



# What is the future of pit emptying and faecal sludge treatment in emergencies?

The need for diversification

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Emergency Sanitation  
Project

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# Top Sanitation priorities

## Findings Gap Analysis by Humanitarian Innovation Fund

- *Containment:*  
'no dig' latrines
- *Safe emptying*  
*Latrines:*  
raised & 'old')
- *Safe Treatment*  
collected Faecal  
Sludge



# Basic Options have been developed

## ESP, S(P)EEDKITS, Humanitarian Innovation Fund

- Applications in non-emergency 'development' sector
- Increasing sales various levels of use in emergency sector
- Field conditions emergencies vary → diversification needed



# Raised Latrines

## Now 'For Sale'

### Promote

- Use
- Knowledge & Awareness

### Challenges

- On-site treatment?
- Desludging without smell and spillage



**Emergency Sanitation Project**

Name	Cost in UK	Chargeable weight (kg)	Airfreight to Nairobi
Dunster House (right)	€ 175	108	£141
Flexxolutions (left)	€ 350	69	£91





# Raised Latrines (2)

## Add-ons available



# On-site Faecal Sludge Treatment? (1)

## Use ESP1: Raised Latrine & Transfer stations

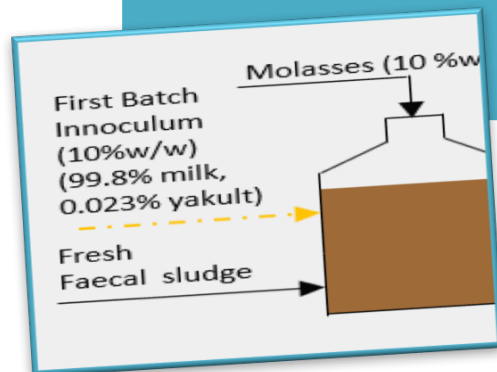
Lactic Acid



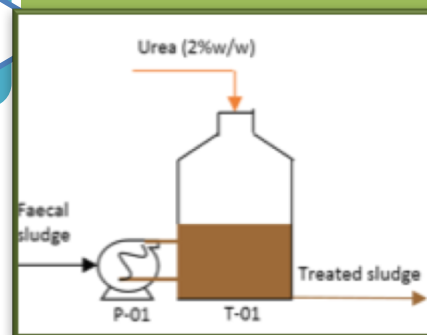
Urea



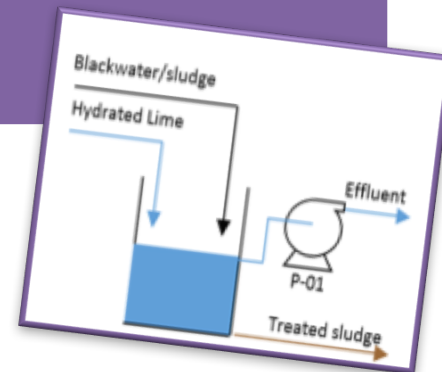
Lime



€ 2.2/m<sup>3</sup> (Molasses)  
€ 32/m<sup>3</sup> (Molasses,  
Yakult, milk)



€ 16/m<sup>3</sup>  
(20 kg urea)



