The 20% Shift

The Economic Benefits of Food Localization for Michigan and The Capital Required to Realize Them

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Executive Summary

A growing body of evidence suggests that "local food" stimulates the local economy, improves environmental stewardship, boosts healthy diets and public health, and creates a stronger civic life. Given these myriad benefits, a growing number of regions and communities are strategizing ways to accelerate this trend and fully realize the potential benefits.

This paper evaluates the economic impacts the state of Michigan would enjoy through a 20% shift toward local food. A "20% shift" means that for each food sector, a fifth of all non-local consumption shifts to local foodstuffs and local production expands accordingly.

Using IMPLAN, this paper details the principal characteristics of the food economy in Michigan. For each of the 52 food sectors in the model, we show the levels of demand, export, production, and leakage. We then calculate some of the economic benefits of a 20% shift.

The model shows that in 2010 there were 524,250 food jobs in Michigan. A 20% shift could create as many as 42,519 new jobs – 18,412 directly in new food businesses, 14,001 through new supply-chain spending (indirect effects), and 10,106 through new spending by employees in these direct and supply-chain jobs (induced effects). These are potential jobs, without consideration of potential constraints.

To put 42,519 potential new jobs in perspective, this would put one-in-ten unemployed residents of the state back to work. Additionally, the 20% shift would generate $1.5 billion in new annual wages and $2.9 billion in additional value-added. The 20% shift would generate an additional $255 million in annual state and local tax collection. That means that an annual government investment at somewhat below that level, if it achieves the 20% shift, would be fiscally prudent.

While Michigan has a relatively diverse food economy, it could generate jobs in almost every sector: in farming, animal raising, and slaughter; in value-added manufacturing, especially meat and dairy products; in fishing; even in food service.

Not all the possible jobs from a 20% shift are plausible. Some potential crops, like tree nuts, may be hard to grow in Michigan. Other significant barriers to the 20% shift include land, labor, technology, and consumer behavior. The expansion of local food businesses also would require $3 billion of new investment capital. As large as this number is, however, is represents about 1% of the short-term savings Michigan residents have in banks and credit unions, and about a quarter of 1% of what they have in long-term stocks, bonds, mutual funds, and pension funds.

Introduction

Around the world food-localization initiatives are gaining momentum. This movement seeks three interrelated goals: shortening the distance that food travels between farm and the table; capturing more of the value-adding activity associated with the growing, sorting, processing, packaging, distribution, selling, and serving of food; and maximizing the local ownership of all the enterprises involved these value chains. If achieved, these goals would produce four distinct benefits:

- ***Stronger Community Economies*** – Local food is a critical economic driver for local economies. Every loaf of bread unnecessarily imported means the "leakage" of bread dollars outside the local economy and the loss of local bread businesses that could contribute to community prosperity. Moreover, local ownership of a bread factory matters, because locally owned businesses spend more of their money regionally than do comparable non-local businesses. Unlike outsider-owned businesses, local businesses tend to have local CEOs advertise in local media, hire local accountants and attorneys, and reinvest profits in their community. Numerous studies have documented that a dollar spent on a local business typically yields two to four times the "economic multiplier" – the underlying source of income, wealth and jobs – as an equivalent non-local business.[1] Additionally, there is a growing body of evidence that local businesses are particularly good at attracting tourists and future entrepreneurs, promoting creative economies, and stimulating charitable contributions.[2]
- ***Ecological Sustainability*** – Local food promotes not only general economic development but also *sustainable* economic development. Farmers, whether rural or urban, are among the most important stewards of the land. Because agriculture accounts for approximately 30% of the earth's land surface, environmentally sensitive production of foodstuffs is critical to maintaining healthy habitats, air, water, soil, and ecosystems needed to support healthy people.[3] To eat sustainably, moreover, means growing and processing foodstuffs in a sustainable manner. Any community on the planet that cannot sustainably feed itself necessarily places burdens on the

[1] The best studies in this area have been done by two economists at Civic Economics based in Austin. See, for example: "Economic Impact Analysis: A Case Study," monograph (Civic Economics, Austin, Texas, December 2002); and "The Andersonville Study of Retail Economics," monograph (Civic Economics, Austin, Texas, October 2004). Both can be downloaded for free at www.civiceconomics.com . These studies also show significant variations among firm, sectors, and locales, so they should be generalized and applied to local food businesses with caution.

[2] Michael H. Shuman, *The Small Mart Revolution: How Local Businesses Are Beating the Global Competition* (San Francisco: Berrett-Koehler, 2006), pp. 39-62.

[3] World Resources Institute, *World Resource 2000-2001 People and Ecosystems: The Fraying Web of Life* (Washington: Elsevier Science, 2000), p. 56.

ability of other communities to feed themselves. Put positively, business models that meet local food needs sustainably can, if shared and multiplied globally, teach communities in other parts of the world to feed themselves more sustainably.[4] Moreover, since locally owned businesses, including local food businesses, tend to spend their money locally, their "inputs" tend to travel less, use less energy, and thereby emit fewer pollutants and less climate-disrupting carbon.[5]

- ***Better Nutrition and Health*** – Another dimension of economic development is the well being of human capital, and here local food also has much to contribute. Because many foods lose nutrients over time, local food means quicker delivery of foodstuffs of generally greater nutritional value.[6] Moreover, knowing a farmer or rancher tends to enhance a consumer's trust in the healthfulness of his or her products. Local foods also typically are grown with fewer pesticides and fertilizers, and involve less processing, which means fewer chemicals and additives. Replacing processed food (especially refined sugars and carbohydrates) with fresh food, as author Michael Pollan argues, is a powerful way to improve consumer health and reduce the incidence of obesity and diabetes.[7] Every headline about a breakdown in the mainstream food system – outbreaks of e-coli in hamburger meat and peanut butter from distant suppliers, for example – is

[4] The growing, harvesting, raising, or capturing of specific foodstuffs are all dependent on many natural endowments – water, climate, ecology, genetics – that are not universally available. But technology is steadily leveling the playing field to the point where there are compelling examples of communities feeding themselves in every extreme—cold or hot, wet or dry, high or low, urban or rural. The development and spread of better and cheaper greenhouses, hydroponics, rooftop and suburban lawn gardening, and urban farms will hasten this equalization. A further point is that even if a community is capable of producing no raw foodstuff, it still in theory can find, from other communities, excellent models for small-scale food processing, distribution, retail, and restaurants. And from a value-added standpoint, these may be by far more important than raw food production.

[5] The carbon footprints of various foodstuffs depend, of course, on more than just the miles traveled. Transportation from farm to market usually accounts for only about 10 percent of carbon releases. Equally and sometimes more important considerations are the production methods chosen, the type of packaging used, the degree of processing required, the energy efficiency of the marketplace, and the transportation mode chosen by a shopper to get to market. But because local foods usually are associated with low-tech production, minimal packaging and processing, nearby markets mindful of energy efficiency, and shoppers who walk, bike, or drive high-efficiency vehicles, the conclusion that local food brings down carbon footprints is not unreasonable.

Moreover, studies purporting to demonstrate the irrelevance of "food miles" are deeply flawed. For example, a recent New Zealand study that claimed to prove that U.K. residents eating local lamb wound up generating four-times the carbon they would had they instead imported New Zealand lamb never analyzed a sustainable local lamb-production model. Nor did the study's underwriting -- by the New Zealand Lamb Export Association -- inspire confidence in its objectivity. See Michael H. Shuman, "On the Lamb," 10 August 2007, www.ethicurian.com .

[6] "The nutrients in most fruits and vegetables start to diminish as soon as they're picked, so for optimal nutrition, eat all produce within 1 week of buying," says Preston Andrews, PhD, a plant researcher and associate professor of horticulture at Washington State University. Sarah Burns, "Nutritional Value of Fruits, Veggies Is Dwindling," www.nbcnews.com, 9 July 2010.

[7] Michael Pollan, *In Defense of Food: An Eater's Manifesto* (New York: Penguin, 2008).

a reminder about the health value of purchasing food from producers that consumers know and trust.

- ***More Civic Engagement*** – As author Bill McKibben argues, a farmers market is fundamentally different from a typical supermarket (let alone a Wal-Mart Supercenter).[8] A supermarket is about finding and purchasing foods as quickly and efficiently as possible. A farmers market is about consumers chatting among, learning from, and developing relationships with local food producers, and about neighbors interacting with one another. An entire sociology literature underscores that communities characterized by local business result in greater civic welfare, less social strife, and greater equality.[9]

The only plausible argument not to promote local food is a concern that local food sometimes costs more than mainstream food. But two points are worth making here. An important reason local food prices are relatively high today is that demand exceeds supply. This reflects, moreover, a lack of distribution and aggregation infrastructure reducing efficiencies and cost savings in the local food system. As local food businesses grow and spread, particularly infrastructure businesses like food hubs, prices will begin to adjust downward.

