


Critical Analysis of Economic Impact Methodologies

By Ken Meter and Megan Phillips Goldenberg

A Selection from *Exploring Economic and Health Impacts of Local Food Procurement*

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CONSIDERATIONS FOR IMPACT ANALYSIS

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Brief Introduction on Economic Impact Analysis

Increased interest in local food systems has sparked increased investment, whether at the consumer level (price premiums at the local farmers' market), the regional level (development of a food hub), or the institutional level (farm-to-institution programs). This has fueled a recent rebirth of interest in economic impact studies covering food systems. While these studies vary greatly in their approach and methodology, the conclusions are almost always the same — investments in the local food system yield positive economic impacts. The magnitudes of these impacts are a topic of hot debate, as are the types of food systems investments that render the best return on investment. Results can vary widely depending on the quality and quantity of the data available, the assumptions made, the different scenarios modeled, and the validity of the approach taken (Crompton, 2006).

Due to the complexity and cost of prevailing economic impact analysis (EIA) models, a very real practical issue surfaces when considering the use of economic models in community foods contexts: Should resources be allocated to economic modeling, or to building the foundation of local food trade?

In general, EIA estimates several "ripple effects" that a given new revenue stream, investment, event, policy, or program may have on a given locale. Typically, these EIA studies use mathematical models to suggest what would happen if a new source of revenue created a change from current conditions. EIAs may also be used to pose future "what if" scenarios for a specific area.

These estimated impacts are quantified as new economic outputs, typically jobs and personal income. For example, an EIA of a proposed tax increase to support the local school system might predict a loss of jobs in the private sector, and a gain of jobs in the public sector. In the context of this project, a common use of EIA would be for policy makers who are interested in estimating the number of new jobs or new personal income (outputs) that would be gained if a certain amount of money were invested (inputs) in purchasing food from nearby farms.

The term "economic impacts" is often misused in common discourse. Often the term is misleadingly used to identify "spending" (an expense to the school, and revenue for the producer) rather than the "impact of spending"(outputs). For example, one might hear a school nutrition director describing the economic impact of a farm to school program in terms like this: "We made an impact of $200,000 in new food purchases." A more technical definition of "impacts" would focus on how this expenditure rippled through the local economy to create new jobs or personal income, as in: "Our investment of $200,000 to buy local foods created an additional $63,000 of income for local residents." In this example, the $200,000 initial input is considered the direct impact, whereas the $63,000 additional income is an indirect and/or induced impact, and the total impact is $263,000.

Economic Multipliers and Community Connectivity

Impact calculations are often posed as an economic "multiplier." The multiplier is a measure of how many times a dollar earned in a given geographic area cycles through that locale before it leaves. For example, if an EIA focuses on jobs, it might estimate the ratio of new jobs that will be created by an investment of a certain amount, compared to employment found under prevailing economic conditions. To use a more abstract way of thinking about this, a multiplier is the ratio of new outputs to new inputs.

At minimum, a multiplier must be 1.0. This would mean that each dollar of new revenue leaves the community immediately. Tribal reservations often have multipliers close to one since residents typically have so few choices for buying locally produced goods and services. If the multiplier were 2.0, this would mean that for each dollar of new revenue one additional dollar is spent at another local business — a total of two dollars. In the example above, if $200,000 of new spending created $63,000 of new local payroll income, one could say that the value of each dollar spent on local food purchases was "multiplied" 1.31 times ($263,000/$200,000) as it rippled through the community — after which that dollar was likely to flow outside the region.

A region of small farms and businesses that buy many of their essential goods and services from each other, and are closely connected socially, might enjoy multipliers as high as 2.6.[88] Some rural advocates claim that a dollar earned by a farm cycles as many as 7 times through the overall economy. This may have once been true (definitive studies of this are lacking), but if this were true, it has not been since 1950, when increased use of mechanization and purchased inputs created dependence on external suppliers, reducing local multipliers.

In a very real way, a multiplier is a measure of the local economic context and its level of connectivity, more than a measure of the change in income itself. The more local firms and residents are interconnected, and trading goods and services with each other, the longer a dollar is likely to cycle through the region, and the higher the multiplier. The same business (or investment) placed in two different settings may yield quite different multipliers.

