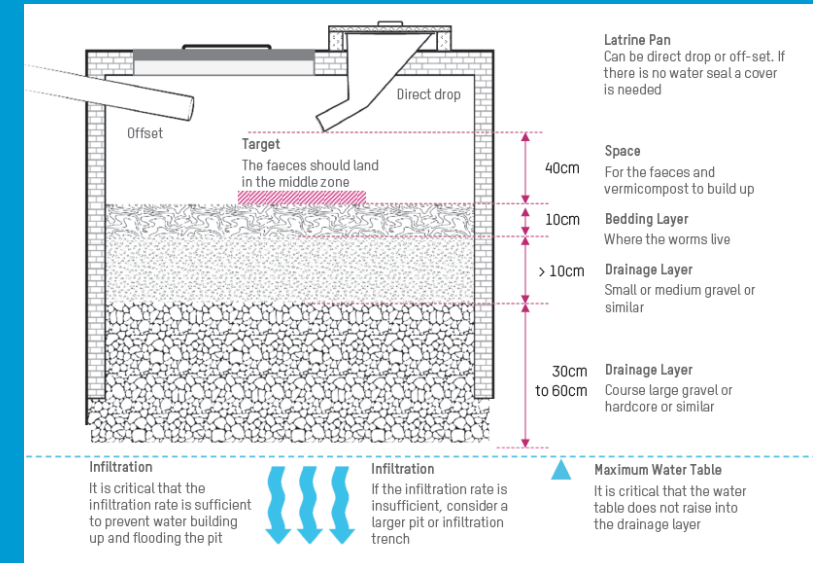


Learnings from containment research

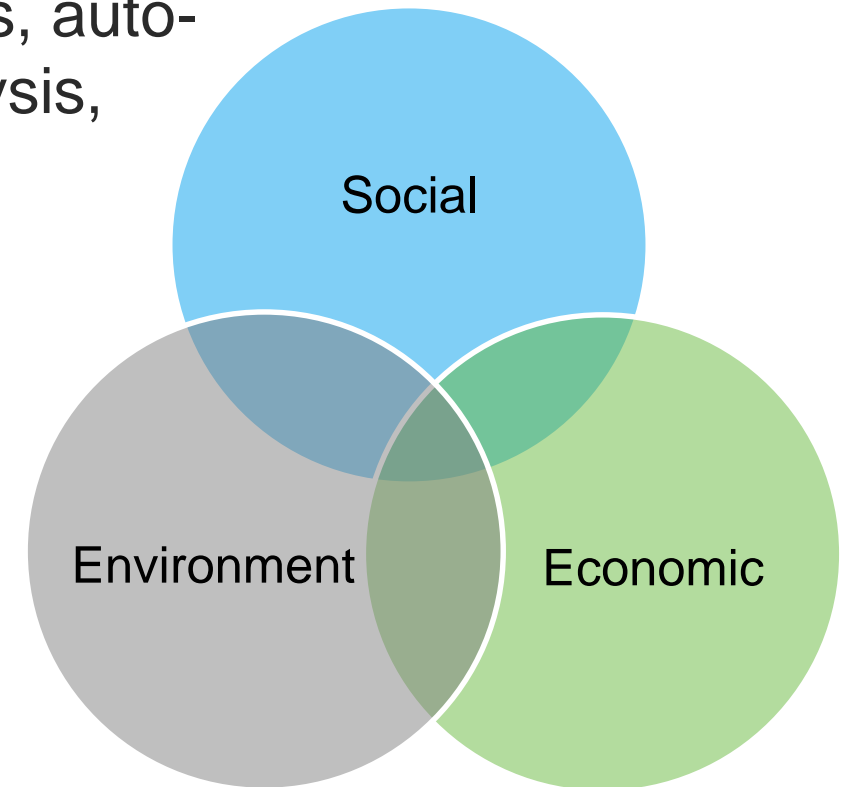
Claire Furlong

IHE Delft



My history

- Environmental engineering (background)
 - Novel technologies for strong and hazardous waste
 - Anaerobic digestion, WAO, novel absorbents, auto-thermal thermophilic aerobic systems, pyrolysis, vermifilters
- Nexus of people and technology



Do we mean by containment?