Second, economic success does not just occur with provision of the lowest price goods and services. No one, for example, would criticize Starbucks as a failed model because its lattes are the most expensive in town. Consumers of all incomes are not only looking for the lowest priced food but also the *best value* for a given price. And in many ways, consumers – even low-income consumers – are finding that local food, even if it's nominally pricier, delivers better value.[10] A recent study by the USDA found that local

[8] Bill McKibben, *Deep Ecology: The Wealth of Communities and the Durable Future* (New York: St. Martin's Giffen, 2008).

[9] See, e.g.: C. Wright Mills and Melville Ulmer, "Small Business and Civic Welfare," in *Report of the Smaller War Plants Corporation to the Special Committee to Study Problems of American Small Business*, Document 135. U.S. Senate, 79th Congress, 2nd session, February 13. (Washington, DC: U.S. Government Printing Office, 1946); and Thomas A. Lyson, "Big Business and Community Welfare: Revisiting A Classic Study," monograph (Cornell University Department of Rural Sociology, Ithaca, NY, 2001), p. 3.

[10] A recent study found that 500 South Carolina consumers were willing to pay 27% more for locally grown produce and 23% more for local animal products. Carlos E. Carpio and Olga Isengildina-Massa, "Intermediate Economic Evaluation of the South Carolina Agricultural Marketing and Branding Campaign," working paper, March 2008. Another study of residents in Maine, New Hampshire, and Vermont found that 17 to 40% of consumers in each state were willing to pay two dollars more to buy a locally produced five-dollar food item. Kelly L. Giraud, Craig A. Bond, and Jennifer J. Keeling, "Consumer Preferences for Locally Made Specialty Products Across Northern New England" (Department of Resource Economics and Development, Durham, NH), p. 20. See also: "Decomposing Local: A Conjoint Analysis of Locally Produced Foods," Kim Darby, Marvin Batte, Stan Ernst and Brian Roe. American Journal of Agricultural Economics, 2008, vol. 90, issue 2, pp. 476-486; Gretchen Nurse, Yuko Onozaka, and Dawn Thilmany McFadden, "Understanding the Connections Between Consumer Motivations and Buying Behavior: The Case of the Local Food System Movement," Selected Paper, Southern Agricultural Economics Association 2010 Annual Meeting. http://ageconsearch.umn.edu/handle/56494 (Access date: November 5, 2010); and J.K. Bond, D. Thilmany, et al, "Direct Marketing of Fresh Produce: Understanding Consumer Purchasing Decisions," Choices: The Magazine of Food, Farm, and Resource Issues, American Agricultural Economics Association, Vol. 21 (2006), pp. 229-235.

food often provides the cheapest nutrients available, and local food markets like New Seasons have thrived in low-income communities because they provide better bargains than the processed foods available from corner stores and bodegas.[11]

Even on a price basis, moreover, the economics of local food is steadily improving. At least five trends are likely to help local food improve its competitiveness over the next decade:

- ***Distributional Inefficiency*** – While the production costs of food can be brought down by moving factories to low-wage regions with few regulations, global distribution of food is becoming increasingly inefficient. Economist Stewart Smith of the University of Maine, for example, estimates that a dollar spent on a typical foodstuff item in the year 1900 wound up giving 40 cents to the farmer, with the other 60 cents split between inputs and distribution.[12] Today, about seven cents of every retail food dollar goes to the farmer, rancher, or grower, and 73 cents goes toward distribution. The distributional inefficiency is especially great for perishable foodstuffs, where swift delivery is imperative. Whenever the distribution cost greatly exceeds the production cost, there are opportunities for cost-effective localization. Not just in the United States, but worldwide, local distribution offers opportunities for reducing the need for, and expense of, every component of distribution, including transportation, refrigeration, packaging, advertising, insurance, and middle people. The Oklahoma Food Coop, for example, is a no-frills internet-based food distribution company that has reduced distribution costs to 18 cents on the dollar.
- ***Rising Energy Prices*** – Long-distance food distribution will become more costly still when, as most analysts expect, global oil prices rise.[13] Adding to these market forces are political pressures to enact carbon taxes to slow global climate disruption. Because foodstuffs have a relatively low value per unit weight (except for a few products like expensive wines and spices), they are disproportionately vulnerable to rising energy prices and energy taxes.
- ***Homeland Security*** – Global concerns about terrorism have focused the attention of security officials on scenarios that national food supplies could be contaminated or destroyed.[14] They are recognizing that the shorter supply lines

[11] Andrea Carlson and Elizabeth Frazao, USDA, "Are Healthy Foods Really More Expensive? It Depends on How You Measure the Price," Economic Information Bulletin No. (EIB-96) 50 pp, May 2012.

[12] Stewart Smith, e-mail to Michael Shuman, 2 December 2005, updating Stewart Smith, "Sustainable Agriculture and Public Policy," *Maine Policy Review*, April 1993, pp. 68–78.

[13] See, e.g., Christopher Steiner, *$20 Per Gallon: How the Inevitable Rise in the Price of Gasoline Will Change Our Lives for the Better* (New York: Grand Central Publishing, 2009).

[14] Brian Halweil, "Home Grown: The Case for Local Food in a Global Market" (Washington, DC: Worldwatch Institute, 2003) (Worldwatch Paper #163).

and community self-reliance that come with local food can reduce these security risks. This is translating into a recalibration of government policies to impose higher insurance premiums on global food producers and to offer more assistance to local food businesses. Professor David Orr of Oberlin College is consulting with the Joint Chiefs of Staff at the White House on the connection between distributed and self-reliant local food on the one hand and energy systems and national security on the other.

- ***Telecommunications*** – The spread of the internet, affordable computers, and mobile phones provide local food entrepreneurs with information about market opportunities that once was available only to larger companies. Even the smallest food and farm entrepreneurs are experimenting with no or low-cost social media tools to successfully reach their customers.

- ***Competitive Models*** – A fifth factor increasing the competitiveness of local food is that local food businesses themselves are learning from their global brethren how to compete more effectively. In fact, in *every* food category of the North American Industrial Classification System (NAICS), there are more examples of successful small business than examples of successful large business. Even in relatively centralized sectors, like poultry production, there are compelling examples of small-scale success throughout the United States that can provide guidance to local food entrepreneurs. As pointed out in a recent study on *Community Food Enterprise*, locally owned businesses are deploying more than a dozen strategies – such as low-cost technology, the internet, vertical integration, consumer ownership – to compete effectively against large-scale players.[15] Moreover, geographically dispersed networks of local food businesses are forming – creating joint procurement cooperatives, for example -- that are improving their economies of scale. Many local food advocacy groups and intermediaries are deploying peer learning strategies and network "communities of practice" to more effectively diffuse innovation for model replication. The Wallace Center for Sustainable Agriculture, for example, now has regular webinars to education hundreds of local-food professionals across the country.

Given these myriad benefits of local food, a growing number of regions and communities are evaluating carefully how they can accelerate this trend and fully realize the potential benefits. This paper evaluates the potential for the state of Michigan. Specifically, it aims to answer three questions:

- What are the contours of Michigan's existing food economy?

- What would be the economic impacts of a serious shift toward food localization?

- How much additional capital would be required for this shift?

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[15] See Michael Shuman et al., *Community Food Enterprises* (Wallace Center, December 2009).

To answer these questions, this paper examines a 20% "local shift" in the state of Michigan. What we mean by a "20% shift" is that the localization gap in each food-business sector—that is, the gap between the level of business that exists today (using 2010 data) and the level needed to achieve self-reliance in that sector—is closed a fifth of the way. We believe that this goal is big enough to inspire regional mobilization of the business, policymaking, and grassroots communities, but not so big as to be impractical.

I. The Michigan Food System

A comprehensive picture of the Michigan economy is possible using IMPLAN, the Minnesota Input-Output Model deployed extensively by economic development agencies nationwide. The most recent data available from IMPLAN, for 2010, show that the total value added for the entire state economy – the regional equivalent of the Gross Domestic Product (GDP) – is about $393 billion per year. Of that, $219 billion goes to employees in wages, $26 billion to business proprietors as income, and $122 billion to property holders as rent, interest, or profit.[16] Another $27 billion is paid by Michigan businesses in state and local taxes. On the demand side, households spend $219 billion per year, state and local governments purchase $50 billion worth of goods and services, and the federal government purchases another $13 billion.

IMPLAN is helpful in drawing an accurate, comprehensive picture of the demand and supply sides of specific sectors of the economy. IMPLAN carves up the universe of business into 432 categories, some of which combine the 1,100 categories of the North American Industrial Classification System (NAICS). We focus here only on 52 IMPLAN categories that relate to food either exclusively or *primarily*.[17] These categories include primary production, processing, retail sales, and food services like restaurants. (IMPLAN does not include specific categories for food distribution or wholesaling.) Food, depending on which yardstick one uses, accounts for 5% to 10% of the state economy.