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88 Interview with economics professor Larry Swain, former community development specialist for the University of Wisconsin Extension Service and director of the Survey Research Center at UW-River Falls, February 12, 2001. See Swain, L.B. (1999). "A Study of the Economic Contribution of Small Farms to Communities – Completed 1996 to 1999." Unpublished manuscript; and Swain, L. B., & Kabes, D. (1998). "1996 Community Supported Agriculture Report." Unpublished manuscript.

Strictly speaking, a multiplier only applies to a specific firm doing business in a specific context, but its use has been expanded (with some justification) to include broader uses. So, many economists talk of measuring the multiplier of an investment in an entire economic sector such as local foods or construction.

Yet the emphasis on measuring economic multipliers is often misplaced. If increasing the local multiplier is the goal, then the path toward achieving that goal is to nurture the growth of dozens of independent, yet interconnected small businesses owned by local residents, and to foster local purchasing of locally produced goods and services. This path may run counter to hopes that many food leaders have of "going to scale." In general, when firms are larger, multipliers (positive local economic impacts) will decrease.

Economic approaches that measure economic progress strictly from the perspective of the firm, or of the national economy, often overlook this reality. Attempting to create greater efficiencies – when viewed strictly from these perspectives – may indeed generate considerable surplus value that can be diverted to what is often considered a "higher use." Yet from the perspective of those communities, or their business networks, that have contributed to the creation of this surplus value without gaining financial reward, such a shift in resources amounts to an extraction of potential wealth.

Thus, agricultural regions have adopted labor-saving technology in a devoted effort to promote national efficiencies – when what was needed was employment; rural youth have become "exports" to metropolitan areas. Moreover, while farmers have doubled total-factor productivity since 1969, net cash income from farming nationally has remained constant at best, when inflation is taken into account.[89]

Moreover, declining multipliers also represent a diminishing of the potential to create local wealth, since resources are so efficiently moved to what have been considered "higher" uses. This not only has consequences for the locale, but also for the national economy. When local economic engines are weakened, labor availability and productive skills decline, and stored capital may be diverted to maintaining an income flow, rather than toward new productive capacity. Tax contributions decline relative to financial centers. This creates a downward spiral in which resources increasingly flow to metropolitan areas, while abandoning inner-city and rural communities.

In recent years, political resentment toward financial centers has erupted in regions that felt undervalued compared to metro centers, leading to legislative stasis.

Our approach, then, takes into account multiple perspectives when viewing the national economy, but errs on the side of adopting local points of view, since these perspectives have been so undervalued in recent economic discourse.

[89] Source: USDA Economic Research Service, Farm Productivity series. Table 1. Indices of farm output, input, and total factor productivity for the United States, 1948-2009 [website unavailable at this writing]. USDA Economic Research Service, Farm Balance Sheet series. Part 1: Farm income and balance sheet indicators, 1929 - 2012F, expressed in constant (2005 = 100) dollars.
http://www.ers.usda.gov/data/farmincome/finfidmu.htm

Summary of Common Themes and Considerations

As mentioned above, all studies reviewed project positive economic impacts of varying degrees from investments in the local food system. Where the practitioners pause for reflection, they converge on several ideas. First and foremost, it is widely accepted that any one model without modification is inadequate for modeling local, small-scale agriculture and the associated food system. Secondly, it is recognized that the quality of local data sets is critical to the enterprise, and that many existing data sets are inadequate for representing small and rapidly changing food system initiatives. Third, modeling software poses difficult questions of interpretation since it returns precise values for calculations that are limited by data sets that fail to accurately reflect local conditions, or to account for emerging new industries. Fourth, scenario planning, while not as rigorous in intent, may nevertheless prove valuable in helping understand critical paths and points of potential strategic importance.

The first three concerns listed above are closely related. As one example, consider a rural county in the Midwest that grows and sells $125 million of cash grains in a given year. Data compiled to depict the agricultural industry in such a county for a typical software package would reflect the intensive fertilizer applications, professional advice, 32-row combines, and unit-train grain elevators that were required to grow these grains and convey them to market.

