

Investigation of past experiences with alternative sanitation for nutrient recovery across Sweden

Background

Human activities are profoundly altering critical nutrient flows that underpin productive ecosystems and life on earth. Factors such as the rise of waterborne sanitation and synthetic fertilizers, increased urbanization, as well as globalization and industrialization of food and farming systems have brought about a linearization and globalization of nutrient flows. Balancing nutrient flows between human settlements and the rest of nature within planetary boundaries is essential for life on earth and for safeguarding biodiversity and ecosystem services, notably healthy water bodies and soils. Recirculating nutrients in human excreta and other organic residuals to agriculture can make important contributions to more circular nutrient flows and improved food security.

Although Sweden has yet to achieve full circularity with human excreta, there is a long history of projects implementing small or medium sized alternative sanitation projects to contribute to this objective. The End-of-Wastewater project (link below) has identified 50 cases across the country. Many of them have stopped their operations and lessons learnt from these projects are not centrally available or synthesized to facilitate learning and expansion of circularity in Sweden. In order to design desirable systems, and upscale human excreta reuse processes, we need to better understand previous success and failures with alternative sanitation options.

Read more about the project: [End-of-Wastewater Project](#)

Objectives

The aim of this thesis is to delve deeper in to selected Swedish case studies where communities have already implemented an alternative sanitation technology to facilitate nutrient recovery and investigate the financial, logistical, and cultural factors that affected the longevity and success of each project. These will be added to an online database to help stakeholders learn from the cases, and the student will also synthesize the results in a report.

Proposed Methodology

The project will include a literature review of relevant materials (peer reviewed papers and government and organization reports). This review will help determine which types of data should be collected for each case, and when available filled in for well documented cases. It will also help determine the number of cases to look at in more depth. Primary data collection will be done by contacting relevant organizations for each case study to either gain access to more detailed documents and conduct an interview to collect knowledge that has not been well documented (focus on success and failure aspects). Data will be quantitative (e.g., costs associated with a project, amount of biofertilizer produced) and qualitative (e.g., legislation, difficulty of use). For each selected case, the student(s) will collect data in a standardized matter and then compare across the cases.

Qualifications

Students with a keen interest in development and dissemination of sustainable solutions, can read and speak Swedish, and is interested in interview work is an asset.

Other information

Language:	English and Swedish
Proposed time:	5-6 months
Location of Research:	Linköping University or Swedish University of Agricultural Sciences (SLU)
Contact person:	Genevieve Metson: genevieve.metson@liu.se Jennifer McConville: jennifer.mcconville@slu.se