Evaluating the Economic Impacts of Local & Regional Food Systems

A TOOLKIT TO GUIDE COMMUNITY DISCUSSIONS, ASSESSMENTS AND CHOICES

East Lansing, MI
December 14, 2015
Introduction

- Welcome – Rich Pirog

- Thanks to our sponsor:
  MICHIGAN STATE UNIVERSITY | Center for Regional Food Systems

With funding from:

U.S. DEPARTMENT OF AGRICULTURE

W.K. KELLOGG FOUNDATION

The Economics of Local Markets USDA AMS Toolkit- 2015
MSU Center for Regional Food Systems (CRFS)

Mission: Develop regionally integrated, sustainable regional food systems

Work: Michigan Good Food Charter, food access and health, farm to institution and farm to school, healthy food financing, food hubs, food systems planning and food policy, organic production - marketing, beginning farmers, city-region food systems in a global context

Good Food = Affordable, Healthy, Fair, & Green for all Michiganders
Backstory: Why is the MSU Center for Regional Food Systems co-sponsoring this webinar with Dawn & Becca from Colorado State University?
**COLLECTIVE IMPACT & SHARED MEASUREMENT**

**MICHIGAN GOOD FOOD CHARTER**

- Collaborative project to build the case for collectively measuring statewide food systems change in Michigan

### Good Food Charter Goals

1. Institutions source 20% locally
2. Farmers will supply 20% of food purchases, fair wages
3. Generate new agri-food businesses
4. 80% of Michigan residents will have access to healthy food
5. School nutrition standards
6. Food and agricultural education pre-K through 12th grade
Priority areas – Shared Measurement

- **Institutional Procurement**
  - New survey tools
  - Secondary data template report
  - Pilot projects - 2016

- **Economic Impact**
  - Economic indicator training – Basic and advanced (October – November 2015)
  - Secondary data tools

- **Healthy Food Access**
  - New survey tools
  - Secondary data template report
  - Pilot projects - 2016
The Team – Dawn Thilmany, coordinator

- David Conner, University of Vermont
- Steve Deller, University of Wisconsin
- David Hughes, University of Tennessee
- Ken Meter, Megan Phillips Goldenberg, Crossroads Resource Center
- Alfonso Morales, University of Wisconsin
- Todd Schmit, Cornell University
- David Swenson, Iowa State University
- Allie Bauman, Rebecca Hill, and Becca Jablonski, Colorado State University
Justifying this Toolkit

• Broadly held sense that economic implications of new food system initiatives should be framed and measured in a more standardized (and rigorous) manner, but also responsive to community needs.

• USDA AMS:
  ○ New resources/initiatives (i.e., Farmers Market and Local Foods Promotion) in need of evaluation framework
  ○ Expanding role as technical service provider
Toolkit: Seven Modules

- Covers two stages of food system planning:
  1. Assessment
  2. Evaluation

- Modules (1-4): Guides the preliminary stages of an impact assessment - framing the system, relevant economic activities, and collecting and analyzing relevant primary and secondary data

- Modules (5-7): Overview of more technical set of practices, including using information collected in stage one for a more rigorous analysis

- This toolkit is meant to be used in its whole or in part, but does not necessarily need to be utilized from start to finish
  - However, later modules assume knowledge of and findings from prior modules
Module 1: Structuring the Assessment Process to Enhance Success

- Food System initiatives are diverse
  - Place based nature is key to success in meeting local needs
- Toolkit urges it is important to:
  - Assemble a diverse project team
  - Establish realistic timeline and roles
  - Scope the study appropriately – establish study parameters and priority issues

Timeline for Northern CO Food Assessment

<table>
<thead>
<tr>
<th>Organize Process</th>
<th>Winter 2010</th>
<th>Spring 2010</th>
<th>Summer 2010</th>
<th>Fall 2010</th>
<th>Winter 2010-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gather Data</td>
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<tr>
<td>County Meetings</td>
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<tr>
<td>Finish Data Collection</td>
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<td>Open Houses by Element</td>
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<tr>
<td>Organize/Analyze Information</td>
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<tr>
<td>Reach Conclusions</td>
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<tr>
<td>Present to Co. Commissioners</td>
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<tr>
<td>Share Results with Public</td>
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</tbody>
</table>
Modules 2 & 3: Primary & Secondary Data