Asking the question in such a case, "What is the economic impact of local food purchases by a school district?" is fraught with difficulty. For example, a local aggregator may bring 100 caseloads of organic cucumbers to the school building in a refrigerated truck. Very little of the infrastructure listed above is used by the farmers who supply this aggregator. Since the truck would not convey grain, its use is essentially invisible to the software model. If the modeler asks, "What is the impact on the farm economy when the first $50,000 of cucumbers is sold to local schools?" a number could be generated from prevailing software data, but it is meaningless, since increased purchases of cucumbers do not result in either increased or decreased income to the farm sectors that are actually represented in the modeling software. Moreover, any emergent new industry is too small and too new to be meaningfully modeled, so it would not be reflected in the impact analysis since the modeling software would not have picked up its economic activity (the third concern listed above).

Looking at the first concern listed above, if one's software model assumes that producers can expand to meet new demand without limit, the limited ability of local grain-oriented farms to shift to producing cucumbers (or another produce item) given their farming expertise, goals as farmers, and available labor and technology (including harvesting equipment, refrigerated trucks, storage areas, and more) would not be captured. A model that assumed prices were constant would not pick up the fact that the school might have paid 5% more (or 5% less) to purchase this product.

Models could be run using all three of the main approaches outlined above, yet each is likely to give a different answer – and given prevailing data sets, none of the answers is likely to accurately reflect local conditions.

The difficulties are compounded, when, as is common, modeling software uses national data (whether for production of grain or production of specialty produce) and divides that by population or farm sales to estimate local food trade in a given county. This is one basis for the second concern listed above. Such data may be useful when projecting the impacts of, for example, siting a new grain elevator in this county. Even if not totally accurate it may yield a general sense of potential impacts. Yet it holds little relevance to the question of produce farming, especially in a county where such a "sector" has not operated in recent years. Even an astute modeler who adapts the data sets for local use may be called upon to input data from, say, California or Michigan, reflecting a mechanized cucumber industry that is not being introduced into this fictitious Midwestern county. Income data covering small-scale organic production may simply not be available.

Multiple Ways to Model an Economy

If EIAs intend to measure the ratio of new outputs to new inputs, this is tricky, because very little of the data that would be required to make such an estimation is public. Most business records are held confidentially. Moreover, the economy of even a small locale can be so complicated that making any effective measurement of outputs and inputs would prove physically impossible.

So, experts have come up with several ways of simplifying calculations using economic models. One common approach is to develop an input-output (I-O) model. The basis of I-O modeling is understanding that sectors of an economy are linked — an output from one sector may be an input in another sector (for example, a farm may produce carrots that are washed, diced, frozen, and packaged in a nearby firm, and these may in turn be purchased by a school lunch program). Therefore, any change in an economy will have both direct (the farm sells carrots) and indirect (new jobs are created at the food processor) effects. Furthermore, new jobs at the processing facility will lead to increases in household income, which in turn may lead to additional jobs in a service sector (medical personnel, for example).

No economy can be fully modeled. Simplifying assumptions must be made to make any calculations at all. For example, I-O models assume perfect supply and demand.[90] That is to say, for example, that it is assumed that when demand for fresh fruits and vegetables increases, supply increases to meet this demand without prices changing. Our case-example research shows that this is often a faulty assumption. Furthermore, I-O models assume that unlimited supplies of inputs (e.g., raw materials, fuel, or

[90] The technical term for this assumption is "market clearing conditions."

subcomponents) are available. Real-life constraints on input supplies mean that actual impacts may be smaller than standard I-O projects.

IMPLAN[91], an I-O model developed at the University of Minnesota and commercially provided by MIG, Inc., is by far the most commonly used model for EIA. This is because it is relatively affordable and relatively straightforward to use. It is the model most likely to be taught in academic settings. Moreover, advanced users are able to alter the underlying structure of the modeled economy, the data, and the manner in which impacts are calculated (Deller, Hoyt, Hueth, & Sundaram-Stukel, 2009). Accordingly, many consulting firms have adapted IMPLAN to create proprietary models.

Other common methodologies are more complex, and involve simulating the workings of an economy that is changing over time (economic simulation models, or ESMs). These models include computable general equilibrium (CGE) models and others.

