JOURNAL BRIEF: Can Local Food Production Meet Household Demand? A Look at 377 US Metros

Sustainable Healthy Cities Journal Brief - 2018, No. 8 - Local Food Capacity 377 Metros

This brief is adapted from the following peer-reviewed journal article: Nixon, P. & Ramaswami, A. (2018). Assessing Current Local Capacity for Agrifood Production to meet Household Demand: Analyzing Select Food Commodities across 377 US Metropolitan Areas. *Environmental Science & Technology*. DOI: 10.1021/acs.est.7b06462

Study Intent and Research Question

What food is already being produced in and around cities in the United States? How does current food production in a given metropolitan area compare to household demand for key food products in that same metropolitan area? These are important starting point questions to scientifically evaluate whether increased local food production in a given city is a relevant sustainability action that should be prioritized. This study answers the above noted questions for 377 metropolitan areas in the US. The study introduces a standard methodology for quantifying the extent of current local food production and household demand for specific food products (fruits, vegetables, dairy, and eggs). The results can inform better design of local food policy initiatives as well as future sustainable urban food systems at large.

Key Background Information

Food systems are critical to the wellbeing of people and the planet. In the US, agriculture consumes one third of all withdrawn water, while the US food system as a whole uses 15.7% of national energy consumption. Health risks from poor diet are estimated to contribute to over 500,000 annual premature deaths in USA.

More than 170 cities have signed on to the Milan Urban Food Pact, including 12 US cities, which includes (among other actions) a focus on more local food production in urban and peri-urban areas.

The environmental and sustainability benefits of local food production are varied. Estimated GHG benefits of reducing freight transport are relatively small (~10%), and food production in water-stressed cities can increase local water stress.

On the other hand, urban agriculture may offer benefits:

- Improve local access to fresh food (Hagey et al., 2012)
- Improve subjective wellbeing (Palmer, 2018)
- Enhance economic development of local food industries (City and County of Denver, 2017).

Evaluating the potential benefits of local food production requires, first of all, knowledge of current local food production compared against local household food demand.

US federal legislation defines local as grown within 400 miles of the point of consumption or within the same state. Consumers generally consider local to be defined as food grown within 100 miles (Feldmann and Hamm, 2015). This study considers "local" production as being produced in the same metropolitan statistical area (MSA).

Demand figures in this study represent direct *plus* embodied demand, including direct food items (whole eggs, oranges) *and* food utilized as ingredients in processed food (eggs in bread, oranges in orange juice, etc.).

Key Findings

In looking at both direct *and* embodied food demand:

- 20% of all MSAs have capacity to be fully self-sufficient in the production of dairy and eggs.
- 12% of all MSAs demonstrated capacity to be fully self-sufficient in the production of fruits.
- 16% of MSAs demonstrated capacity to be fully self-sufficient in the production of vegetables

When changing the criteria for "local" to food produced within a 100-mile radius, and focusing on fresh foods only (direct demand), the proportion of already self-sufficient metros increases significantly with 69% of metros being self-sufficient for fluid milk, 85% for unprocessed eggs, 34% for fresh apples, and 81% for fresh tomatoes.

Among MSAs that do not have capacity for self-sufficiency for direct+embodied eggs and fruit, most have capacity to meet about 5% of local household demand.

MSAs generally had greater capacity to meet local demand for direct+embodied dairy and vegetable demand , with a median capacity to meet 18% of dairy demand and 23% of vegetable demand.

MSA population density has no correlation to current local capacity to meet local demand, indicating that land availability per se is not a limiting factor.

MSA's with populations <5 million vary widely in self-sufficiency, spanning net-exporters to net importers. Even MSAs with populations larger than 5 million are exhibiting noteworthy current local capacity to meet ~10% of demand.

Policy and Practice Implications

Current local capacity assessments quantify the degree to which current local production *could* meet local demand, not whether it actually does. Whether food produced locally is consumed locally is a function of supply chains.

Cities should think carefully about what specific purposes increasing local urban agriculture can serve. If a city understands the level of food production that is already happening locally and how that aligns with local demand for specific food products, it is in a better position to start designing smart and sustainable food policies.

Findings indicate significant local capacity already exists in many MSAs, but local production may presently be exported rather than dedicated to meeting local demand. Connecting existing local production to local demand requires conversations about supply chains with food industry stakeholders, particularly to address local food deserts.

More urban agriculture per se may not be the answer if the concern is meeting local household demand, as this study shows that production is often not the constraint. However, urban agriculture may serve other goals.

Food Systems

Co-benefits & Tradeoffs

Policy and Governance

Further Reading and References

-City and County of Denver. (2016). *Denver Food Vision*.

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-Hagey, A.; Rice, S.; Flournoy, R. (2012). *Growing Urban Agriculture: Equitable Strategies and Policies for Improving Access to Healthy Food and Revitalizing Communities*. Policy Link.

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-Palmer, L. (2018). Urban agriculture growth in US cities. *Nature Sustainability.* 1(1), 5–7.

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About the Sustainable Healthy Cities Network

The Sustainable Healthy Cities Network is a U.S. National Science Foundation supported sustainability research network focused on the scientific advancement of integrated urban infrastructure solutions for environmentally sustainable, healthy, and livable cities. We are a network of scientists, industry leaders, and policy partners, committed to building better cities through innovations in infrastructure design, technology and policy. Our network connects across nine research universities, major metropolitan cities in the U.S. and India, as well as infrastructure firms and policy groups to bridge research and education with concrete action in cities.