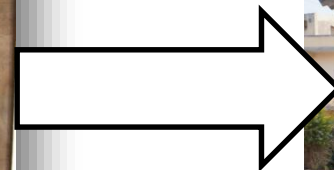
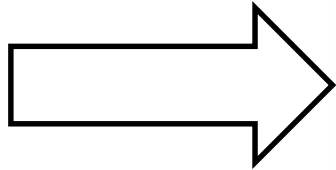


**Containment +
Treatment**

**Containment +
Partial Treatment**

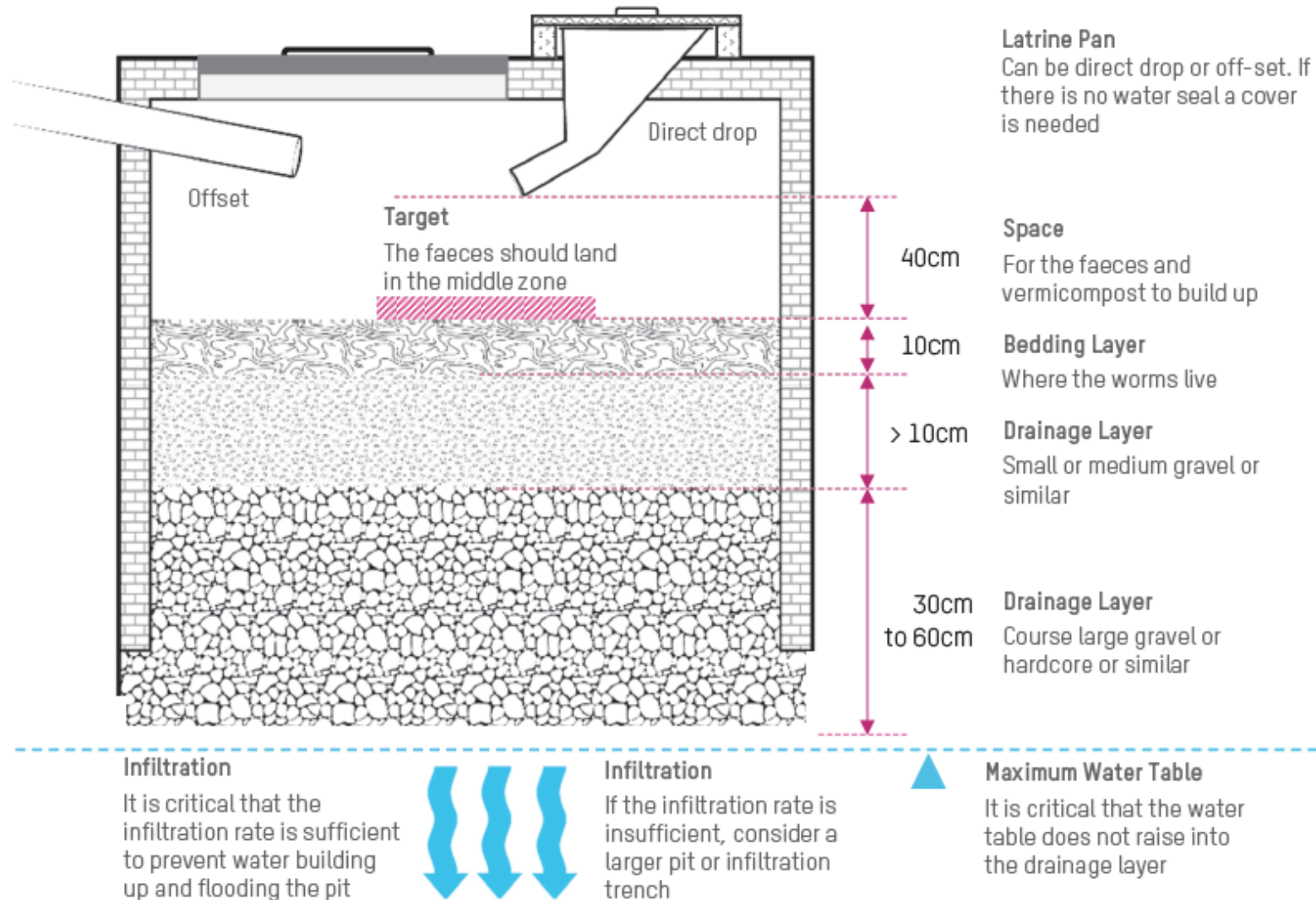


Proof of concept to scale...