ESMs include most aspects of linear I-O models and add even more features. They try to account for complexity, rather than being limited to simpler (linear) relationships. They can be used to estimate changes over a longer period of time, and allow for more dynamic aspects of an economy to also change (such as prices). They are necessarily more complicated, requiring more time and resources to build, and sophisticated computer software programs to execute. As such, these are not as readily available or financially accessible as stand-alone I-O models. Regional Economic Modeling, Inc. (REMI) does provide a commercial model and data for United States counties.

CGE models, on the other hand, allow both price and quantity of goods and services to change within the model. They incorporate simplifying assumptions of their own. For instance, they assume that firms will do anything needed to maximize profits, and that consumers will be "economically rational:" they will do whatever is needed to gain the maximum possible use (The State of Queensland, 2012).

Overall, I-O models are not only easier to use and construct, but they are also more likely to provide larger impact estimates than CGE or econometric models. This means they are preferred by practitioners and politicians alike.

As a rebuttal to these I-O models, an econometric model for evaluating the impacts of community-focused agriculture on per capita income and total farm sales was recently put forth. Although this econometric model also falls short of accounting for inherent differences between small-scale specialty crop production for local markets and large-scale commodity production for export markets, it does highlight the potential for I-O models to over calculate impacts (Brown et. al., 2014). Interestingly, the proposed model is considered valid nationally, but when applied regionally, the model only holds up in some regions. This could reflect the structural differences in agriculture and mixes of farm type in various regions, thus validating the notion that different types of farm

[91] The acronym represents "Impact Analysis for Planning."

enterprises affect the local economy differently. Over all, this application of econometric modeling is too preliminary for drawing widespread conclusions.

One potential alternative – the "Local Multiplier 3" methodology (LM3) devised by the New Economics Foundation in England – is a simpler version of an input/output model, geared for use in a civic setting, rather than strictly by professional economists. Rather than drawing upon secondary data sources that are already internalized by a software model, LM3 calls for compiling local data sets that trace financial flows through the local networks through which institutions actually trade.

The number "3" in the name LM3 stands for three cycles of economic impact: one cycle of direct impact, and two cycles of indirect impacts. (1) The *first* cycle of economic impact would be the amount of "local" food purchased by the institution of interest within the geographic region they define as "local." This initial spending is the *direct* impact of local food purchasing. (2) The *second* cycle would be local purchases made by those firms that supplied the institutions with local foods (for example, labor, machinery, and supplies that were locally sourced). (3) The *third* cycle would be local spending by the employees of those supplier firms, as they bought life essentials that were sourced locally. These final two cycles include both indirect and induced impacts. The overall economic multiplier is a calculated combination of all three cycles of economic activity.

LM3 developers propose that these three cycles account for over 90% of the economic impact effects approximated by traditional economic impact software. Since the LM3 model draws upon primary data that could in theory be generated within the community, it seemed like an interesting alternative to proprietary software that relies on secondary data.

Unfortunately, since the impacts of a policy change, program, or event can never be fully quantified, there is no way of assessing the accuracy of these models in the first place, let alone their modifications. They have become the industry standard and are based on prevailing economic theory; developers do ground test the results in real-life settings. Yet at best they are approximations.

The Measure of an Economy – Data Collection

To simplify calculations, I-O models make simplifying assumptions[92] and use relatively straightforward equations,[93] however, the data required to feed these systems of equations is enormous. Many countries use I-O models to estimate gross domestic product (GDP). In the United States, data is available for nearly any county, metro area,

[92] For example, that prices for goods and services are constant during the analysis.
[93] E.g., using linear algebra to calculate a matrix of modeled economic relationships. This may sound complicated, but these equations assume that most relationships are stable, and assume that interrelationships are straightforward. This is of course not true in real life, but makes the process of making calculations far easier.

state, or municipality through MIG, Inc. (IMPLAN) and the US Bureau of Economic Analysis (RIMS-II).[94,95]

These commercial models largely rely on data that is available through national sources, which may or may not be collected at a local level. Thus, a "local" data set showing the agricultural economy may be a calculated value based on the county's share of national commodity sales. In a highly standardized economy, this can be a legitimate assumption (buying grain in Iowa may be very similar to buying grain in New York State), but this assumption frequently breaks down when small amounts of local food trade are being modeled.

