

Implementing an engineering field testing platform for sustainable non-sewered sanitation prototypes

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Overview

- What is the sanitation challenge and how can this be addressed?
- What is the engineering field testing platform?
- How does the engineering field testing platform work?
- What are the benefits of such a platform?



Addressing the sanitation challenge

- > 40% of world's population practice open defecation or have a lack adequate sanitation facilities
- Move towards on-site, decentralized technologies with recovery and reuse
- Development of the “Reinvented Toilet”

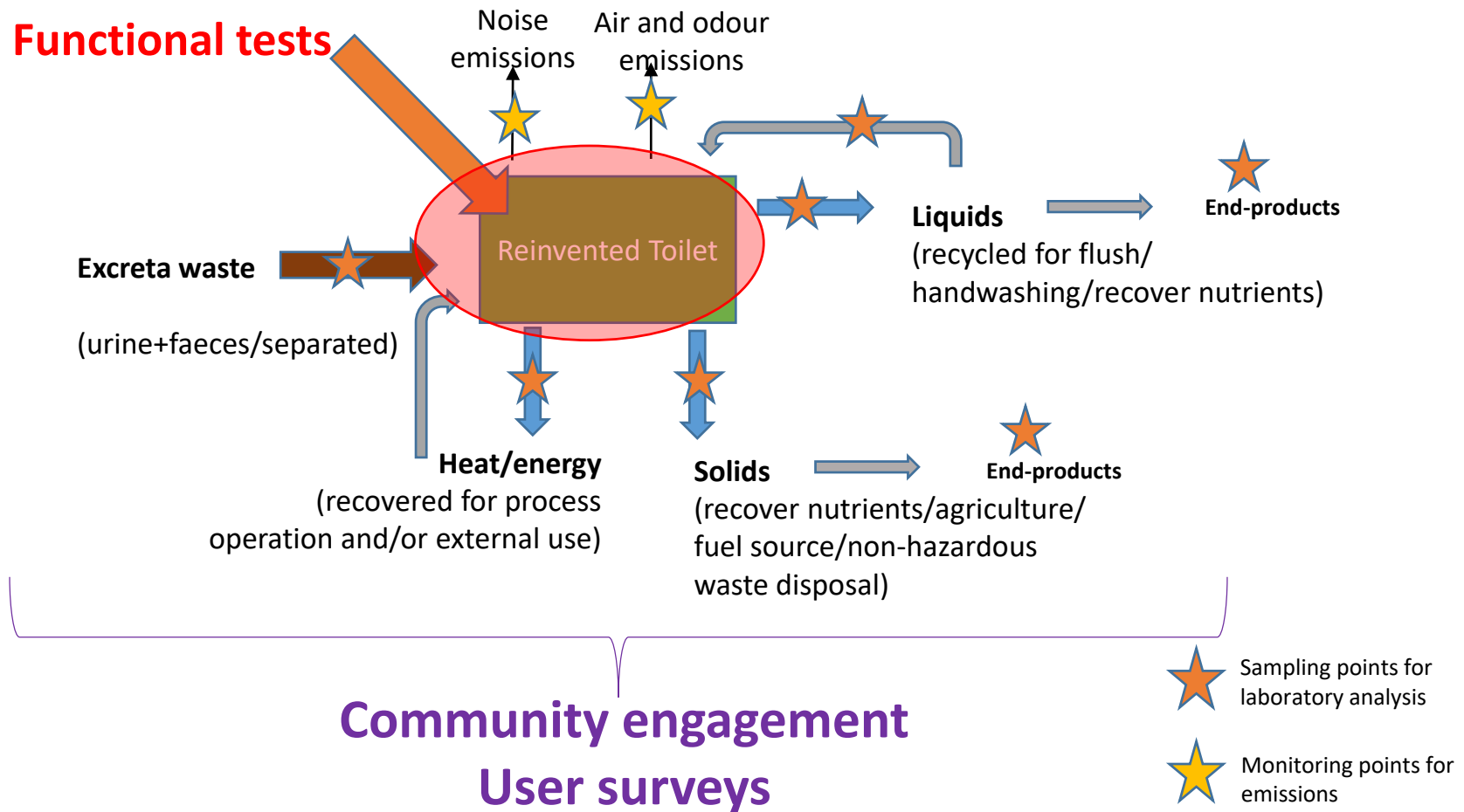
What is the EFT Platform?

The Engineering Field Testing Platform aims to:

- Test reinvented toilets in a real-world environment with many users
- Monitor and evaluate the performance over an extended period of time
- Obtain feedback from community members as to the suitability and impact
- Use the information and data generated to improve sanitation for all



What is meant by “engineering field testing” ?



Role players and stakeholders

Role player /stakeholder	Contribution to EFT Platform	Benefit from EFT Platform
Technology developers	Reinvented toilets	- Real world testing - User feedback - Logistical, technical and laboratory support
EWS	- Access to sites - Community engagement - O&M support	- Early exposure to new sanitation systems - User feedback - Testing of new systems before implementation
UKZN (PRG)	- FS laboratory - Engineers - User surveys	- Research collaborations - Access to funding
Khanyisa Projects	- Logistical support - Site preparation - Civils and construction	- Building capacity and skills - Access to funding
Community	- Feedback on systems - labour	- Job opportunities - Contribution to knowledge
Funders	- Funding - Long term vision	Rapid development of on-site sanitation technologies

How the EFT platform works

STEP 1

- Site selection

STEP 2

- Ethical approval

STEP 3

- Community engagement

STEP 4

- Site preparation

STEP 5

- Installation and commissioning

STEP 6

- Functional testing: sampling, lab analysis, feedback

STEP 7

- Decommissioning

Reinvented toilets on the EFT platform

Household

- Pedestal with dry flush, separation and treatment of solids & liquids
- Flushable urine diversion pedestal
- Drying and burning of mixed excreta to recover energy
- Stabilisation of urine to produce fertiliser

Community

- Drying & burning solids and electrochemical treating liquids for reuse
- Anaerobic and electrochemical treatment for reuse
- Anaerobic membrane bioreactor and electrochemical treatment for reuse
- Handwashing station that recycles water

Household or community

- Microbial fuel cell processing of urine to produce electricity
- Innovative drying technology for FS

Challenges

- Limited suitable sites
- Illegal service connections
- Political interference
- Continuously changing time line
- Security
- Communication (language barriers)
- Unforeseen events leading to delays (e.g. electrical compliance/earthing)



Lessons learned

- Involve local team early to assist in site selection, preparation, advice on local conditions
- Provide early training to local engineers on operation of system
- Detailed discussions to prevent scope creep and impact on budget
- Careful management of publicity
- Need continuous community engagement
- Advantage to testing systems within close proximity to one another



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