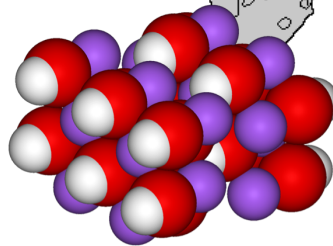
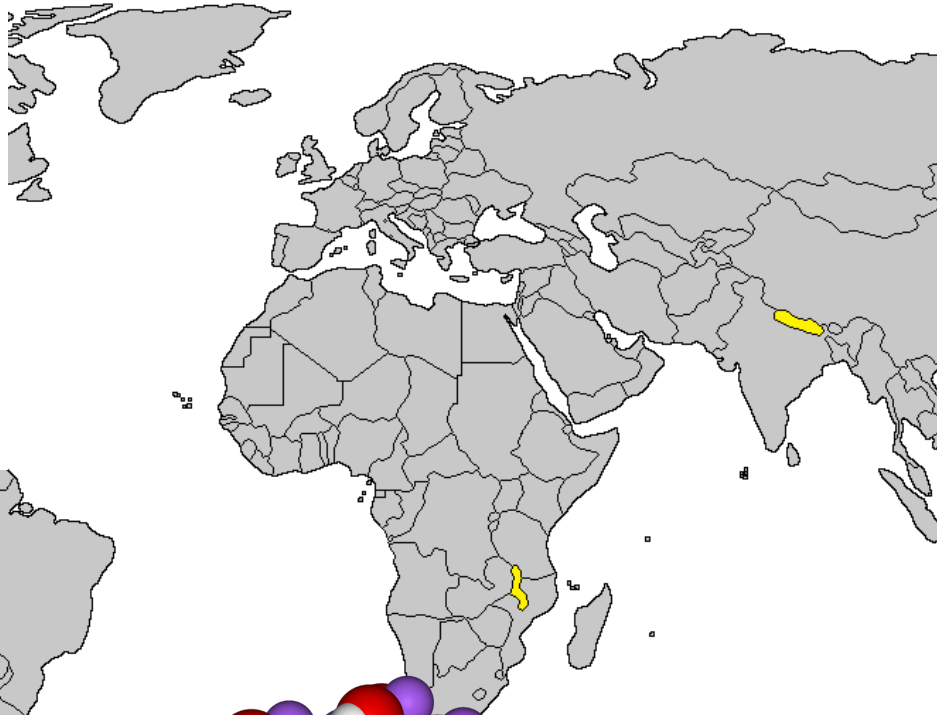
€ 12/m<sup>3</sup>  
(12 kg lime)

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# On-site Faecal Sludge Treatment (2)

Use findings HIF1 Speedy Sanitization



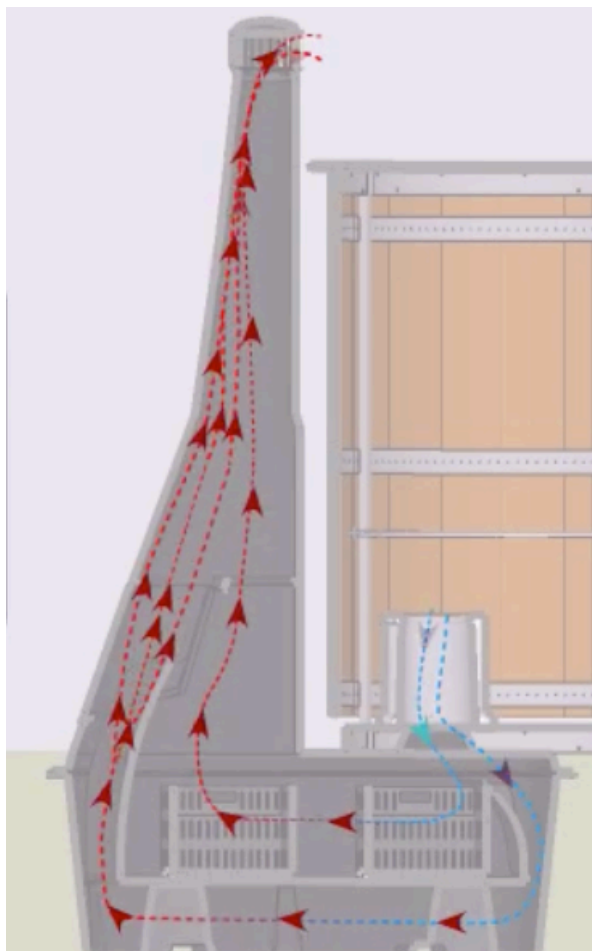
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Caustic Soda (NaOH)