In addition, these commodity flows are inherently different than local produce flows. In modeling the agricultural input sector of a Midwestern county, the inputs that are being modeled constitute the large-scale machinery, pesticides, and mechanics services that make the industrial economy possible; few data sets express the actual farm inputs that a small-scale vegetable producer might require (beneficial insects, manure, compost, etc.).

For example, some state-level data could show that most producers mostly sell commodities wholesale, while local knowledge of a given county or city would suggest that many fruit and vegetable growers sell retail quantities directly to residents.

Because of this, Gunter and Thilmany (2012) collected primary data from local producers and school food directors to determine the economic potential of a farm to school program in one rural community. When examining a hyper-local and unique issue such as food systems, the agriculture data feeding the model must be locally derived. Yet this can also make it difficult to make valid comparisons across sites.

In addition to ensuring that the underlying data is relevant, local food systems data must be handled separately from aggregated sector data. This typically takes the form of constructing new economic sectors within the model. While IMPLAN allows accomplished practitioners to do this quite readily, inserting accurate data can still be challenging. The methodology involves making the use of an industry sector that is inactive according to local data sets (for example, in northern states, the "cotton" production sector is an array of zeros in county data sets, but is still linked to agricultural input and commodity sales sectors through the EIA model itself). Scholars can make use of such "empty" sectors, inserting data that express the economic linkage of, say, the local vegetable sector. Technically, this creates a small economic model that estimates how much local value is added when a hundredweight of produce is grown and sold. This is called "modifying the production function."

For example, both Gunter (2012) and Hayes (2010) customized several unused agricultural sectors within an IMPLAN model (e.g. cotton) to represent what would

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[94] The acronym represents "regional input-output modeling system."

[95] At this writing, BEA has announced that it is reducing public access to its RIMS data

happen if fruit and vegetable producers sold produce directly to schools. Hayes modified the technical coefficients in the production function of the new sectors to better match the increased transportation and processing needs of farmers selling to a school district (2010). While this modification is valuable given that previous studies suggest that inaccurate production functions are one of IMPLAN's weakest links, it is not always done (Lazarus, Platas, & Morse, 2002). Swenson (2006) notes the importance of accurate production functions, however he does not alter those in this particular model due to a lack of cost-of-production data. His 2007 study relied upon production data from local farms collected by Meter and Enshayan (2008), but a formal paper covering this research is not available; these findings were reported only in a PowerPoint presentation (Swenson, 2007).

A Signal in the Noise – Considerations for Interpreting the Value of Results

All models and estimations are based on assumptions. To properly interpret a model's projections, it is important to understand and evaluate the accuracy of these assumptions every step of the way. The test of a good model is often not its accuracy but its utility. When a report does not state its assumptions upfront with justification based in research, it loses validity and damages the reputation of practice. In his 2006 paper, Crompton discusses how the practice of analyzing tourism events has lost its integrity since assumptions are not stated up front or based on reality. Often the projected impacts are not realized. He further wonders if tourism events themselves have any credibility in the eyes of community leaders after a decade of these questionable practices.

While not stating assumptions up front may threaten the credibility of a report and its findings, explicitly outlining research assumptions may invite criticism. One example of this is a study by private consulting firm, Civic Economics (2008), that attempts to quantify the impacts of shopping at locally owned businesses versus big box stores. The report states an assumption that locally-owned businesses' rental payments stay in the local economy. While this may actually be true in some cases, one example indicates the dilemma this argument poses: many downtown businesses rent their storefront from an external investor; that investor's loan is typically held by a larger bank owned outside the community, so interest payments from this loan, though paid locally, may not be reinvested locally, nor add any value to local economic exchange. Similarly, Civic Economics has also claimed that any local expenditure be counted as adding local value even if the purchased good or service was produced elsewhere. Thus, a purchase of a book from a local store could be counted as a "local" purchase, even if it were printed in Singapore for a New York publisher and distributed from a California wholesaler.