- Provides list of secondary data sources (divided by supply chain)
  - Full and updated list available on website: http://www.localfoodeconomics.com/appendices/
- Discussion of when and how to supplement with primary data collection.
- Detailed information about:
  - Qualitative and quantitative research;
  - Surveying, interviewing, and sampling methods.
Module 4: Data Interpretation

- **Let the data speak:**
  - Test your assumptions/conventional wisdom;
  - Comparative analysis/benchmarking;
  - Linkages across system (i.e., economic, social)

- **Words of caution:**
  - Correlation vs. causality;
  - Every *difference* in measurement does not represent a *significant difference*

- **Simple spatial analysis techniques explained:**
  - Cluster mapping;
  - Location quotients
ANALYZING LINKAGES OF LOCAL FOODS TO LOCAL ECONOMIES

MODULE 5

The Economics of Local Markets

USDA AMS Toolkit- 2015
Direct Effect
Direct Effect
Direct Effect

Indirect Effects
Direct Effect

Indirect Effects
Direct Effect

Induced Effects

Indirect Effects

Total Value of Local Economic Impact = direct + indirect + induced
We are able to measure the extent of complex intra-regional linkages using input-output analysis to generate economic multipliers.

An economic multiplier is a single number that captures the economy-wide circulation of activity from an initial financial transaction:
- direct + indirect + induced effects
Clarifying Economic Terms

- **Growth** is a dynamic concept that looks at *change over a period of time*
  - Growth is synonymous with expansion; for example, more jobs, more people, more businesses, or more income.

- In contrast, **development** is related to *improvement relative to some starting condition*, or sustained progress toward a particular goal.
  - This could be movement toward a more sustainable use of resources, or enhancing the quality of life in the community.

- Growth is relatively easy to measure; development is a more nebulous and multi-faceted concept.
Clarifying Economic Terms

- **Impact** tends to be associated with a specific event or change in behavior and can be static or dynamic.

- Consequently, **impact assessment** is comparing and contrasting what a community looks like before and after a particular event or change in behavior.
  - Often referred to as a **shock**
Economic Impacts of Local Foods

- One way to frame the impact of local food growth is considering it **import substitution**.

- When locally produced foods are substituted for imported items, stronger regional linkages are forged:
  - If local foods production and consumption increase, there are economy-wide consequences.
  - Best practice measurement of these can help inform communities of the potential economic gains from local food system initiatives.
A Visual Representation

A Simple Multiplier Illustration

- Local Spending
- Leakage

<table>
<thead>
<tr>
<th>Export Sale</th>
<th>Initial Local Spending &amp; Leakage</th>
<th>Next Round</th>
<th>Initial Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.00</td>
<td></td>
<td></td>
<td>$1.00</td>
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<tr>
<td></td>
<td>$0.40</td>
<td>$0.16</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>$0.60</td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>

Full Impact: $1.66
Multipliers

- The value of the **multiplier** in this example is 1.66
  - Direct + the indirect + the induced effects
  - For every dollar of new local food sales revenue earned by the farmer, the total impact on the local economy is estimated to be $1.66
    - i.e., the initial $1 expenditure and an additional 66 cents based on the calculated economic multiplier effect

- The multiplier is NOT directly related to growth or development. It is aimed at assessing impact; the economy before and after the ‘shock’

The Economics of Local Markets
Reliable Local Foods Impact Estimates

- Input-output (I-O) models track the flow of transactions between local industries, sales by industries to households, and to other “final users” of goods or services (e.g., government).

- Most analysts use IMPLAN (IMpact Analysis for PLANning) for their I-O analysis because of its ease of operation.
Defining the Study Area

- Determining what constitutes local can have a decisive impact on the results
  - The broader the definition of local, the more inter-industry linkages exist
  - Less likely to emerge as a zero-sum game

- To isolate the effects of an impact, create as small a study area as possible while including the areas necessary to capture all of the important effects
Defining the Study Area

- Consider the availability of secondary data for your region, as described in Module 1 of the Toolkit
  - Secondary data available from IMPLAN by zip code, congressional district, county and state
  - IMPLAN’s functionality allows researchers to easily develop multiple county or state-based models

- Regional scientists advise using the concept of a functional economic area
  - Semi self-sufficient economic unit including the places where people live, work, and shop, and can sometimes be identified by physical or other characteristics
Bigger Study Area is not always Better

