

Urban food, energy and water: connecting the dots



Food policy is not only about food, but also about energy and water.

Cities should adopt an integrated approach to infrastructure planning.

Understanding resource flows and evaluating possible trade-offs is key.

If the food system needs water and energy, then food policy should pay attention to these resources. Research into the interconnections, and possible trade-offs, between the three basic resources for human activities has boomed over the last few years. Time to take stock and look at what lessons cities can draw out of them. A recent article published in *Resources, Conservation and Recycling* by a Beijing (China) and Michigan (USA)-based team, reviews existing literature on the topic.

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Food is not only about food...

Food, energy and water are the three basic environmental resources any human settlement needs. However, policies that deal with them are often developed in silos. The article points out that it is important to look at them together. Indeed:

- These resources are **interconnected**. This is what the research community and the international institutions such as [FAO](#) call the "Food-Energy-Water Nexus". If the energy or water system fails, then the food can fail too.
- They are dependent not only on each other, but also on external environmental factors, such as climate.
- **This interconnection is even more important in cities because urban areas do not produce these resources.** They depend upon other parts of the country or the world.

So, a first takeaway for cities embarking on food policy is **that food is not only about food. It is also about energy and water.**

Source:
[Zhang, P., Zhang, L., Chang, Y., Xu, M., Hao, Y., Liang, S., Liu, G., Yang, Z., Wang, Can. \(2019\). "Food-energy-water \(FEW\) nexus for urban sustainability: A comprehensive review", *Resources, Conservation and Recycling*, Vol. 142, pp. 215-224](#)

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... and urban infrastructure planning is not only about planning in: the city

Because resources are flowing from the hinterland to the city, the authors insist that any resource planning should look beyond the city borders. In other words, urban infrastructure planning is no longer about planning for the city only. They highlight that *“the impacts of cities outside of their immediate geographies and their relationship with Food-Energy-Water resources must be considered in the planning and policy”*.

Here, a key point is to pay attention to infrastructure, and, more specifically, to **adopt an integrated approach to infrastructure planning** ([see our previous article on the topic](#)). The more integrated the planning, the better. The authors quote [Integrated Water Resources Management](#) as a good example of a holistic approach to resource planning.

So, to ensure their future food supply, cities should take a double step back, and understand that their urban food strategy is not only about food, and it is not only about the city.

What can cities do?

Connecting the dots between infrastructures (and between issues!) can be difficult for cities, especially as the “Food-Energy-Water nexus” is still pretty much a research topic.

However, action can be taken to prevent future systemic failures. Depending on how far cities want to go, they can rely on a diversity of methods. Some of them are still being developed in labs. Nonetheless, a lot can be done.

- **Step one: understand and quantify resources flows.** This can be achieved through two main methodologies. The first one, life-cycle analysis, calculates the environmental impacts (hence the resource uses) of a product or a service. The second one, called input-output analysis, captures the resources flows coming in and out of the cities. Both methodologies are widely used and robust.
- **Step 2: use modelling to evaluate the impact of your policies before implementing them** and forecast evolutions. In order to do that, cities need to use models and tools that not only understand the relationships between resources, but that are able to predict the way these can evolve. These tools are central to identifying trade-offs between policies ([see our previous article on water use in urban agriculture](#)). An example is the [Climate, Land \(Food\), Energy and Water strategies approach \(CLEWs\)](#).
- **Step 3: optimize resource and infrastructure use.** Here, cities may find that models are not operational yet. Research is still in the infancy. A good reason to collaborate with researchers to make the most of their results!