On the demand side, IMPLAN includes not only consumer demand but also demand by businesses, public agencies, and nonlocal purchasers. Chart 1 presents the food demand picture portrayed by IMPLAN, and drawn from several dozen federal, state, and local data sources. Household demand for food in Michigan is $11.6 billion (about 5% of total household demand). State and local government purchases of food are another $752 million, everything from school lunches and prison meals to vending machines and commissaries in public buildings. IMPLAN's accounting system also considers purchases outside Michigan of local products as a "demand." Other parts of the United States are demanding $15.2 billion of the state's food products and services, and the rest of the world another $1.9 billion.

[16] Property here includes real, tangible, and financial property.

[17] Some judgment calls here are tricky. We do not include Tobacco and Cotton, but we do include Greenhouses, Forestry, and Hunting.

Chart 1
Total Food Demand in Michigan – IMPLAN Estimates (2010)

	Food Demand	Total Demand
Households	$11,550,008,579	$219,883,356,678
Federal Government	$11,433,376	$10,397,430,944
State & Local Government	$751,947,116	$46,076,125,002
Capital	$8,970,092	$36,448,978,318
Inventory	$145,707,676	$1,990,363,085
Domestic Exports	$15,224,422,985	$182,797,886,062
Foreign Exports	$1,887,009,205	$56,327,373,950
	$29,579,499,030	$553,921,514,039

Chart 2 gives a picture of the local demand for foodstuffs made in Michigan. The first column presents existing local demand, the second column presents the additional demand needed to achieve self-reliance (where local supply can meet local demand), and the third column presents the sum of these columns – that is, the amount of production needed to meet local demand. [18] It shows that the total in-state demand for food is $33 billion.

A good point of comparison is another federal database, the Consumer Expenditure Survey (CES). The most recent version (2011) shows that the typical "consumer unit" spends $6,458 on food -- $3,838 on food eaten at home and $2,620 on eating out. Another $456 is spent on alcoholic beverages. A "consumer unit" is roughly equivalent to a "household," and Michigan has 3.8 million households. So the total amount of money that Michigan households spend on food and drink is about $26.3 billion. The difference between this number and $33 million from IMPLAN, $6.7 billion, is the spending by businesses and government entities in state. Again, the CES covers only households.

Chart 3 summarizes the top exports by Michigan food businesses. The biggest export items (by value) are manufactured breakfast cereals ($3.3 billion total domestic and foreign exports). Also high on the list are other manufactured items, including: canned fruits and vegetables ($1.8 billion); processed meat ($1.3 billion); dry or evaporated dairy products ($760 million); soft drinks and ice ($740 million); and bread and bakery products ($559 million). The top exports also include several raw foodstuffs such as grains ($1 billion) and oilseeds ($708 million).

[18] The column titled "Current Spending on Local Production" comes from IMPLAN's assessment of "Institutional Demand." For each section, exports are subtracted. What's left is the spending by households, government entities, and businesses on capital and inventory. The column titled "Additional Production for Self-Reliance" comes from IMPLAN's regional purchasing coefficient (RPC) (defined below), which is the amount of local demand met by local production. The formula 1-RPC yields the additional production needed to meet local demand – or the missing level of production needed for self-reliance.

Chart 2
Total In-State Food Demand (2010)

Sector	Current Spending On Local Production	Additional Production for Self-Reliance	Total Demand For Local Production
Oilseed farming	$8,280,623	$167,576,217	$175,856,840
Grain farming	$20,299,741	$624,300,982	$644,600,723
Vegetable and melon farming	$224,637,663	$300,411,016	$525,048,679
Fruit farming	$152,868,329	$493,861,521	$646,729,850
Tree nut farming	$64,788	$133,445,808	$133,510,595
Greenhouse, nursery, and floriculture production	$123,073,953	$315,558,242	$438,632,195
Tobacco farming	$0	$0	$0
Cotton farming	$0	$18,297,635	$18,297,635
Sugarcane and sugar beet farming	$1,642,253	$67,266,814	$68,909,066
All other crop farming	$4,487,912	$313,131,104	$317,619,016
Cattle ranching and farming	$720,888	$486,146,439	$486,867,327
Dairy cattle and milk production	$13,042,238	$49,504,214	$62,546,452
Poultry and egg production	$23,147,337	$294,555,784	$317,703,121
Animal production, except cattle and poultry and eggs	$79,220,424	$187,382,061	$266,602,485
Forestry, forest products, and timber tract production	$492	$179,384,380	$179,384,872
Commercial logging	$5,530	$31,670,595	$31,676,125
Commercial Fishing	$4,338,969	$248,730,969	$253,069,938
Commercial hunting and trapping	$55,685,462	$40,233,158	$95,918,619
Support activities for agriculture and forestry	$11,768,207	$274,947,221	$286,715,429
Dog and cat food manufacturing	$27,356,200	$717,960,124	$745,316,323
Other animal food manufacturing	$99,360,139	$419,644,808	$519,004,947
Flour milling and malt manufacturing	$34,960,961	$462,645,669	$497,606,630
Wet corn milling	$0	$594,189,164	$594,189,164
Soybean and other oilseed processing	$10,246,423	$682,119,719	$692,366,142
Fats and oils refining and blending	$25,543,932	$265,964,454	$291,508,387
Breakfast cereal manufacturing	$397,394,440	$72,330,342	$469,724,782
Sugar cane mills and refining	$5,322,087	$201,429,747	$206,751,835
Beet sugar manufacturing	$124,630,533	$139,865,696	$264,496,229
Chocolate and confectionery manufacturing from cacao b	$227,504	$90,838,116	$91,065,620
Confectionery manufacturing from purchased chocolate	$58,776,712	$314,100,548	$372,877,261
Nonchocolate confectionery manufacturing	$6,355,613	$227,649,935	$234,005,548
Frozen food manufacturing	$274,112,821	$524,121,623	$798,234,444
Fruit and vegetable canning, pickling, and drying	$309,077,093	$991,564,899	$1,300,641,992
Fluid milk and butter manufacturing	$534,742,203	$118,879,728	$653,621,930
Cheese manufacturing	$70,454,618	$676,776,597	$747,231,214
Dry, condensed, and evaporated dairy product manufactu	$267,920,726	$62,129,973	$330,050,700
Ice cream and frozen dessert manufacturing	$17,290,675	$194,068,671	$211,359,347
Animal (except poultry) slaughtering, rendering, and proc	$601,729,177	$1,982,529,998	$2,584,259,175
Poultry processing	$105,179,614	$1,159,600,202	$1,264,779,816
Seafood product preparation and packaging	$14,207,397	$372,694,078	$386,901,475
Bread and bakery product manufacturing	$352,266,504	$574,048,728	$926,315,232
Cookie, cracker, and pasta manufacturing	$157,644,806	$488,739,321	$646,384,127
Tortilla manufacturing	$34,855,206	$58,524,425	$93,379,631
Snack food manufacturing	$204,150,845	$711,515,934	$915,666,779
Coffee and tea manufacturing	$65,725,601	$234,979,446	$300,705,047
Flavoring syrup and concentrate manufacturing	$1,098,683	$826,976,632	$828,075,315
Seasoning and dressing manufacturing	$48,771,467	$425,328,424	$474,099,891
All other food manufacturing	$32,999,249	$554,020,033	$587,019,282
Soft drink and ice manufacturing	$1,698,437,161	$62,180,563	$1,760,617,724
Breweries	$102,974,762	$758,044,343	$861,019,104
Wineries	$93,692,121	$544,516,337	$638,208,458
Distilleries	$21,929,414	$334,094,747	$356,024,161
Retail Stores - Food and beverage	$4,174,752,468	$313,258,284	$4,488,010,752
Food Service & Drinking	$1,770,594,876	$599,711,027	$2,370,305,902
	$12,468,066,840	$20,983,446,495	$33,451,513,334

Chart 3
Food Exports from Michigan – IMPLAN Estimates (2010)