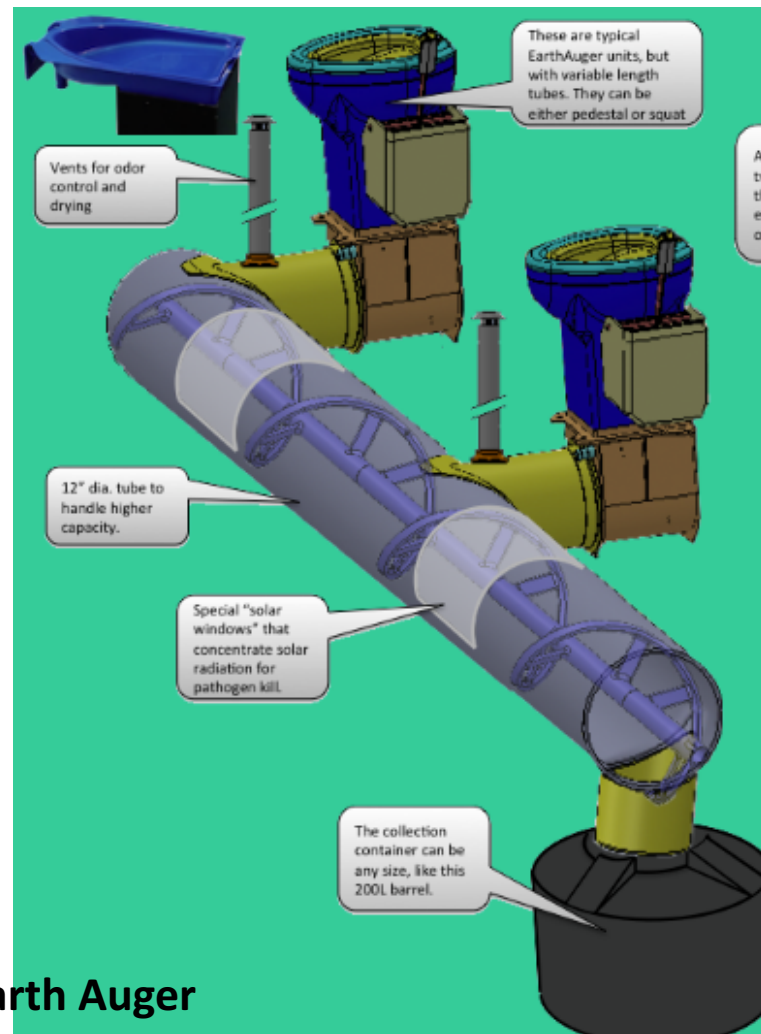
# On-site treatment (3)

## Test 'proven/ promising' systems



Kazuba

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Earth Auger





# On-site treatment (5)

## Vermicomposting

- Appropriate for contexts: regular flooding, high water table, rocky ground, costly desludging
- Closing sanitation loop through faecal sludge-derived compost ('vermicompost' from Tiger Worm digestion – yet to empty, but projects every)
- Ecological sanitation option with dignity & comfort for h/holds (especially women)
- Trials ongoing in urban (peri) areas – Liberia, and Sierra Leone, and in camp settings – Ethiopia and Myanmar
- Investigating direct drop, and off set designs

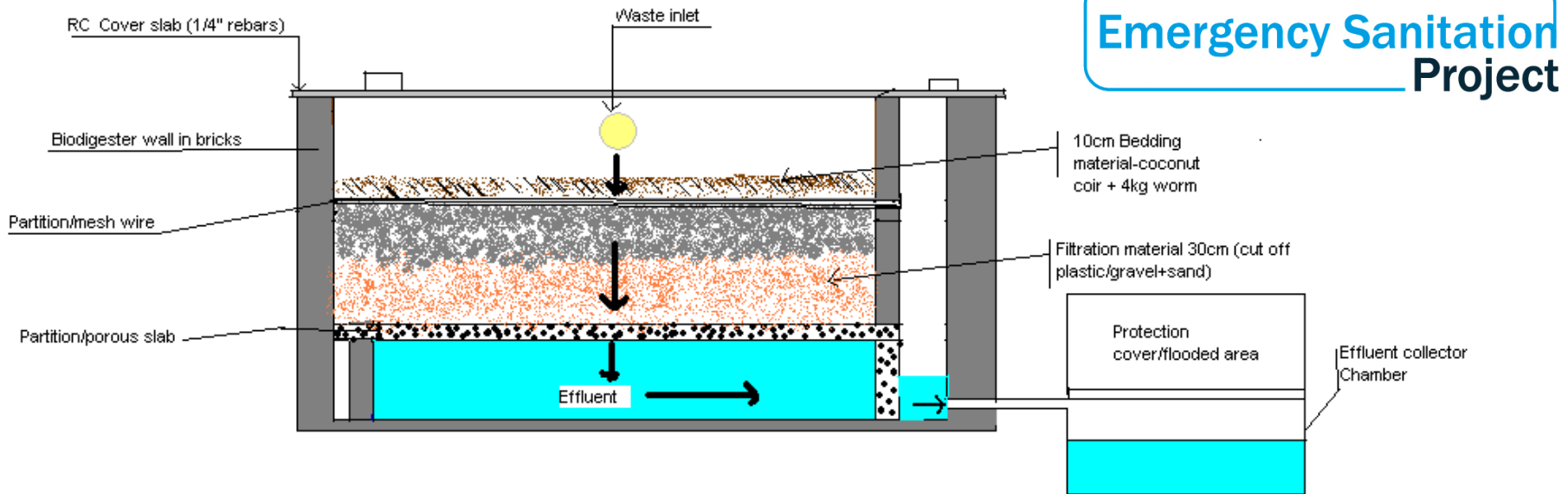
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# On-site treatment (6)