Conversely, a justified assumption may garner respect. One criticism of EIA of agriculture and food systems has been that projected numbers of jobs created are inflated by several software packages. Jobs or livelihoods created directly by agriculture tend to be low-wage, seasonal positions, filled by underpaid young entrepreneurs, migrant workers, or even Amish families, so to say that a certain number of jobs were created in agriculture, without estimating actual income earned, does not do the goal of job creation justice. For example, one recent evaluation of Connecticut's agriculture industry was able to enhance its own credibility by clearly stating the assumptions it made, and by avoiding strong claims. This study used three different models (IMPLAN, RIMS II, and REMI) to assess economic impacts, and compared the results each model generated. Researchers clearly stated their assumption that the REMI model returned job creation numbers that were likely to be lower than the other models, since REMI allows for the possibility that workers might transfer to other industries, or migrate to other locations. Since the researchers also omitted jobs created by agriculture, and the value added by food processing industries in the region, their study added that overall job estimates were conservative, and likely to fall below actual levels (Lopez, Joglekar, Zhu, Gunther, & Carstensen, 2010).

The fact that locally produced food items can often be substituted by easily available produce (grapes may come from the farm next door, California, or Chile, or may be replaced by eating bananas from Costa Rica). This represents a critical obstacle to effective modeling, especially in I-O models where supply is assumed to be equal to demand and prices constant. A similar issue involves price differentials: if local farmers charge a premium for their products, consumers are free to turn to grocery stores for cheaper alternatives. This is a situation in which a CGE model is much better for modeling a food system since it accommodates dynamic forces such as pricing. Very few studies discuss the importance of price in their evaluation of food systems impacts, however some studies account for it directly. Tuck, Haynes, King, & Resch (2010) specifically address the issue of prices in their modeling of several farm to school scenarios, in which they adjust the model by raising tax rates as one way to account for increased food prices due to buying locally.

Perhaps the most significant limitation of EIA models, however, with respect to community-based foods work, is that the relatively small changes currently being made by emerging businesses and initiatives do not show up as highly significant in existing data sets, which convey the nature of the prevailing industrial commodity economy, not localized food trade. Advanced practitioners can devise workarounds that allow models to be used with considerable integrity, but they still fall short of serving as accurate portrayals of the workings of local economies. For example, CGE models have traditionally been constructed for states or countries, though economic researchers, Cutler and Davies, created one for Fort Collins, Colorado. In order to model shifts in consumer demand for local products, Phillips, Thilmany-McFadden, & Cutler (2010) collected evaluation data for a regional purchasing campaign. Using Cutler's data, they found that while the estimated financial impact was significant for many reasons, it was infinitesimal as a percentage of the gross city product. Even a city model was not sensitive enough to evaluate small investments in the economy.

A more elegant use of a modeled economy involved comparing two hypothetical situations (for example, a business that buys locally with a similar business that does not) where much of the modeling error is at least constant across both examples(Swenson, 2007). In such a case, *relative* multiplier estimates may be more meaningful than *absolute* values.

When models do not accurately reflect the reality local practitioners face, this leads to heightened concern (once again from the perspective of local firms or community members) that the money spent modeling might be better spent in actually building the local food system until its size justifies specific modeling.

Scenario Planning and Looking into the Future

The fourth concern listed above was the potential for scenario planning. Economic impact models may also be used to construct scenarios for future development. This is a realm in which a CGE model is more appropriate than an I-O model, since a thoughtfully designed CGE model will account for changing constraints on supplies and resources, such as land.

Yet there is a limit to the efficacy of existing models for predicting larger scale scenario shifts. The most critical limitation for the community-based foods discussion is that existing data sets assume relatively small shifts in economic activity; while to many food system practitioners, the opportunity represented by community-based food systems is to create new and dramatically different types and patterns of infrastructure. Models intended to create a potentially very different future can hardly be based primarily upon prevailing industry averages, especially given the large-scale nature of broadline distribution, and the relatively small-scale enterprises that community practitioners have so far built.

For example, one study used IMPLAN to model a 20% increase in consumer demand for locally grown foods. This resulted in large estimated impact calculations (Shuman, 2007), which have been highlighted in various media accounts. Yet this projection was not sensitive enough to account for the changes in distribution channels, farm inputs, or production practices that would be required to realize such a shift. It could not address whether there was sufficient land to meet such expanded consumer demand.