Description	Domestic Exports	Foreign Exports	Total Exports
Breakfast cereal manufacturing	3,126,674,742	140,447,999	$3,267,122,740
Fruit and vegetable canning, pickling, and drying	1,669,089,495	120,151,062	$1,789,240,558
Animal (except poultry) slaughtering, rendering, and processing	1,113,034,600	193,446,218	$1,306,480,818
Grain farming	706,107,801	327,718,328	$1,033,826,129
Dry, condensed, and evaporated dairy product manufacturing	600,503,378	159,335,238	$759,838,615
Soft drink and ice manufacturing	718,667,808	21,534,019	$740,201,827
Oilseed farming	386,022,547	322,210,264	$708,232,812
Bread and bakery product manufacturing	538,046,856	20,604,477	$558,651,333
Flour milling and malt manufacturing	493,535,833	56,598,586	$550,134,419
Fluid milk and butter manufacturing	505,671,531	20,949,952	$526,621,484
Snack food manufacturing	485,162,201	11,929,214	$497,091,416
Cookie, cracker, and pasta manufacturing	480,308,723	10,600,943	$490,909,666
Greenhouse, nursery, and floriculture production	464,373,694	14,460,992	$478,834,686
Frozen food manufacturing	401,735,682	29,887,687	$431,623,369
Beet sugar manufacturing	382,827,188	47,606,641	$430,433,828
Dairy cattle and milk production	419,956,244	9,355	$419,965,599
Seasoning and dressing manufacturing	343,988,288	16,365,962	$360,354,250
Cheese manufacturing	323,701,697	10,226,701	$333,928,398
Coffee and tea manufacturing	250,560,795	31,125,225	$281,686,020
Poultry and egg production	246,009,308	0	$246,009,308
Confectionery manufacturing from purchased chocolate	218,581,689	6,675,488	$225,257,177
Soybean and other oilseed processing	151,767,173	57,208,880	$208,976,053
All other crop farming	162,633,094	17,338,749	$179,971,842
All other food manufacturing	163,231,401	14,233,050	$177,464,450
Breweries	144,354,806	14,395,420	$158,750,226
Vegetable and melon farming	82,111,347	52,287,853	$134,399,200
Fats and oils refining and blending	110,640,325	10,554,809	$121,195,134
Commercial logging	40,860,185	43,258,299	$84,118,484
Animal production, except cattle and poultry and eggs	70,066,894	11,391,458	$81,458,352
Support activities for agriculture and forestry	80,378,538	363,373	$80,741,911
Fruit farming	31,526,267	47,199,855	$78,726,123
Retail Stores - Food and beverage	60,240,388	0	$60,240,388
Wineries	51,629,195	6,840,133	$58,469,328
Ice cream and frozen dessert manufacturing	47,059,902	801,607	$47,861,509
Nonchocolate confectionery manufacturing	31,777,310	1,295,568	$33,072,878
Sugar cane mills and refining	24,906,316	792,726	$25,699,042
Other animal food manufacturing	14,062,963	9,631,622	$23,694,584
Food Service & Drinking	18,803,343	3,154,338	$21,957,681
Commercial Fishing	1,330,163	17,634,689	$18,964,852
Dog and cat food manufacturing	16,017,412	1,455,689	$17,473,101
Seafood product preparation and packaging	16,295,648	895,558	$17,191,205
Poultry processing	1,589,902	8,593,582	$10,183,484
Distilleries	5,246,047	3,317,548	$8,563,595
Cattle ranching and farming	8,407,081	4,261	$8,411,341
Forestry, forest products, and timber tract production	3,214,774	992,641	$4,207,415
Tortilla manufacturing	3,519,348	163,330	$3,682,678
Flavoring syrup and concentrate manufacturing	2,674,054	814,474	$3,488,528
Commercial hunting and trapping	2,637,002	0	$2,637,002
Sugarcane and sugar beet farming	1,523,525	319,900	$1,843,425
Chocolate and confectionery manufacturing from cacao beans	1,357,594	54,041	$1,411,635
Tree nut farming	888	131,400	$132,288
	$15,224,422,985	$1,887,009,205	$17,111,432,191

On the supply side, IMPLAN incorporates various federal databases on farmers, self-employed residents, and public employees. As shown in Chart 4, the "food economy" in Michigan currently employs 524,250. More than 60% of the employees work in food service, primarily restaurants. About 15% work in groceries and food retail, 8% in food manufacturing, and 16% in farming and primary food production.

Chart 4
Employment in Michigan Food Businesses (2010)

	Jobs	% Breakdown
Primary Production	83,396	16%
Manufacturing	39,443	8%
Retail	80,233	15%
Food Service	321,179	61%
	524,250	100%

Chart 5 (on the next page) provides a more specific breakdown of employment and wages in each food sector.

Chart 6 breaks down the $9.8 billion paid out in wages for food businesses. Food service, responsible for 61% of the jobs, pays only 51% of the wages, reflecting the relatively low pay in the sector. The same is true for farming and primary production, which are responsible for 16% of the jobs but only 7% of the wages. Manufacturing, responsible for 8% of the jobs, pays 22% of the wages, reflecting the higher pay in that sector.

Chart 6
Wages in Michigan Food Businesses (2010)

	Wages	% Breakdown	Average Wage
Primary Production	$716,073,169	7%	$8,586
Manufacturing	$2,122,363,742	22%	$53,809
Retail	$1,991,445,679	20%	$24,821
Food Service	$4,960,140,625	51%	$15,444
	$9,790,023,215	100%	

Chart 5
Food Business Employment in Michigan (2010)

IndustryCode	Description	Employment	Total Employee Compensation
1	Oilseed farming	9,579	$5,166,642
2	Grain farming	22,344	$32,548,733
3	Vegetable and melon farming	2,181	$54,400,246
4	Fruit farming	1,855	$35,964,512
5	Tree nut farming	3	$54,214
6	Greenhouse, nursery, and floriculture productio	4,683	$170,332,153
7	Tobacco farming	0	$0
8	Cotton farming	0	$0
9	Sugarcane and sugar beet farming	5,110	$21,014,673
10	All other crop farming	1,444	$23,307,766
11	Cattle ranching and farming	2,755	$20,941,477
12	Dairy cattle and milk production	9,206	$60,352,188
13	Poultry and egg production	488	$16,351,398
14	Animal production, except cattle and poultry a	8,664	$42,172,165
15	Forestry, forest products, and timber tract proc	272	$3,778,586
16	Commercial logging	3,964	$68,393,944
17	Commercial Fishing	901	$3,813,052
18	Commercial hunting and trapping	494	$2,231,100
19	Support activities for agriculture and forestry	9,454	$155,250,320
41	Dog and cat food manufacturing	39	$2,203,981
42	Other animal food manufacturing	311	$14,257,555
43	Flour milling and malt manufacturing	551	$38,789,757
44	Wet corn milling	0	$0
45	Soybean and other oilseed processing	95	$4,368,415
46	Fats and oils refining and blending	122	$5,094,807
47	Breakfast cereal manufacturing	4,098	$315,261,139
48	Sugar cane mills and refining	56	$4,987,638
49	Beet sugar manufacturing	1,161	$55,670,780
50	Chocolate and confectionery manufacturing fro	3	$74,912
51	Confectionery manufacturing from purchased c	718	$38,159,496
52	Nonchocolate confectionery manufacturing	130	$2,646,822
53	Frozen food manufacturing	2,333	$113,405,411
54	Fruit and vegetable canning, pickling, and dryi	4,422	$229,227,783
55	Fluid milk and butter manufacturing	2,134	$137,359,894
56	Cheese manufacturing	614	$31,895,536
57	Dry, condensed, and evaporated dairy product	1,108	$89,423,866
58	Ice cream and frozen dessert manufacturing	242	$10,624,603
59	Animal (except poultry) slaughtering, rendering	5,051	$237,879,791
60	Poultry processing	654	$24,151,808
61	Seafood product preparation and packaging	120	$7,881,049
62	Bread and bakery product manufacturing	6,167	$190,829,376
63	Cookie, cracker, and pasta manufacturing	1,285	$97,333,252
64	Tortilla manufacturing	202	$5,622,241
65	Snack food manufacturing	1,059	$52,265,514
66	Coffee and tea manufacturing	563	$31,902,050
67	Flavoring syrup and concentrate manufacturing	71	$3,568,853
68	Seasoning and dressing manufacturing	763	$55,143,150
69	All other food manufacturing	697	$31,258,265
70	Soft drink and ice manufacturing	3,793	$256,119,446
71	Breweries	404	$15,083,490
72	Wineries	449	$16,722,839
73	Distilleries	30	$3,150,221
324	Retail Stores - Food and beverage	80,233	$1,991,445,679
413	Food services and drinking places	321,179	$4,960,140,625
	TOTAL	524,250	$9,790,023,215

Chart 7 breaks out the $19.1 billion in economic value added by Michigan food businesses. "Value added" is essentially a local equivalent of the Gross Domestic Product (GDP). Because of wage differences, relatively high "value" comes from manufacturing, and relatively low value comes from retail. Food service generates the greatest percentage of value, because it is such a big part of the food economy.

Chart 7
Value Added in Michigan Food Businesses (2010)

	Value Added	% Breakdown
Primary Production	$2,866,065,156	15%
Manufacturing	$4,821,402,093	25%
Retail	$3,281,711,609	17%
Food Service	$8,104,770,386	42%
	$19,073,949,243	100%

Chart 8 illuminates what we know about local demand versus local production in Michigan, according to IMPLAN. The second column, labeled Leakage, shows what percentage of local demand is lost to imports of outside goods and services. The first column, labeled "Self-Reliance," is the inverse of the second column. Note how few categories in the state even reach 50% self-reliance. The sectors where more than half of demand is met through local production are: vegetables and melons (52% self-reliance), sugar cane and sugar beets (75%), dairy cattle and milk (95%), farm animals (except cattle and poultry) (62%), breakfast cereals (79%), sugar beet processing (58%), milk and butter production (87%), dry dairy products (87%), soft drinks and ice (97%), grocery stores (93%), and restaurants (96%). In roughly four-fifths of the food sectors, the leakage is above 50% -- often near 100%.

