives in a blueberry producing area. After getting blueberries from one of the local blueberry farmers, she received a standing ovation at the school board meeting for her actions: it turns out one of the school board members is a blueberry farmer. We're also finding that a number of the school FSDs grew up on farms and have a passionate interest in farm to school connections—an immediate connection that can be tapped.

“FOOD HAS  
DIFFERENCES.”

If we then consider the household purchasing power of 105 million U.S. households, the potential for change is staggering. These households spend on average \$5,375 per year on food. That's about \$325 billion of food spending annually for at-home consumption and about \$239 billion away-from-home spending.<sup>18</sup> This, coupled with the number of people indicating a desire to purchase food with attributes consistent with ideas outlined in this paper, creates a tremendous potential for consumer and market driven change in our food system. Another way to think about it is to consider the "six degrees of separation" concept. Several national meetings on topics related to the theme of community-based food systems annually have upwards of 500 attendees. If those 500 each organized six families to buy direct local and indirect value-chain products with other environmentally and socially sound incorporated attributes, and those six got six and so on through six degrees of separation, the final tally of impacted families would be 24 million. In other words, it doesn't take heroic steps by individuals but rather small steps by large numbers of people to make significant change happen. It takes those that Gladwell refers to as the early and late majority to engage in the change.<sup>19</sup> It may be useful to consider manageable actions: these 24 million families averaging \$10 per week of local produce for 20 weeks per year equals \$4.8 billion dollars of

<sup>18</sup> U.S. Dept. of Labor, Bureau of Labor Statistics (2002)

<sup>19</sup> M. Gladwell. *Tipping Point*.

sales; purchasing one gallon per week of pasture-based milk at \$3.50 per gallon equals \$4.4 billion dollars of sales; purchasing 2 dozen eggs per month from farms managed across environmental and animal welfare criteria at \$2.50 per dozen equals \$1.44 billion dollars; purchasing an additional \$1,500 per year via values-based value chains equals \$36 billion dollars. This totals \$46.64 billion dollars or about 15% of the total at-home food spending. Clearly, relatively small changes by many households yield a large effect.

Comparable changes could happen on the away-from-home side. In fact, some argue that this might be an easier side of the potential to tap. What we can't possibly know at this point is: When do we reach the tipping point? When do these types of purchasing patterns become a social epidemic? With the examples above, 20-25% of the population is directing 15-20% of food sales through these various routes: self-provisioning, direct market relationships, and values-based value chain relationships. At what point do we reach a situation in which doubling is assured? I don't have an answer to that. What I do have an answer for, however, is the power of linking public health messages with a food systems approach to enhanced sustainability. Examining fruits, vegetables, and dairy can be informative.

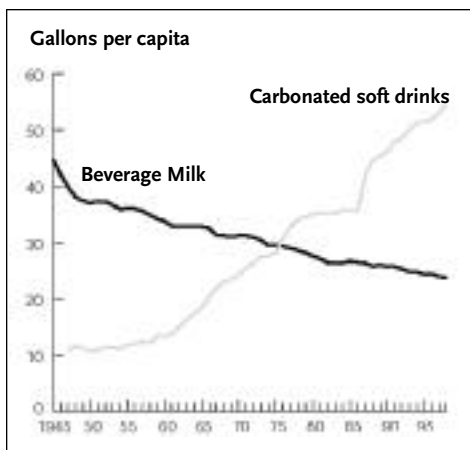


FIGURE 5

As we all know, very few people in the U.S. consume a diet consistent with the dietary guidelines promoted by nutritionists and public health professionals. But what would happen to production and distribution opportunities if we did? Using Michigan as a case study, what if consumers in Michigan did eat five servings a day of fruits and vegetables? Based on current average consumption, it would mean about 100 pounds more per adult or about 78,000 more acres of production by Michigan and Northeastern yield standards. That's a lot of produce. Setting aside issues of lactose intolerance and dietary restrictions (whether medical or philosophical), what if consumers drank

the entire recommended daily allowance of dairy? We do have a good idea that people are getting insufficient calcium and that there is an increasing risk of osteoporosis with insufficient bone stores of calcium (along with inadequate weight bearing exercise) as people age. In Michigan, the current intake deficit is equivalent to about 5.2 billion pounds of food. There is about a two-fold variation in annual milk production depending on dairy production strategies: at 25,000 pounds per cow we would need 200,000 additional cows while at 13,000 pounds per cow, about typical for a seasonal, heavily grass-based dairy cow, that's about 345,000 cows. Disperse 200-400,000 cows across the countryside at a couple acres per cow and you have a large amount of landscape that can be sustainably managed to enhance ecosystem services and provide livings for families across the state. Reversing the curves seen in figure 5 can be developed in such a way to both help reduce future health care costs and improve the sustainability of our food system.

In all of this I firmly believe that the Land Grant Universities and higher education in general have a profound role to play. For me, a fundamental role of the land grant system is to help provide a context for decision-making about alternatives and options as people, families, communities, and governments develop and evolve. The land grant role is not to predetermine a narrow range of options e.g., only pursuing research, teaching, and outreach in those narrow areas. It is to recognize that we are here to conduct research, teaching, and outreach

that expands, illuminates, and provides a context for decision-making; decisions mean alternatives to weigh and consider.

It is within this context that I choose to do my work and consider what a vibrant food system might look like. In brief, I'd like to live in a food system in which I know where a significant percentage of my food comes from, not necessarily all of it. I don't have enough hours in a day to track everything that I eat but I'd like to know where a lot of it comes from. I'd like to know that the production, processing, distribution, and waste were done in an environmentally sensitive manner. I'd like to know that the democratic principles upon which this nation was founded are made stronger and not weakened through consolidation and monopolization. I'd like to know that the farmers who grow our food are honored as heroes and not marginalized as commodity producers. I would like to know that every person and consumer working in the food system has the opportunity to reach their potential and is not limited by less than living-wage jobs, poor nutrition, and substandard education. I would like a food system in which food is a right and working honestly is a responsibility. It appears that we have reached a moment in time that is, literally, ripe with opportunity. We can embrace this opportunity, link with a large percentage of U.S. residents, and evolve an ever more sustainable food system.

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Dr. Michael Hamm is the C.S. Mott Professor of Sustainable Agriculture at Michigan State University and head of the C.S. Mott Group for Sustainable Food Systems at MSU. His appointment encompasses teaching, the Experiment Station, and Cooperative Extension. The work of the C.S. Mott Group for Sustainable Food Systems at MSU is focused on small and medium-scale family farm viability, equal access by all members of a community to a healthy diet, and dispersing animals in the countryside. Prior to moving to MSU he was Dean of Academic and Student Programs for Cook College, Rutgers University. At Rutgers he co-founded and directed the New Jersey Urban Ecology Program, an effort that brings together individuals from diverse backgrounds to address sustainable food systems in New Jersey. Michael has also been facilitator for the New Jersey Cooperative Gleaning Network and the founding director of the Cook Student Organic Farm from 1993 to 1998. He was board member and board president of the Northeast Organic Farming Association of New Jersey. He does research in the areas of community food security and community and sustainable food systems.