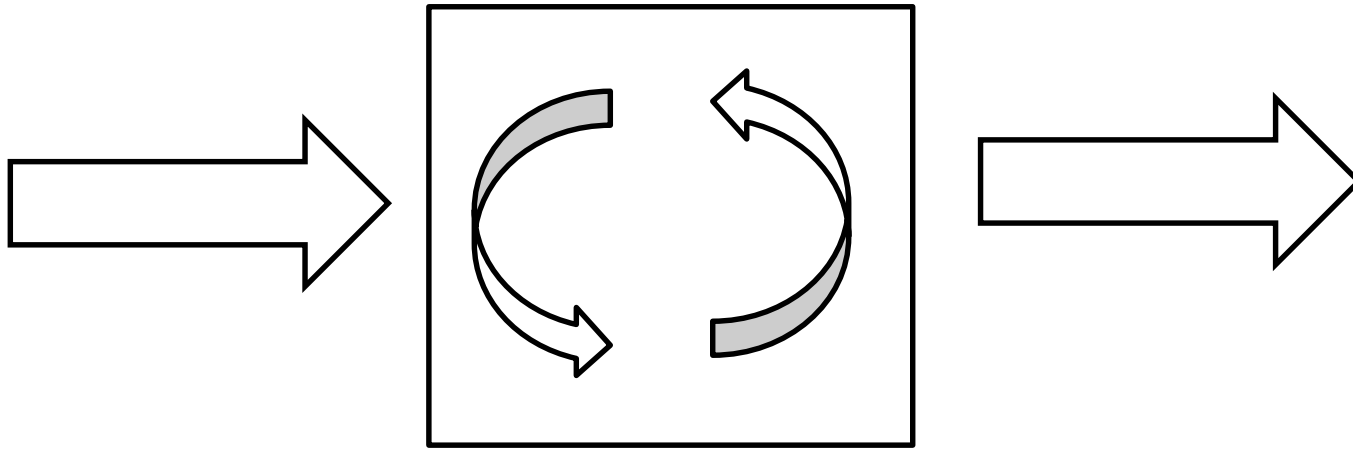


- Approx. 600 toilets
- Approx. 6,000 users

My research

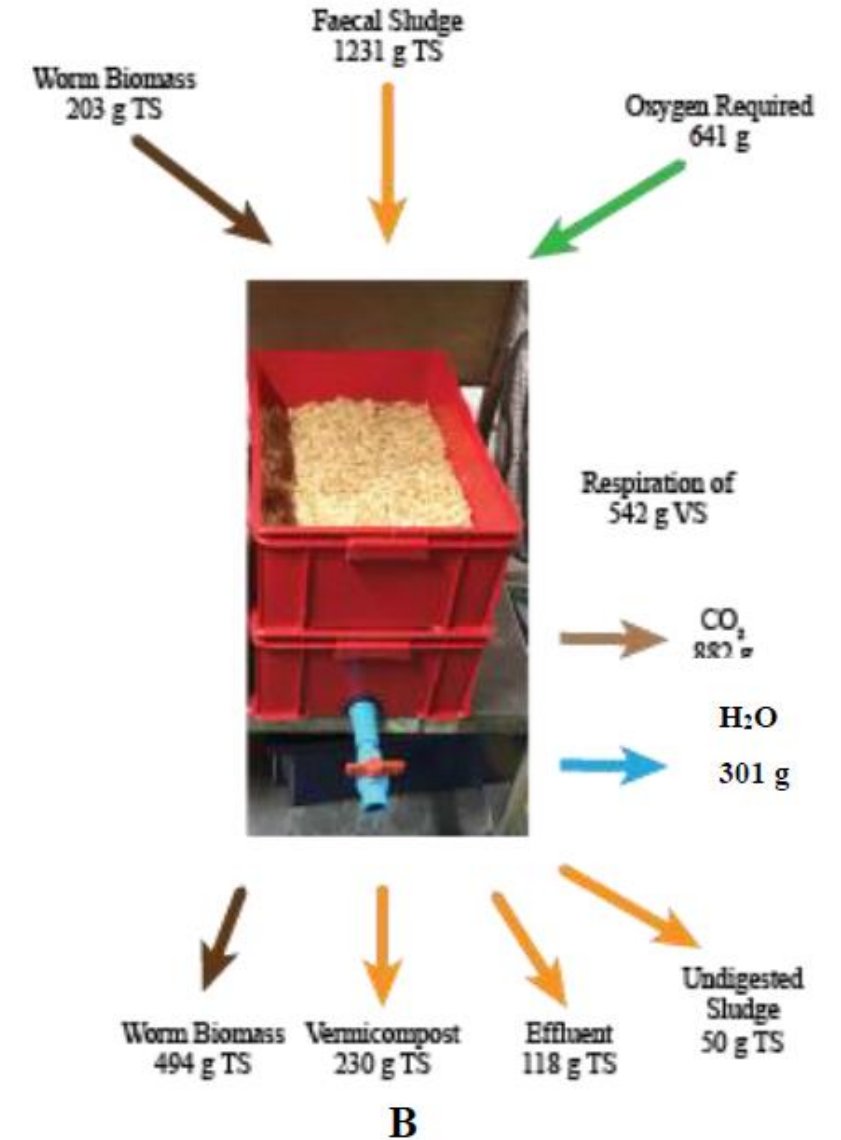


Your biological system...



Important questions

- What goes into your system?
- What comes out of your system?
- What other factors affect your processes?



Challenges....

- Time required
 - Cannot speed up biological processes
 - Sustainability (O&M) field trials
- Sample analysis
 - Sampling?
 - Analysis... where?
- How to monitoring in field
 - Development of indicators
- Only monitor – what you are looking for...
 - Unintended consequences

Processing of human faeces by wet vermifiltration for improved on-site sanitation

C. Furlong, M. R. Templeton and W. T. Gibson

ABSTRACT

The use of a vermifilter containing *Eisenia fetida* to degrade human faeces in a continuous wet system was explored. This paper aimed to understand the formation of vermicompost within the system, the quality of the effluent produced, and the effect of different bedding matrices. Eight filters were constructed, utilising four different bedding materials: four of these systems were seeded with 400 g of worms (vermifilters) while the others served as controls. The systems were flushed with 12 L of water per day and the experiment was split into five phases, each with different feeding regimes. Between 23.7 and 24.7 kg of fresh human faecal matter was added to the vermifilters over the 360 day period. The presence of the worms was found to increase the faecal reduction to 76% on average, compared to 17% in the control systems on average. Statistically significant reductions in phosphate, chemical oxygen demand and thermotolerant coliforms were achieved in the effluent of all vermifilters. The most suitable bedding matrix was a mixture of coir and woodchip. This study shows that there is potential for continuous treatment of human faeces using wet, on-site vermifilters.

Key words | *Eisenia fetida*, sewage, vermicompost, vermifilter, vermireactor, worm

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User engagement/acceptance is a huge part of containment research!