Food localization can be understood as reducing the level of leakage in each food sector and increasing, commensurately, the level of self-reliance. Finding one number that accurately expresses the degree of food leakage turns out to be tricky and misleading. Many studies, for example, highlight how little primary production is consumed locally. But a much higher percentage of food manufacturing is typically consumed locally, and nearly all food service is consumed locally.[19] Inclusion of these data points suggests a lower level of systemic leakage.

Perhaps the best number expressing the overall leakage of Michigan's food system is the total value of local spending on local food today compared to what total spending would be with complete statewide self-reliance. Returning to Chart 2, those values are 12 billion and $33 billion, respectively. This suggests that the state, by dollar value, is 36% self-reliant in its food system.

[19] An example of a food service consumed nonlocally might be Michigan residents who cross into neighboring states to eat out.

Chart 8
Food Business Leakages (2010)

Description	% Self-Reliant	%Leakage
Oilseed farming	49%	51%
Grain farming	27%	73%
Vegetable and melon farming	52%	48%
Fruit farming	33%	67%
Tree nut farming	0%	100%
Greenhouse, nursery, and floriculture production	36%	64%
Tobacco farming	0%	100%
Cotton farming	0%	100%
Sugarcane and sugar beet farming	75%	25%
All other crop farming	27%	73%
Cattle ranching and farming	44%	56%
Dairy cattle and milk production	95%	5%
Poultry and egg production	12%	88%
Animal production, except cattle and poultry and eggs	62%	38%
Forestry, forest products, and timber tract production	42%	58%
Commercial logging	89%	11%
Commercial Fishing	5%	95%
Commercial hunting and trapping	61%	39%
Support activities for agriculture and forestry	50%	50%
Dog and cat food manufacturing	4%	96%
Other animal food manufacturing	45%	55%
Flour milling and malt manufacturing	22%	78%
Wet corn milling	1%	99%
Soybean and other oilseed processing	19%	81%
Fats and oils refining and blending	23%	77%
Breakfast cereal manufacturing	79%	21%
Sugar cane mills and refining	11%	89%
Beet sugar manufacturing	58%	42%
Chocolate and confectionery manufacturing from caca	0%	100%
Confectionery manufacturing from purchased chocola	15%	85%
Nonchocolate confectionery manufacturing	5%	95%
Frozen food manufacturing	41%	59%
Fruit and vegetable canning, pickling, and drying	31%	69%
Fluid milk and butter manufacturing	87%	13%
Cheese manufacturing	16%	84%
Dry, condensed, and evaporated dairy product manufa	87%	13%
Ice cream and frozen dessert manufacturing	25%	75%
Animal (except poultry) slaughtering, rendering, and p	32%	68%
Poultry processing	12%	88%
Seafood product preparation and packaging	7%	93%
Bread and bakery product manufacturing	43%	57%
Cookie, cracker, and pasta manufacturing	33%	67%
Tortilla manufacturing	37%	63%
Snack food manufacturing	27%	73%
Coffee and tea manufacturing	27%	73%
Flavoring syrup and concentrate manufacturing	20%	80%
Seasoning and dressing manufacturing	13%	87%
All other food manufacturing	16%	84%
Soft drink and ice manufacturing	97%	3%
Breweries	13%	87%
Wineries	19%	81%
Distilleries	9%	91%
Retail Stores - Food and beverage	93%	7%
Food services and drinking places	96%	4%

II. Economic Benefits from a 20% Shift

In the following pages, we sketch what the 20% localization scenario in Michigan would look like *in theory* and what the consequent economic benefits would be. We assume that food exports remain constant. We also assume here no constraints on such expansion, though we return to amend our findings by looking at these constraints in the next section.[20] Instead, the only changes we envision are in the behavior of local purchasers—that is, the buying of local residents, businesses, and government institutions. Increasing local demand then expands the size and number of local food businesses in the region.

Our methodology is to IMPLAN, which draws from state and national economic patterns to model where every dollar of spending goes, and how every dollar is in turn re-spent. IMPLAN can model how a change in demand can lead not only to direct new jobs in expanded business activity, but also how the new spending by this business creates new jobs (*indirect* effects from businesses' supply chains) and how the new spending by new employees in all these businesses (both expanding food businesses and supply-chain businesses) create even more new jobs (*induced* effects). We "shock" the existing economic system of Michigan with new local production, and then look at the consequent impacts on jobs, wages, value added, and taxes.

A hypothetical example illustrates what a 20% shift looks like.[21] (The following numbers are made up.) Suppose breweries in Michigan were producing $100 million worth of beer, $10 million of which was sold in state. Further suppose total demand in the state for beer was $200 million, which means that the state was importing $190 million worth of beer. If all local production went to local demand, total self-reliance would mean that in-state breweries could expand by $100 million in annual output. But since we assume that exports are constant – in this case $90 million – potential output expansion is actually $190 million. Getting 20% of the way to this would imply $38 million of new output.

Chart 9 below summarizes the results of the IMPLAN model after ramping up the demand for local production in each of the 52 food-related sectors in Michigan.[22] A

[20] Potential constraints include climate, land, labor, capital, technology, and consumer behavior.

[21] Formally, the Regional Purchasing Coefficient (RPC) within IMPLAN estimates how much of Total Gross Demand is currently met by local industry. The demand figure includes both local and nonlocal consumption. Multiplying Total Gross Demand by 1-RPC shows how much additional industry is needed to meet local demand (without reducing production for export).

[22] One limitation of IMPLAN, noted later, is that by increasing local demand for a given commodity, the model shows the impact of a typical business producing that commodity – not necessarily a local owned business. Thus, the model tends to understate the likely impacts. The model also says nothing about whether existing businesses expand production or new businesses are created.

total of 42,519 jobs would be created – 18,412 directly in new food businesses, 14,001 through new supply-chain spending (indirect effects), and 10,106 through new spending by employees in these direct and supply-chain jobs (induced effects). To put this in perspective, these jobs would be able to put one-in-ten unemployed residents of the state back to work.[23] Additionally, the 20% shift would generate $1.5 billion in new annual wages and $2.9 billion in additional value-added.

Chart 9
Impacts of a 20% Shift for Michigan (2010)

ImpactType	Employment	Wages	Value Added	Output	Businesses Taxes
Direct Effect	18,412	$553,415,034	$1,057,589,508	$4,037,257,207	$100,791,161
Indirect Effect	14,001	$575,223,968	$1,063,373,396	$2,052,374,530	$85,510,885
Induced Effect	10,106	$402,028,498	$737,324,784	$1,193,994,959	$69,186,556
Total Effect	42,519	$1,530,667,499	$2,858,287,688	$7,283,626,696	$255,488,602

Chart 9 also shows that the 20% shift would generate an additional $255 million in annual state and local tax collection. That means that an annual government investment at somewhat below that level, if it achieves the 20% shift, could be fiscally justified.

Chart 10 presents a detailed roster of the job impacts in all the food sectors, compared to the existing number of jobs. Various degrees of local impact are also shown, in case the reader prefers a more or less ambitious goal than 20%.

[23] According to the Michigan Department of Technology, Management, and Budget, as of September 2012, the state reported that of a labor force of 4.7 million, 432,000 people were unemployed—that is, an unemployment rate of 9.3%, which is above the national average.

Chart 10
Job Impacts of Various Shifts in the Michigan Food Sectors (2010)

Category	Current Jobs	New Jobs with 100% Shift*	New Jobs 20% Shift*	New Jobs with 10% Shift*	New Jobs with 5% Shift*
Oilseed farming	9,579	4,920	984	492	246
Grain farming	22,344	14,474	2,895	1,447	724
Vegetable and melon farming	2,181	1,729	346	173	86
Fruit farming	1,855	3,344	669	334	167
Tree nut farming	3	1,475	295	148	74
Greenhouse, nursery, and floriculture produc	4,683	2,407	481	241	120
Tobacco farming	0	0	0	0	0
Cotton farming	0	0	0	0	0
Sugarcane and sugar beet farming	5,110	3,796	759	380	190
All other crop farming	1,444	1,959	392	196	98
Cattle ranching and farming	2,755	6,568	1,314	657	328
Dairy cattle and milk production	9,206	2,941	588	294	147
Poultry and egg production	488	605	121	61	30
Animal production, except cattle and poultry	8,664	9,437	1,887	944	472
Forestry, forest products, and timber tract pr	272	381	76	38	19
Commercial logging	3,964	434	87	43	22
Commercial Fishing	901	7,430	1,486	743	371
Commercial hunting and trapping	494	316	63	32	16
Support activities for agriculture and forestry	9,454	12,430	2,486	1,243	622
Dog and cat food manufacturing	39	573	115	57	29
Other animal food manufacturing	311	531	106	53	27
Flour milling and malt manufacturing	551	444	89	44	22
Wet corn milling	0	0	0	0	0
Soybean and other oilseed processing	95	239	48	24	12
Fats and oils refining and blending	122	301	60	30	15
Breakfast cereal manufacturing	4,098	610	122	61	30
Sugar cane mills and refining	56	226	45	23	11
Beet sugar manufacturing	1,161	321	64	32	16
Chocolate and confectionery manufacturing f	3	15	3	1	1
Confectionery manufacturing from purchased	718	1,152	230	115	58
Nonchocolate confectionery manufacturing	130	406	81	41	20
Frozen food manufacturing	2,333	1,707	341	171	85
Fruit and vegetable canning, pickling, and dry	4,422	2,208	442	221	110
Fluid milk and butter manufacturing	2,134	453	91	45	23
Cheese manufacturing	614	847	169	85	42
Dry, condensed, and evaporated dairy produc	1,108	160	32	16	8
Ice cream and frozen dessert manufacturing	242	364	73	36	18
Animal (except poultry) slaughtering, renderi	5,051	5,153	1,031	515	258
Poultry processing	654	4,386	877	439	219
Seafood product preparation and packaging	120	914	183	91	46
Bread and bakery product manufacturing	6,167	3,546	709	355	177
Cookie, cracker, and pasta manufacturing	1,285	771	154	77	39
Tortilla manufacturing	202	329	66	33	16
Snack food manufacturing	1,059	904	181	90	45
Coffee and tea manufacturing	563	413	83	41	21
Flavoring syrup and concentrate manufacturi	71	299	60	30	15
Seasoning and dressing manufacturing	763	839	168	84	42
All other food manufacturing	697	758	152	76	38
Soft drink and ice manufacturing	3,793	620	124	62	31
Breweries	404	1,138	228	114	57
Wineries	449	1,244	249	124	62
Distilleries	30	241	48	24	12
Retail Stores - Food and beverage	80,233	3,256	651	326	163
Food services and drinking places	321,179	19,347	3,869	1,935	967
Non-Food Direct	-	268	54	27	13
Non-Food Indirect	-	40,097	8,019	4,010	2,005
Non-Food Induced	-	42,871	8,574	4,287	2,144
Total	524,250	212,596	42,519	4,287	2,144

