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THE POLICY ENVIRONMENT FOR SUSTAINABLE CRFS
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CIRCULARITY AND THE DEVELOPMENT OF SUSTAINABLE CITY-REGION FOOD SYSTEMS

Roof Water-Farm hydroponic greenhouse, Berlin, Germany. Photo: Grit Bürgow.

INTRODUCTION

Sustainable City-Region Food Systems have great potential to contribute to the transition to a circular economy. They could help close resource loops for a number of crucial resources

- which are becoming increasingly scarce - e.g., freshwater - and
- which are highly destructive to extract or produce - e.g., nitrogen, phosphate and potassium from fossil sources, animal feed such as soya produced on deforested land – or
- which are currently a waste product but could be converted into a resource - e.g., heat from buildings contributing to urban heat stress, or food waste from catering and other sources that are currently "downcycled" for biogas or even disposed of altogether.

The European food system in its current form is in many ways the opposite of a circular system: it relies heavily on fossil resources, water and inputs from deforested land imported from around the world into Europe, where the final product and associated waste are produced. The long transport distances make it impossible to close these resource loops and create problems at both ends rather than solutions within a loop. In theory, City-Region Food Systems have a very high potential to function as a more circular system than the current globalised food system, but certain regulations or even the lack of such regulations at EU and national government level prevent further development in this direction.

CHALLENGES FOR SUSTAINABLE CRFS

EU regulations on wastewater recycling for urban agriculture

For the grey and black water recycling sector in (urban) agriculture, there is a new EU regulation on minimum requirements for water reuse (2020/741), which was adopted in May 2020 and is currently being processed by member states for national implementation. This could open up new opportunities for greywater recycling to play a greater role in the CRFS if treatment and hygiene control requirements and permitted uses are formulated in such a way that smaller plants can demonstrate safety through treatment processes that are described as safe; rather than, for example, weekly laboratory testing. Another policy element that is missing for widespread implementation of this practice is the creation of incentives and possibly mandatory separate collection of grey water in new buildings and renovations of buildings above a certain size.

EU regulations on animal feed

Another area where waste streams could be turned into a valuable resource if the policy environment allowed it is animal feed. The regulation on animal protein (commonly known as the "Feed Ban"), adopted in 1994 and extended in 2001, which prohibits the feeding of any type of animal protein to certain farmed animals was amended in 2021 to allow the use of seven different species of insects as animal feed. However, the restrictions on what the insects themselves may be fed remain in place and preclude the use of kitchen waste and other potential sources of insect feed that would make insects a sustainable option by reducing the need for agricultural land for animal feed.

EXAMPLE OF CHALLENGE

The worsening freshwater crisis in many countries shows that water recycling is urgently needed. Technologies for small-scale greywater recycling, including monitoring and treatment systems are available and have been proven successful in both soil-based agriculture and in vertical farming systems based on hydroponics. Nevertheless, the policy environment for the implementation of this innovation is not yet in place. An example of this situation is the "Water House" in Berlin, which was developed and operated by Nolde and Partner for environmentally conscious developers and built as a "lighthouse project" with partial state funding. Proven safe and hygienic, it recycles up to 10 m³ of grey water to irrigate residents; allotments and a hydroponic greenhouse, and to supply toilets for 73 households. On the small scale on which it currently operates, it is more of an enthusiast proposition than a profit- seeking business.

EMERGING INNOVATION

1. Advantages of physical proximity

A locally integrated food economy - from farm to table to waste disposal and recycling - reduces transport costs, so that a resource cycle can be the more economical option. The food system can be interwoven with the urban fabric and other social and economic activities in the city by bringing together actors of different parts of the system and improving synergies more easily. This also includes a closer relationship between consumers and producers, creating a basis for greater awareness, respect and solidarity, leading to more sustainable consumption choices and/or active engagement as prosumers.

Greywater treatment plant at Water House, Berlin, Germany. Photo: Erwin Nolde.

2. Savings on infrastructure

The small-scale, highly localised use of treated greywater typical of a CRFS would not require a large upfront investment to build a separate wastewater system. Instead, a very large waste stream would be treated at its many points of origin and converted into a valuable resource that could also be used directly on site (or in close proximity), both for urban food production and for irrigation of parks and green roofs.

3. Nutrient recycling

A complementary approach that focuses on diverting nutrients from wastewater before they become pollutants is demonstrated by the start-up TOOPI, based in Bordeaux, France: working with organisers of large events and using specially-designed toilets, urine is collected separately and fermented to make it safe and hygienic, creating a valuable source of fertilizer for agriculture that is both cheaper and more effective than synthetic equivalents. TOOPI has received funding from the French Agency for Ecological Transition to take their process from proof-of-concept to implementation at scale, building processing facilities and a network of partner institutions in several French cities.

4. Food waste upcycling

Similarly, the production of insects as a sustainable high-value animal feed with the potential to replace destructive soy and fish meal, and also for human consumption, using catering and other waste products has been practiced in many parts of the world. Various aspects of insect production for food and feed have also been the subject of research by the FAO since 2003 and by European research institutions such as Wageningen University for about a decade.

RECOMMENDATIONS

1. Raise awareness of the need to use resources more sparingly, including freshwater, and disseminate information on the circular economy to the general public.

2. Implement regulations for the use of grey water in agriculture with provisions for use in typical urban crops and for safety control systems suitable for small farms.

3. Make separate greywater collection in all residential buildings above a certain size a legal requirement, combined with a support programme. (A model for this lies in the renewable energy programs such as the German 1,000 Roofs Programme and the Renewable Energy Sources Act (EEG), which kick-started decentralised solar energy generation in Germany).

4. Legalise the use of kitchen waste and other waste products that have been proven to be both safe and sustainable for use in the production of insects for anmal feed.

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