## Inside the digester...



# Optimize emptying raised latrines

No spillage, no smell

ESP2:

- Membrane pumps & Anti trash
- Macerator

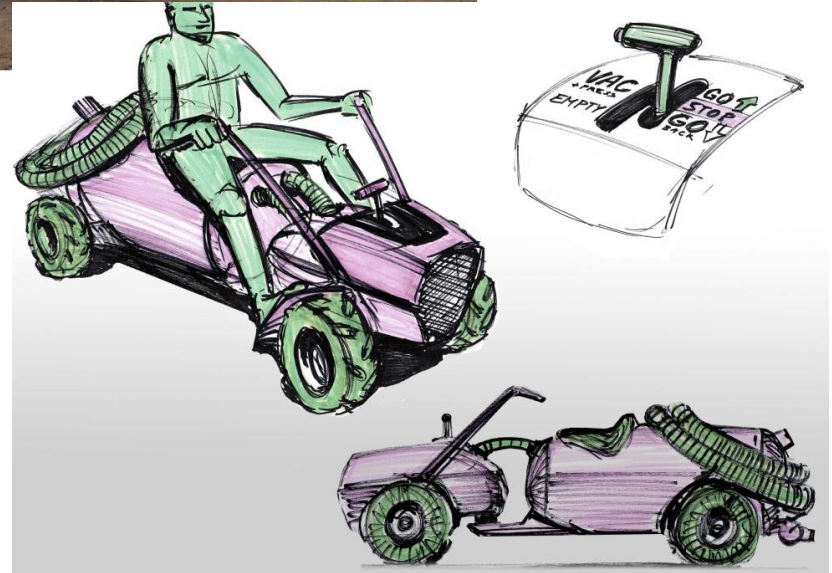




# Emptying of pits in 'difficult' areas

## Variations to the ROM desludging unit

- A smaller unit
- A larger unit
- Efficient tools to fish



# Emptying of pits in 'difficult' areas

## Transfer stations

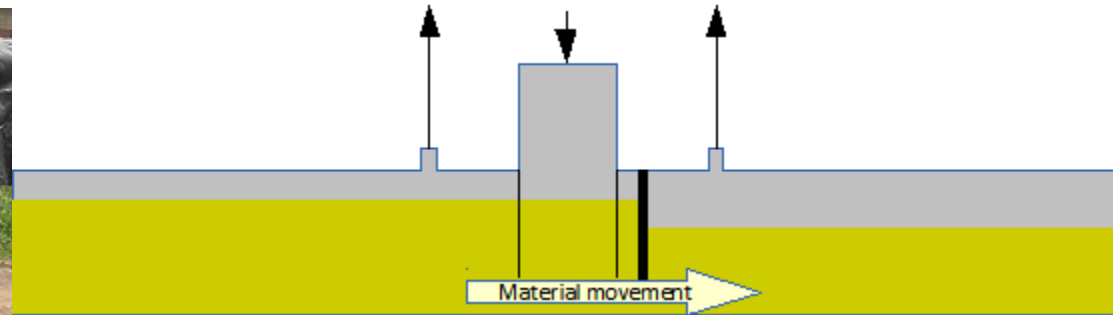
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# Central treatment of faecal sludge (1)