*Includes Indirect & Induced Jobs in Those Sectors

Chart 11 summarizes the jobs impacts by broad sectors: farming and animal growing (direct jobs); food manufacturing (direct jobs); food service (direct jobs); non-food (direct jobs); indirect (all sectors); and induced (all sectors). Relatively few new jobs come from food service, because the state already has a full array of local grocery stores and restaurants. A relatively large number of new jobs come from expanded primary production of fruits, vegetables, grains, and domestic animals.

One important insight from Chart 11 is that the common assumption that most of the jobs resulting from food localization pay below-average wages is misleading. More than half of the jobs come from induced and indirect effects spread even throughout the economy and thus pay average wages. About 14 percent of the new jobs are in high-wage manufacturing. Only a minority of the jobs in farming and food service pay below-average wages.

Chart 11
Summary Job Impacts of a 20% Shift for Michigan (2010)

	Jobs	Percentage
Farming & Animal Raising - Direct	9,513	22%
Food Manufacturing - Direct	6,081	14%
Food Service - Direct	2,764	7%
Nonfood - Direct	54	0%
Indirect - All Sectors	14,001	33%
Induced - All Sectors	10,106	24%
	42,519	100%

Among the top indirect jobs are support activities for farming, animal production, wholesale trade, trucking, and real estate. Among the top induced jobs are restaurants, health services, and retail.
Charts 12 and 13 (on the following pages) look at the "Top 40" direct job opportunities, ranked by jobs and wages, respectively. These rankings are important, because they indicate what the priorities for localization initiatives should be. Based on these rankings, the top six food localization priorities for Michigan, suggested by the data, are:

- *Farming* – There is the potential for new jobs from growing grains (2,224 jobs), fruit (567 jobs), nursery trees and plants (451 jobs), oilseeds (340 jobs), tree nuts (295 jobs), vegetables and melons (284 jobs), and all other crops (314 jobs). Another 1,347 jobs could come from agricultural support activities, such as soil preparation, animal breeding, and seed development.

- *Value-Adding Manufacturing* – The directly grown items above could provide inputs for various well-paying manufacturing enterprises, including: local bakeries (697 jobs); canned fruits and vegetables (420 jobs); frozen food (323 jobs); wineries (241 jobs); confectionary products (229 jobs); breweries (227

jobs); snack foods (178 jobs); seasonings and dressings (163 jobs jobs); cookies, crackers, and pasta (151 jobs); and soft drinks and ice (105 jobs).

- *Meat and Poultry* – If land and training are available, there is the potential for new jobs from: raising animals like pigs, sheep, and goats (853 jobs); raising cattle (683 jobs), and slaughtering these animals in the state (937 jobs). There are additional jobs possible from raising poultry and eggs (100 jobs), and slaughtering them locally (858 jobs).

- *Dairy* – There are modest job opportunities for raising more dairy cattle (70 jobs), along with value-adding manufacturing of milk and better (63 jobs), and ice cream and frozen desserts (71 jobs).

- *Food Service* – Even though Michigan is rich in food stores, the local demand is so large that many more jobs are possible in restaurants (2,435 jobs) and grocery stores (329 jobs). These gaps often fall in low-income urban or rural settings, what are commonly known as "food deserts."

- *Seafood* – Taking better advantage of the Great Lakes, Michigan could create new jobs in fishing (1,444 jobs) and seafood preparation (182 jobs).

Chart 12
Top 40 Opportunities from a 20% Shift for Michigan – By Direct Jobs (2010)

Food services and drinking places	2,435
Grain farming	2,224
Commercial Fishing	1,444
Support activities for agriculture and forestry	1,347
Animal (except poultry) slaughtering, renderin	937
Poultry processing	858
Animal production, except cattle and poultry a	853
Bread and bakery product manufacturing	697
Cattle ranching and farming	683
Fruit farming	567
Greenhouse, nursery, and floriculture producti	451
Fruit and vegetable canning, pickling, and dry	420
Sugarcane and sugar beet farming	340
Oilseed farming	339
Retail Stores - Food and beverage	329
Frozen food manufacturing	323
All other crop farming	314
Tree nut farming	295
Vegetable and melon farming	284
Wineries	241
Confectionery manufacturing from purchased	229
Breweries	227
Seafood product preparation and packaging	182
Snack food manufacturing	178
Seasoning and dressing manufacturing	163
Cheese manufacturing	162
Cookie, cracker, and pasta manufacturing	151
All other food manufacturing	148
Breakfast cereal manufacturing	118
Dog and cat food manufacturing	114
Soft drink and ice manufacturing	104
Poultry and egg production	100
Nonchocolate confectionery manufacturing	81
Coffee and tea manufacturing	80
Flour milling and malt manufacturing	78
Other animal food manufacturing	77
Commercial logging	73
Ice cream and frozen dessert manufacturing	71
Dairy cattle and milk production	70
Forestry, forest products, and timber tract pro	69

Chart 13
Top 40 Opportunities from a 20% Shift for Michigan – By Direct Wages (2010)

Total	Total Wages	Average Wage
Animal (except poultry) slaughtering, rende	$46,672,375	$49,817
Food services and drinking places	$41,189,649	$16,913
Greenhouse, nursery, and floriculture produ	$33,835,166	$75,092
Fruit farming	$33,794,966	$59,606
Poultry processing	$33,709,766	$39,308
Support activities for agriculture and forestı	$32,102,239	$23,833
Fruit and vegetable canning, pickling, and	$23,007,137	$54,831
Bread and bakery product manufacturing	$22,824,893	$32,757
Vegetable and melon farming	$19,602,141	$69,138
Frozen food manufacturing	$16,651,548	$51,495
Confectionery manufacturing from purchas	$12,947,820	$56,453
All other crop farming	$12,818,023	$40,837
Seafood product preparation and packagin	$12,689,695	$69,857
Seasoning and dressing manufacturing	$12,488,533	$76,711
Cookie, cracker, and pasta manufacturing	$12,190,781	$80,518
Commercial Fishing	$12,158,057	$8,422
Grain farming	$10,495,339	$4,719
Retail Stores - Food and beverage	$9,714,624	$29,519
Breakfast cereal manufacturing	$9,667,164	$81,846
Wineries	$9,468,203	$39,316
Snack food manufacturing	$9,282,723	$52,223
Breweries	$9,112,897	$40,225
Tree nut farming	$8,951,786	$30,344
Cheese manufacturing	$8,906,206	$54,981
Soft drink and ice manufacturing	$7,515,664	$71,952
All other food manufacturing	$7,019,944	$47,497
Dog and cat food manufacturing	$6,895,293	$60,269
Flour milling and malt manufacturing	$5,790,168	$74,404
Cattle ranching and farming	$5,654,524	$8,284
Distilleries	$5,396,055	$112,985
Animal production, except cattle and poult	$5,089,962	$5,968
Poultry and egg production	$5,088,672	$50,714
Coffee and tea manufacturing	$4,828,557	$60,011
Fluid milk and butter manufacturing	$4,317,597	$68,080
Sugar cane mills and refining	$4,014,157	$94,634
Other animal food manufacturing	$3,766,725	$48,624
Ice cream and frozen dessert manufacturir	$3,318,021	$46,479
Flavoring syrup and concentrate manufactu	$2,920,201	$53,502
Oilseed farming	$2,724,859	$8,026
Beet sugar manufacturing	$2,519,307	$50,607

There are many other benefits from a 20% shift that should be noted. Among the non-economic benefits that might be difficult to quantify, but nevertheless are real, are those mentioned earlier: greater environmental stewardship and smaller carbon footprints; improved public health; and a richer civic life. Moreover, there are other *economic* benefits:

- ***Branding*** – As the epicenter of a local food renaissance, Michigan would be creating a powerful new magnet for tourism.