Conversely, Tuck and Nelson (2009) modeled a 5% substitution of imported commodities with locally produced commodities. In preparation for this study, the researchers evaluated which commodities were already being locally produced and whether or not they could be produced in enough quantity to support the modeled shift. Yet they were still limited by data sets that expressed economic impacts in terms of prevailing economic infrastructure, not the changes that would be realized if numerous local firms were formed to meet this shift in demand.

It is important to realize that sustainable economic and food systems development is long-term work. No model will accurately predict future impacts, and that is even more true in this current, changing economy. It is unwise to assume that the models and data of the past will predict the future given the recent economic crisis, particularly in agriculture, where the current Ag Census data was collected in 2007. One should assume that long held notions about economic development may not hold up in the current or future economy.

Considerations for Local Food System Assessments

Local Matters

The geographic boundary of the region of interest and evaluation must also be defined carefully. In some cases, this will coincide with municipal or state boundaries, but in all likelihood will be strongly shaped by freeway, rail, or water access, or even watershed boundaries. Existing EIA data sets may have limited applicability in this context. Typical data sets, defined by municipal boundaries, may not accurately reflect choices faced by community food system practitioners. As fossil fuel resources become more scarce, natural boundaries, alternate means of travel, and non-municipal factors are likely to weigh more heavily. For example, in the case of Colorado, producers on the west side of the state find it easier to sell to wholesalers and processes in Utah than to truck product across the Rocky Mountains into Denver. Michigan producers may have closer access to Chicago markets due to freeway access and historical purchasing loyalties than do farmers in central Illinois. Water transportation may become increasingly important as energy becomes more expensive.

If EIA models are used, it is typically critical to refine the model using data that is sensitive to local conditions, and evolving approaches to farming. This may include a wealth of factors including locally generated inputs, increased manual labor, seasonal variations in input costs, labor, and prices, smaller-scale technology, competing distribution channels, alternate transportation costs, smaller-scale processing costs, or recycling of wastes. In addition, direct-to-consumer market transactions inherently take place outside of conventional data collection mechanisms. Local data is difficult to gather due to limited recordkeeping, confidentiality concerns, and cost considerations.

The greatest gains in economic impacts are realized through local purchasing of intermediate inputs such as feed, seeds, and equipment. These are often the most difficult purchases to change due to the fact that feed, seed, and equipment sources are rarely local. Instead, most of these purchases are made nationally, regionally, or over the internet. The more that community-based food systems take root, the more likely that intermediate input suppliers will locate in a given community.

The Value of Community Connectivity

Even if complete data could be compiled, no software program can accurately model the complete workings of a regional economy. Often the test of an economic model is its educational value rather than the actual numbers it generates. As is common in community-based research, it is the *process* of assessing that has the greatest impact on the community due to the creation and enhancement of partnerships and networks.

The driving force in community-based food systems is relational trading, that is, commerce based on mutual loyalties (community supported agriculture models that reduce risk, slow money investments that change cost patterns, the strong desire among farmers and consumers to connect with each other, the possibility of building differentiation and branding based upon personal, regional, mode of production (e.g., fair trade, organic, or sustainable), cooperative ownership, or other loyalties). Such "sticky" transactions are not accounted for by conventional economic modeling, which assume consumers are isolated and determined to increase individual utility.

The economic impacts of locally owned businesses increase as they do business with each other. This suggests that local economic development is correlated with community development and social connectivity (social capital) yet little research is available to document this possibility. Instead, the two areas are usually studied in isolation. The next section examines social capital and networks as an attempt to bring these two subjects together.

Conclusions

The limitations and costs of performing comprehensive economic modeling, and the lack of transparency inherent in software-generated calculations, suggest that alternative approaches that are more easy to measure, comprehend, and communicate will be highly valuable to the economic impact discussion.

This is especially true since in these early stages of development, any dollar allocated to performing economic impact measurements may be a dollar that could have been equally well spent either launching local foods initiatives, or establishing economic strategies that actively create higher economic multipliers.

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