- It is tempting to assume a statewide impact
  - Unless the key aim of the study is to evaluate a state’s contribution or statewide industry magnitude
  - However, using a larger geographic region will inflate and exaggerate your impact results
  - Results will be less reflective of the actual economic activity occurring in your region

- A good rule of thumb is that a study territory should encompass the geography from which the majority of the assessment team members hail
  - Don’t forget to consider the residential location of the labor force as their spending patterns are important
Reasonable Size of Multipliers

- May be tempting to use the largest multiplier possible to build support for your position
- Researchers typically use multipliers less than 2.0
  - Multipliers for smaller rural areas close to 1.3 and for larger more urban areas closer to 1.9

- Two things that generally drive the size of the multiplier:
  1. The level of inter-industry linkages (imports or leakages)
  2. The size of the economy or sector being examined
Reasonable Size of Multipliers

The Economics of Local Markets
Challenges with I-O and IMPLAN

**Assumptions:**
- Constant of fixed relationship among industries
  - If local foods production in a region doubles, so too will its demand for regionally supplied inputs
  - “Supply always equals demand”
- Fixed technology
- Fixed prices
- No demand constraint—is there reason to believe there are new spending dollars in total?
A ‘good’ study

WHAT TO LOOK FOR WHEN REVIEWING LOCAL AND REGIONAL FOOD SYSTEM ECONOMIC IMPACT ASSESSMENTS

MODULES 6 AND 7
What does a ‘good’ study look like?

1. Good data
   - Model reflects the conditions in the field
   - Built from data that is likely used for comparables

2. Sound assumptions
Good Data

- Adapting your I-O Model:
  - Evidence that farmers and value-added businesses interact differently with the local economy than more commodity-oriented businesses
  - Evidence that these value-added businesses purchase a greater share of their inputs locally (by definition)
    - e.g., Food hubs, local food aggregation and distribution businesses
Model Reflects Reality

- Local food system producers have different expenditure patterns

Source: California Tomato Machinery

Red Fire Farm, Cherry Tomato Harvest.
Source: Emily Shannon, Formaggio Kitchen Cambridge
The Economics of Local Markets

USDA AMS Toolkit- 2015

US Benchmarks

Source: USDA ARMS 2013
US Benchmarks

Nonlocalfood*

- Purchased livestock
- Purchased feed
- Other variable expense
- Seeds and plants
- Fertilizer and Chemical
- Labor
- Fuel and oil
- Maintenance and repair
- Machine hire and custom work
- Utilities
- Other livestock related

Alllocalfood*

- Purchased livestock
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- Other variable expense
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- Machine hire and custom work
- Utilities
- Other livestock related

Source: USDA ARMS 2013
IMPLAN Baseline Info

- IMPLAN data comes primarily from national sources – e.g., BEA, Ag Census

- Each IMPLAN industrial sector represented by a single, initially-fixed expenditure pattern.
  - 14 agricultural sectors, ex: fruit farming
Good Data

- Normally need to augment available data by collecting information from the food system businesses
  - Goal of primary data collection is to come up with an average local food farm/business expenditure profile -- not an easy task
- Important to ensure that such surveys are as representative of the targeted local producer or processor population as possible
  - Surveys of convenience, like a select sub-set of program participants or advocates, likely will not be adequate
  - Document operational costs carefully or risk of economic distortions when data are run through input-output models
### Summary of Expenditures Per Dollar of Output for the Default Agricultural (Farm Products) Sector and the Food Hub Farm Sector