- ***Attraction & Retention*** –Becoming a dynamic region that naturally attracts and retains non-local businesses because of local economic richness and vitality – Richard Florida's notion of a creative economy –is economically valuable.

- ***Entrepreneurship*** – Nearly all of the food businesses in the region right now are small (exceptions include very large food-processing companies). Indeed, except for a few food-processing sectors, the vast majority of food enterprises, such as farms and food service operations, can be started by a good entrepreneur with modest levels of capital. The 20% shift would lead to a region-wide entrepreneurship revolution, with positive spillovers throughout the economy.

- ***Public Assistance*** – Increased employment and entrepreneurship would lead to reductions in public assistance outlays in unemployment, food stamps, housing vouchers, health subsidies, and other government supports.

- ***Fiscal Health*** – Reduced government outlays and increased tax revenues would improve the fiscal health of various county and local governments in the region. This would improve their credit worthiness, lower the cost of capital, and reduce payments on existing and future bonds and other debts.

- ***Capital Improvements*** – The 20% shift would also allow more investments in public schools (human capital) and infrastructure (built capital), both of which can add to economic vitality, foster entrepreneurship, and increase the attractiveness of the region to outside business and investors.

- ***Rural Economies*** – The 20% shift provides a stimulus to expand existing farms, diversify farm economies, and revive farms that have gone bankrupt or otherwise been abandoned. By connecting urban demand with nearby rural supply, food localization could lead to a renaissance of rural economic life.

- ***Economic Security*** – Diversification of the local food system could help inoculate the region against sudden cutoffs in food that could occur because of contamination, war, terrorism, or global shortages.

III. From Possible to Plausible Economic Benefits

The previous section described the jobs and other benefits that are *possible* with 20% localization. But not all these jobs are *plausible*. Among the challenging constraints are:

- Can the soil, climate, and water availability in Michigan support all the crops envisioned?
- Is enough land available, of the right quality, for additional farming and grazing?
- Are there enough entrepreneurs to start up or expand needed local food businesses? Will there be enough new farmers?
- Are there solid business models available for smaller, local food businesses to compete effectively?
- Are consumers prepared to buy more local food, more of the time?
- Is there enough capital available to support a 20% shift? .

While comprehensive answers to these questions are beyond the purview of this paper, we present some short points on the first five questions – and a somewhat deeper analysis on the sixth, capital.

Regarding natural resource constraints, Michigan is a remarkable diverse agricultural state. The late economist Kenneth Boulding once wrote that "anything that exists is possible." And by that criterion, the only crops that do not exist, and therefore would be difficult to expand, are tobacco and cotton, neither of which are really foodstuffs. (We actually assume no growth of jobs in these sectors with a 20% shift.) The only other crop category with a relative small number of jobs is "tree nut farming." A 20% shift would create 699 jobs in this category, and these jobs might well be considered implausible. A more thorough analysis of alternative tree nut farming methods, perhaps in greenhouses, would need to be conducted to understand fully the localization potential of this crop.

Of course, the IMPLAN categories are broad and within each category are items that also may be difficult to localize. For example, while the state might be easily able to ramp up local production of "fruit," it might not be able to grow bananas. Likewise, the state could ramp up local production of fresh water fish from the Great Lakes, but ocean-caught fish. Factors like these underscore why choosing a 20% shift rather than 50% or 75% is sensible. Perfect localization of all items is neither feasible nor smart.

Regarding land constraints, we have found in a dozen other analyses of food localization that this constraint is formidable. In well-developed urban and suburban areas, for example, there is simply not enough land to support land-intensive grain crops and animal grazing. That said, several United Nations reports on urban agriculture have shown how many densely populated cities in the world feed their residents locally. Key to their success are the full deployment of public lands (for animal grazing, for example), highway strips, abandoned properties, leased private properties, rooftops, greenhouses, and building sides.[24] Moreover, part of this challenge can be met by shifting local diets to lower consumption of meat, or at least more consumption of animals that consume fewer resources like chicken and lamb. As a study region gets larger and more rural areas are included, however, these land constraints become less severe. And overall Michigan is a state with healthy mix of urban and rural areas.

Regarding human capital constraints, it is important to distinguish between entrepreneurship and workforce challenges. Most food sector jobs – in farming, manufacturing, and service – are relatively low skill, which means that generally speaking, at a time of relatively high unemployment like today, filling these jobs should not be very difficult. That said, workforce development programs may be needed to fill some of the food manufacturing jobs, such as new regional slaughtering facilities. Immigration reform may be needed to ease farmworker shortages. Recruiting entrepreneurs who will lead new local food businesses may not be easy, though these challenges would be lessened if many new local food opportunities are seized by *existing* farms or food businesses that choose to expand or diversify. Ultimately, successful food localization must be accompanied by an expansion of entrepreneurship programs at community colleges, private institutions, existing food businesses, and community kitchens. And since many food jobs, such as animal processing and farm work, have long histories of labor abuse, it is critically important that expansions in these sectors be done with vigilance toward strong labor standards.

A particularly important, and difficult, part of entrepreneurship training is to recruit new farmers. In the competitive world of high-tech agriculture, today's farmers must excel at a wide-range of skills: setting up and managing a farm business, raising crops and animals, selling their outputs directly or through attractive intermediaries, maintaining and using proper tools and technology, and preparing sophisticated financial and marketing plans.[25] The last thing a 20% shift will want to do is to create a new generation of farmers who, like their predecessors, teeter on bankruptcy or require

[24] Care must be taken, of course, to ensure that food is not grown in polluted areas, such as highway strips or brownfield sites, without protective measures. These sites might be best deployed for the growing of salable plants and trees.

[25] The New England Small Farm Institute has prepared extension self-evaluation processes for potential farmers which are available at: http://www.smallfarm.org/main/for_service_providers/tools_and_resources_for_working_with_new_farmers/nesfi_tools_and_resources/dacum_occupational_profile/

massive federal subsidies to survive. New models of farming that emphasize multiple income streams, value-added products, niche marketing, and non-farm production (such as wind-electricity generation) will be necessary to improve their probability of long-term profitability.

Moreover, different demographic groups have different needs. Immigrant populations may have extensive knowledge and experience in traditional farming, but may need support in finance and marketing. Those laid off from a manufacturing job, with no background in agriculture, will require more comprehensive training. Women and nonwhites may especially need support entering a profession that historically has been dominated by white men. The good news is that beginning farmers represent a growing fraction of farmers across the United States, and they are increasingly women and non-whites.[26]

Regarding competitive business models for local food, it's worth pointing out that many mainstream economists are skeptical about localization because they believe that what exists today is the natural result of supply and demand curves efficiently intersecting. Those who believe is the "magic hand" of the marketplace often overlook the myriad public policies, laws, and subsidies that have decidedly tilted markets against local business.[27] Their models assume that consumers have perfect information, even though most turn out to be relatively uninformed about local goods and services (local businesses are far from perfect advertisers). Businesses themselves also are assumed to have perfect information about how to structure themselves efficiently, while in fact innovation diffuses more slowly with local businesses (how many small business proprietors can afford to attend summer programs at Harvard Business School?).

Recall the many factors noted earlier, however, that are likely to shake apart the existing food system. Existing global food systems have high distribution costs, and local competitors are learning how to bring them down. Rising oil prices will hasten this shift. Public demand for local food is rising, in part because of rising concerns about the untrustworthiness of food from distant places like China and the increasingly understood health benefits of eating locally. And local entrepreneurs are making huge strides, some working alone and others working in partnerships and cooperatives, in improving the competitiveness of their local food businesses.

As a rough guide, we turn again to Kenneth Boulding's adage. Are there any food sectors in Michigan that register no activity, which would suggest that expansion is impossible. In fact, there are only two food manufacturing categories that meet this

[26] "Beginning Farmers and Ranchers," Mary Ahearn and Doris Newton. Available from the USDA at http://www.ers.usda.gov/Publications/EIB53/

[27] A forthcoming study by the author, looking at the three largest state economic development programs in fifteen states finds that 90 percent of these programs spend most of their money – often well over 90 percent – on attracting or retaining nonlocal business.

standard. For one, "wet corn milling," where there is no activity now, we assume no activity for the 20% shift. The other, "chocolate and confectionary manufacturing," is responsible for only three new jobs for the 20% shift.

