

What can we do with foodshed analysis?

Foodshed analysis helps cities to understand how much land they need to feed themselves, and where food comes from.

There are three main types of foodshed analysis, but it is difficult to compare results due to methodological differences.

In the future, they should rely on better data and seek to incorporate analysis of other urban resource flows.



Since the late 1970s, foodshed analysis has been used to estimate and examine links between rural food production and urban consumption. A recent paper published in *Environmental Research Letters* reviews existing research and provides recommendations to improve methodologies and better integrate such studies in urban food policies.

Emma Burnett
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Urban Food Futures would like to thank [Kerstin Schreiber](#) for her inputs and comments

Why do we need foodshed analysis?

Urban areas are net consumers, requiring much more recourse than they produce, and foodshed analysis (like watershed analysis) can help researchers and policymakers to **understand how much land is needed to support an area, what is required, and where goods come from**. As a resilience-building exercise, it can increase clarity of food-related vulnerabilities and dependencies, and what can be done to ensure a constant food supply and good urban-rural links.

However, studies of foodsheds have used a range of different scales and methodologies over the years. While each type of study has benefits, **this methodological variation and difference in aims and assumptions makes results comparisons between studies and across different locations difficult**, as is extrapolation of results.

Main foodshed study types

As part of her doctoral research at the Department of Geography of McGill University, Kerstin Schreiber and her team examined 42 foodshed studies in depth, 19 of which focused specifically on cities, 23 of which examined regions or states.

The three types of studies were compared using 10 criteria which examined their aims and methodological approaches, and highlighted commonalities, differences, inferences, and results.

Source:
[Kerstin Schreiber et al 2021, « Quantifying the foodshed: a systematic review of urban food flow and local food self-sufficiency research », *Environ. Res. Lett.* 16 023003](#)

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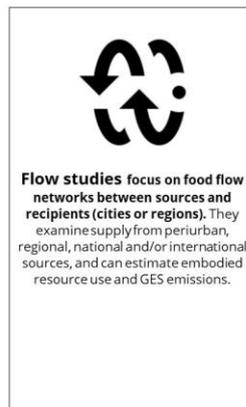
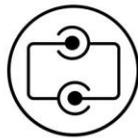
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Researchers identified three main foodshed study types: local food self-sufficiency capacity studies, food flow studies, and hybrid studies.

- **Capacity studies estimate local food self-sufficiency potential** using calculation approaches like self-sufficiency thresholds, inverse self-sufficiency thresholds, and foodshed area. The first two compare consumption and production to calculate how much food demand could be fulfilled by local production. The latter calculates the area of land (usually a radius around the selected area) that would be required to meet food needs. These approaches can be combined.
- **Flow studies focus on food flow networks between sources and recipients (cities or regions).** They examine supply from peri-urban, regional, national and/or international sources, and can estimate embodied resource use and GES emissions.
- **Hybrid studies** combine both capacity and flow approaches, and examine a city or region's embeddedness in both national and international food supply chains. They can also be used to understand the implications of trade on a region, which is particularly relevant to high net exporters, who may have a high potential for local food self-sufficiency but low realisation due to outward facing trade.

MAIN FOODSHED STUDY TYPES



Icons: Capacity, By [Adrian Cozuet](#); Flow, By [Gregor Cieslak](#); Hybrid connections, By [SRTS](#)

Scarce, unreliable, and fragmented data

The paper highlighted challenges associated with foodshed studies. The first relates to scarce, unreliable, and fragmented data. Usefulness of capacity, flow, and hybrid studies has been limited due to a lack of data on crop yields, soil properties, seasonality, and socio-economic and cultural preferences. **More primary data needs to be collected and integrated**, especially in data poor regions.

Additionally, **tools such as sensitivity analysis could be used to understand the limits or likely errors of a study, but are rarely applied.**

Improving foodshed analysis contribution to urban food policy

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To provide researchers, policymakers and planners with practicable information, Schreiber and her team recommend some research priorities, which would improve both modelling and policy relevance.

- **Understanding physical and social barriers.** Studies (especially capacity studies) often lack detail on infrastructure of a city or region; on economic incentives of a city or region to engage in local food production or sourcing; on the variety of possible distribution systems; or social preference of both farmers and consumers. They would benefit from combining analysis on city or region size and physical and social capacity.
- **Understanding relationships between food flows, urban material flows, and embodied resources.** A more complex and robust understanding of an area's foodshed could be explored by combining foodshed analysis with circular economy and urban metabolism research. This would account for waste streams, nutrient flows, origins of input materials, and the possibility for integrated systems.

Though many foodshed analyses would benefit from more development in certain areas, they can nonetheless help illuminate the opportunities and limitations of local food systems. They provide an interdisciplinary tool that can be used to explore and highlight different elements of the food system for a city or region, can utilise tools from different fields of practice (e.g. SWOT analysis), including impacts on and embeddedness in economic, ecological, and physical systems.

With improvements to some of the methodologies and analytics, support provided by both governments and the private sector, and accounting for local contexts, foodshed studies have potential to provide useful bio-physical, climatic, infrastructure, legislative, and socio-economic information to planners and policy-makers.

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