<table>
<thead>
<tr>
<th>Selected Industry Sector/Value Added Components</th>
<th>Farm Products (Default)</th>
<th>Food Hub Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture production a</td>
<td>$0.056</td>
<td>$0.159</td>
</tr>
<tr>
<td>Support activities for ag and forestry</td>
<td>$0.018</td>
<td>$0.079</td>
</tr>
<tr>
<td>Utilities</td>
<td>$0.015</td>
<td>$0.018</td>
</tr>
<tr>
<td>Construction</td>
<td>$0.005</td>
<td>$0.023</td>
</tr>
<tr>
<td>Manufactured food</td>
<td>$0.002</td>
<td>$0.010</td>
</tr>
<tr>
<td>Manufacturing (other)</td>
<td>$0.022</td>
<td>$0.027</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>$0.015</td>
<td>$0.016</td>
</tr>
<tr>
<td>Retail trade (total)</td>
<td>$0.001</td>
<td>$0.016</td>
</tr>
<tr>
<td>Transportation and warehousing</td>
<td>$0.012</td>
<td>$0.033</td>
</tr>
<tr>
<td>Finance and insurance</td>
<td>$0.035</td>
<td>$0.022</td>
</tr>
<tr>
<td>Real estate and rental (total)</td>
<td>$0.055</td>
<td>$0.014</td>
</tr>
<tr>
<td>Professional scientific and technical services</td>
<td>$0.006</td>
<td>$0.009</td>
</tr>
<tr>
<td>Automotive and machinery repair and maintenance</td>
<td>$0.001</td>
<td>$0.009</td>
</tr>
<tr>
<td>Other sector purchases</td>
<td>$0.009</td>
<td>$0.006</td>
</tr>
<tr>
<td>Total intermediate input purchases</td>
<td>$0.250</td>
<td>$0.441</td>
</tr>
<tr>
<td>Employee compensation</td>
<td>$0.117</td>
<td>$0.236</td>
</tr>
<tr>
<td>Proprietor income</td>
<td>$0.159</td>
<td>$0.053</td>
</tr>
<tr>
<td>Other property type income b</td>
<td>$0.124</td>
<td>$0.019</td>
</tr>
<tr>
<td>Tax on production and imports b</td>
<td>-$0.007</td>
<td>$0.056</td>
</tr>
<tr>
<td>Total payments to value added</td>
<td>$0.393</td>
<td>$0.364</td>
</tr>
<tr>
<td>Intermediate imports</td>
<td>$0.356</td>
<td>$0.195</td>
</tr>
</tbody>
</table>

Source: Schmit, Jablonski and Kay 2015

With data collection, don’t just need to know what the producer/business purchases, but also where!
Sound Assumptions

- Finite resources (e.g., land, consumers dollars, public dollars) so every decision involves a choice

- Incorporated into economic impact assessments by estimating the net rather than the gross impact of changes in a local/regional food system

- Can be on supply (production) or demand (consumer) side, or both
Examining Net vs. Gross Impacts

- **The no resource constraints** assumption on the supply side –
  - i.e., gross gains in local food production must be balanced against the shifts (referred to as **countervailing effects**)
  - Usually come in the form of a direct, acre-by-acre reallocation of existing uses of agricultural land

- **The no opportunity cost of spending** assumption on the demand side –
  - i.e., farmers directly marketing their crops constitute a positive local economic impact, but there may be negative impacts
  - due to opportunity cost of lost direct sales activity in other sectors of the economy (the wholesale and retail sectors)
Incorporating Countervailing Effects: Potential and Constraints to Local Foods Development in the Midwest

Source: Swenson 2011
Opportunity Costs to Other Sectors

- Requires information about the extent to which increased consumer purchases of locally-grown food:
  - Affects other types of food purchases
  - Changes market prices and/or supply chain characteristics, or
  - Impacts land use

- For instance, if a region’s food buying dollars are shifted as a result of a “Buy Local” promotional campaign, or investments in a local food initiative can be expected to displace some food distribution:
  - No secondary data to answer that question
  - No data on exactly how linkages vary across different markets
Case Study: Food Hubs

- Surveyed 305 of Regional Access’ customers
  - 49% purchased less from other sources due to purchases from RA
  - Average reduction >23%
- Opportunity Cost associated with $1 increase in final demand for food hub sector ~ $0.11
- Reduced Total Output Multiplier from 1.82 to 1.63 (>10%)

Source: Schmit, Jablonski and Kay 2015
Sound Assumptions
Competition for Vendors at Farmers Markets

Does creating new markets in areas with high vendor competition increase market access for vendors?

Source: Lohr and Diamond 2011
Concerns about Overestimation

- Since economic impact numbers will be smaller when opportunity costs are considered or included, it can be challenging from a political standpoint.
  - Larger numbers may help to ‘sell’ projects, but results are less defensible.
  - It is a valuable practice to:
    - Adopt more standardized approaches
    - Offer good examples of how opportunity cost adjustments can be incorporated, and
    - Learn from previous rigorous examples to support your modeling refinements
Become Involved

Website and listserv: localfoodeconomics.com
Thank you!