

AgriSan-Increasing Urban Self-Sufficiency by Integrating Urban Agriculture and New Sanitation

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Motivation

More than half of the world's population currently resides in cities, contributing to a host of environmental problems. High quality inputs, such as food and drinking water, enter the city, and low quality outputs, such as diluted wastewater, exit the city without consideration for reuse and recycling (**Figure 1**).

A paradigm shift is needed to a circular metabolism, in which waste from one process equals food for another (**Figure 2**). Coupling Urban Agriculture (UA) and New Sanitation (NS), presents an opportunity for resource exchange for mutual benefit.

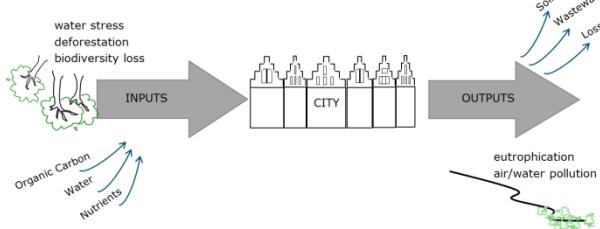


Figure 1: Linear metabolism, nutrient and water flows

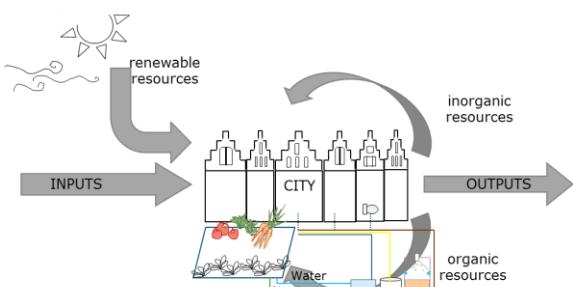


Figure 2: Circular metabolism, nutrient and water flows through integrated urban agriculture and new sanitation

Technological/Methodological challenge

The compatibility of water and nutrient flows between UA and NS is unknown, in terms of quantity and quality (parameters for human and environmental hygiene). In addition, no methodological tool currently exists to match their input-output flows and establish a "common language" between the two systems, exploring options, constraints and trade-offs

Objective

To understand of the compatibility of UA and NS, and their nutrient and water flows, to increase urban resource management

- Quantify and qualify input-output flows and identify relevant temporal and spatial patterns
- Develop suitable criteria for compatibility and matchmaking
- Develop and test a simulation model that matches input-output flows under context-specific conditions
- Develop ranking methodology for integrated UA/NS concepts
- Validate the developed framework for various urban settings

This research aims to provide clear recommendations on where and to what extent urban agriculture and new sanitation can create fruitful synergies and local solutions



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