Regarding changing consumer purchasing patterns, to buy more local more of the time, some argue that local food prices will need to come down. The general consensus right now is that these prices are relatively high, because local food demand exceeds local food supply. Demand for locally grown food in recent years has grown dramatically for consumers, businesses, institutions, schools, and municipalities, while local supply has expanded more gradually. A variety of surveys across the country suggest that this expansion of demand has occurred, because consumers are interested in local food and willing to pay more for it. Even some low-income consumers, as noted earlier, are prepared to spend more on local foodstuffs that they perceive to be better values. That said, the basic laws of supply and demand suggest that if prices of local food do come down, more consumers will buy more local food.

But even if local food prices remain constant, more consumers might be local if they were better educated about the health, environmental, and economic benefits of local food, and if they were better aware of which stores were locally owned and which foodstuffs were locally produced. For businesses, institutions, and other mainstream food purchasers this will require greater ease in purchasing bulk food items, prepared foods, and partially processed foods (i.e. chopped or diced vegetables). Aggregation will also be critical to enabling larger-volume buyers to access the products of local producers. For public agencies or institutions such as schools, this will require an overhaul in public procurement practices

Of all the obstacles to the 20% shift, many have come to the conclusion that the biggest by far is capital. Farmers and small businesses always have some difficulty getting credit, but the challenges have become especially acute during the financial crisis since 2008. Even companies with terrific track records for borrowing and repaying are having difficulty today obtaining credit from mainstream banks, thrifts, or credit unions. This underscores the need for new mechanisms for capitalizing local food businesses, and the recent growth of organizations like Investors Circle, Fair Food, Business Alliance for Local Living Economies (BALLE), and Slow Money to mobilize people across the United States to create these mechanisms.

Among the new finance tools for available to bring new capital into new or expanded local food businesses are the following:

- *Targeted CDs* – A few banks, such as Ithaca's Alternatives Credit Union, have agreed to set up special certificates of deposits that fully collateralize loans to high-priority local businesses. Eastern Bank in Boston has a CD that collateralizes a line of credit to Equal Exchange, a local fair-trade company.

- *Coops* – Some coops, like Weaver Street Market in North Carolina, pay their members handsomely to borrow money for capital projects. Others, like Coop Power in western Massachusetts, invest some member capital in supplier businesses. The La Montanita Grocery Coop in New Mexico has created a revolving loan fund so that members' capital can support local farmers and food processors. The Twin Pines Cooperative Foundation, based in northern California has helped set up foundations across the country so that charitable giving can support the establishment and expansion of local coops.

- *Pre-Purchase*– In most U.S. states, preselling is not regarded as a security, so businesses can raise capital without attorneys by convincing their most loyal customers to make purchases in advance. And even in those states where it may be a security, well-established businesses still can use this technique. Hence, Awaken Café raised most of the $100,000 it needed to open a new store by preselling coffee. Credibles is a pre-selling web site for small food businesses seeking to expand.

- *Sponsorship* – Last year, web sites like Kickstarter and IndieGogo raised more than $100 million for small businesses and projects. Even though all you get for your money is a t-shirt or token of appreciation, you know that thousands of small contributors like yourself are helping to get a big idea off the ground. A new generation of web sites, like Lucky Ant and Community Funded, specifically facilitate local sponsorships.

- *P2P Lending* – Kiva facilitates peer-to-peer lending to microentrepreneurs, mostly in the global South but increasingly in U.S. inner cities, though as a dot-org it only pays back principal. Prosper and the Lending Club, both dot-coms, also pay interest (now averaging close to 10% per year).

- *Investor Networks* – The Local Investment Opportunities Network (LION) of Pt. Townsend brings together local investors and businesses each month to establish "preexisting relationships" that facilitate the circulation of business plans. New LIONs are spreading around the country. Unlike traditional angel-investor networks, where entrepreneurs present their business plans at periodic dinners, LIONs often involve unaccredited (non-wealth) investors.

- *Federal Programs* – Various national programs provide generous tax deductions for local investors who support anti-poverty initiatives through New Markets Tax Credits and provide other benefits to designated Community-Development Corporations (CDCs) and Community Development Financial Institutions (CDFIs). Make sure accredited investors and foundations in your region are fully aware of these opportunities, and encourage them to participate.

- *Program Related Investments*– By law, foundations must give away at least 5% of their assets each year. The other 95% is typically invested in distant stocks and bonds. Are number of foundation are now open to helping local food businesses with some of that 95% (or even just 1%). If these businesses are "program related" and the investment does not succeed, the foundation can apply any losses to fulfill its annual grant-giving obligations.

- *Slow Munis* – Some local governments are considering issuing bonds to finance local food businesses? Properly structured, the interest from these bonds could be tax exempt, and these bonds could be sold locally.

- *Crowdfunding* – Until recently, it has been very expensive to restructure a small business so that it could accept investment from the 99% of non-wealth people in your community who are "unaccredited." But thanks to "crowdfunding reforms" signed into law by President Obama last year, new web sites will soon be set up that bring down the costs of "going public" and allowing unaccredited investors to purchase as much as $2,000 of local stock per company per year.

- *Local Stock Markets* – As crowdfunding spreads, there will be a growing number of local stock purchasers who wish to sell their shares. Mission Markets of New York has a turn-key web platform that enables a community to get started with this immediately.

- *Local Fund* – Pools of capital are preferable to one-off investments because they diversify risk. There are thousands of local-investment pools around the country, most of them linked with local economic-development programs, but nearly all of them are only open to accredited investors. Important exceptions that allow unaccredited investor participation include MountainBizWorks in North Carolina, the New Hampshire Community Loan Fund, and ECDI in Columbus, Ohio. PV Grows in Western Massachusetts is developing a royalty finance model focusing on local food businesses.

- *Investment Clubs* – Neighbors can form their own investment pools via stock clubs. The legal key is that all your decisions have to be made together, as a group. A great example of an investment club focusing on local food businesses is No Small Potatoes, a project of Slow Money Maine.

- *Self-Directed IRAs* – By rolling over tax deferred IRAs or 401k's into a Self-Directed IRA, investors can direct a custodian (for about $200-300 per year) to invest instead in any and all of the items above. The only restriction is that they cannot invest in their own family's business or home.

How much additional capital must these tools shift to finance the 20% shift in Michigan? The 2012 *Statistical Abstract* estimates the "Net Stock of Private Fixed Assets," the aggregate value of the capital assets of different industries.[28] Chart 14 shows these values nationally for four sectors of local food businesses, and then scales them by population for Michigan. Assuming that the food system has a constant relationship between jobs and capital, the additional capital required for the 20% shift is about $3 billion. This number could be higher if new businesses turn out to be more capital intensive.

Chart 14
Capital Requirements for 20% Shift (2010)

Private Assets for Food Businesses ($millions)		
	United States	**Michigan**
Agriculture	$493,000	$15,860
Food Manufacturing	$238,000	$7,656
Food Retail & Wholesale	$154,000	$4,954
Food Services	$269,000	$8,654
Total	$1,154,000	$37,124
Population	307,000,000	9,876,187
Population %		0.03216999
Existing Food Jobs		524,250
Additional Jobs with 20% Shift		42,519
Percent Expansion		8.11%
Additional Capital Requirements		$3,011

There's no question that this capital, in theory, is available in Michigan, as shown in Chart 15. Residents have approximately $256 billion of savings in short-term accounts and $896 billion in long-term accounts. Reallocating 1.2% of the former or 0.34% of the latter could fully finance the businesses needed for the 20% shift.

Of course, for the region to amass $3 billion for local food businesses, it might only need to come up with a small percentage – perhaps 20% -- in equity. This, in turn, could leverage debt to finance the rest.

A growing number of food entrepreneurs are looking for equity or near-equity kinds of finance, which will not put them in further debt. Many of the businesses needed for the 20% shift – meat processing; food manufacturing, packaging, and distribution; food service – cannot be done through small loans. The capital requirements for these enterprises are larger, and the scale requires more experienced entrepreneurs who tend to be more interested in equity or near-equity.

[28] Table 781, for the year 2009. food-related wholesale is assumed to be 10% of the "retail and wholesale category."

Chart 15
Estimated Household & Nonprofit Capital (2010)

	$ million
Short Term Savings	**Michigan**
Checking	$9,717,496,859
Savings	$202,807,144,360
Money Markets	$43,546,325,518
	$256,070,966,737
Long-Term Savings	**Michigan**
Corporate Stock	$247,547,428,537
Corporate Bonds	$72,897,809,207
Mutual Funds	$137,703,231,951
Pension Funds	$396,294,778,081
Insurance Funds	$41,191,573,719
	$895,634,821,495

The exact kind of finance needed by these businesses varies enormously. Some will prefer convertible debt, while others will prefer more active shareholders. Another option, being developed by the Vermont Sustainable Jobs Fund, is royalty financing, where repayment and royalties are tied to monthly revenues or profits. This is especially attractive to local food businesses, where the flow of business if often seasonal.

Local food advocates in Michigan might encourage residents to shift part of their long-term savings into self-directed IRAs. There are many scenarios in which this could happen. If two percent of residents– one in twenty households -- shifted 5% of their long-term savings accordingly, all the finance needed would be available.