

# Is self-sufficiency the ideal goal for urban food policy?

It is very difficult to compare self-sufficiency studies.

The environmental benefits of self-sufficiency need to be studied further.

Cities should aim for circularity rather than resource self-sufficiency.

Building on great expectations regarding urban agriculture, many scientific studies have looked into cities' self-sufficiency potential. What conclusions can we draw from this consolidated body of work? An article published in the *Journal of Cleaner Production* reviews this literature and shows that, on the one hand, that it is very difficult to compare such studies, and, on the other, that cities should focus on circular and sustainable practices rather than sufficiency.

## Many self-sufficiency studies, no single answer

Self-sufficiency studies, i.e. the analysis of the potential of urban agriculture to feed the city, have blossomed over the last decade. Each time, these studies take one, or a very small number of case studies. The article shows that **their results vary greatly**, from urban agriculture being able to meet as low as 2% of fruit and vegetable demand to figures as high as 400%.

How can we account for such a difference? Is this because cities have different layouts, and hence different growing potential? Surprisingly, answering this question is harder than expected, as the researchers found that **the methodology chosen by self-sufficiency studies is more decisive than cities' density**.

## Different hypothesis leading to different results

Indeed, self-sufficiency studies are hardly comparable because they rely on different hypothesis regarding:

- **The type of food considered:** some studies look at multiple food categories while others focus on fruit and vegetables only. The latter

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Source:

[Till Weidner, Aidong Yang, Michael W. Hamm, "Consolidating the current knowledge on urban agriculture in productive urban food systems: Learnings, gaps and outlook", \*Journal of Cleaner Production\*, Volume 209, 2019, Pages 1637-1655,](#)

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tend to show better results, as it is unlikely that urban agriculture can provide food items such as cereals or transformed goods.

- **The area available for urban agriculture:** it is not easy to estimate which proportion of urban land is available for food growing. Depending on the method used, results can vary greatly. The most robust methods are the ones that take into account all growing constraints. For example, it is not enough just to look at the amount of rooftop in a city. One should also consider whether they are shaded or not, and whether the building's structure can accommodate urban agriculture.
- **Yields** can vary greatly depending on food items and growing techniques. Many studies choose to apply figures from soil-based, non-conditioned growing techniques, which are less productive than techniques such as hydroponics or aquaponics. As a consequence, studies which take low yields hardly find self-sufficiency attainable. The researchers argue for more realistic yield data (coming from commercial scale projects, and including different crops) to be incorporated in these studies.
- **Urban diets:** some studies consider actual diets, while other choose to assess sufficiency against recommended fruit and vegetable intakes. As people tend to eat less fruit and vegetable than what is recommended, studies assuming a change in diet find it more difficult to achieve self-sufficiency.

Given the great diversity of methodology and hypothesis, it is quite difficult to draw a conclusion. What would be great would be to compare various cities with the same methodology. This is what Till Weidner, the article's lead author, is doing as part of his PhD research.

His recommendation for urban decision makers carrying out self-sufficiency studies is to pay **particular attention to the growing techniques and crop types they plan to employ** as those methodological choices can lead to very different results and hence very different policies.

### Sufficiency... and its environmental limits

Although increasing self-sufficiency works as a great catch phrase, the review therefore shows that it is a somewhat elusive metric. Interestingly, this article also opens another set of questions regarding whether it is desirable from an environmental point of view. In other words, **would it be more environmentally friendly to produce all the food urban dwellers need within the city?**

Here, existing literature shows that the image is not clear-cut.

- First, **literature shows trade-offs between high yields and energy consumption.** Innovations such as greenhouses or vertical indoor farming, or, indeed, any kind of controlled environment that enables high-yields, come at a great energy cost. Whether they represent an improvement from conventional methods will depend on what these methods are, whether they use a lot of energy, and whether this energy come from fossil fuels. For instance, fruit and vegetable consumed in Lisbon come from open fields within the region, so replacing them with produce from rooftop greenhouses would increase their environmental impact.
- Second, **there is still very little literature regarding the overall sustainability of an urban food system that would heavily rely**

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**on urban agriculture.** Which kind of storage and processing would it need? What are the means of (low-carbon) distribution? How would this impact transportation in the city? Research and practitioners still need to work on these topics before we can conclude that it makes environmental sense to bring back food production in the city.

### Should cities aim for circularity rather than sufficiency?

If self-sufficiency is not achievable nor sustainable, what should cities do? According to Till Weidner, **it is important that cities remember that their objective is not so much self-sufficiency, but decreasing the environmental footprint of their food system.** Two approaches may be beneficial for cities to achieve this objective:

- First, **experiment with and promote participatory business models**, such as community-supported-agriculture or pick-yourself schemes. People's involvement in the growing and harvesting process might be best suited to elicit sustainable behaviour change (e.g. food waste reduction, plant-based diets, seasonal consumption and reduced packaging).
- Second, **cities should explore all available options to decrease the environmental impact of urban agriculture.** Local resource circularity (i.e. the ability for urban agriculture to use urban waste streams such as water or organic waste) should be more systematically explored, as not much is known today about new integrated schemes (such as micro-scale, on-site, anaerobic digesters, or greenhouses utilizing building waste such as heat or CO<sub>2</sub>). Further, existing sustainable practices such as agroecology and permaculture could be adapted to urban contexts. Here, according to Till Weidner, **it is key that urban food policies incentivise people to take the risk to try new things as much needs to be done before we can conclude regarding the benefits of urban agriculture options.**

As such, self-sufficiency should be considered as a potential means to an end, but its environmental (as well as economic and social) benefits and limits be seriously scrutinized before it is integrated in urban food policy.