Apart from bio-chemical treatment heat treatment and anaerobic digestion ready for use



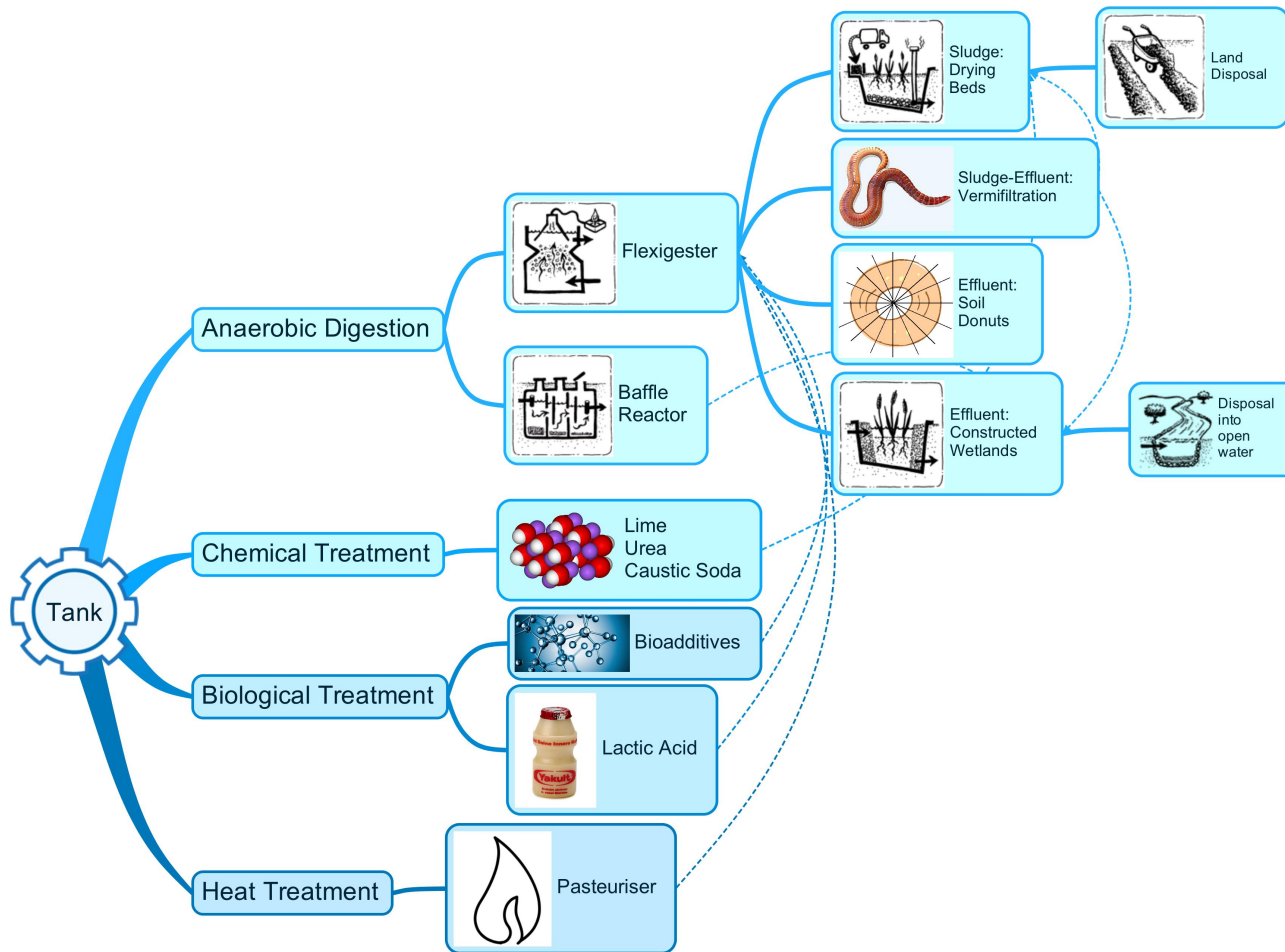
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# Central treatment of faecal sludge

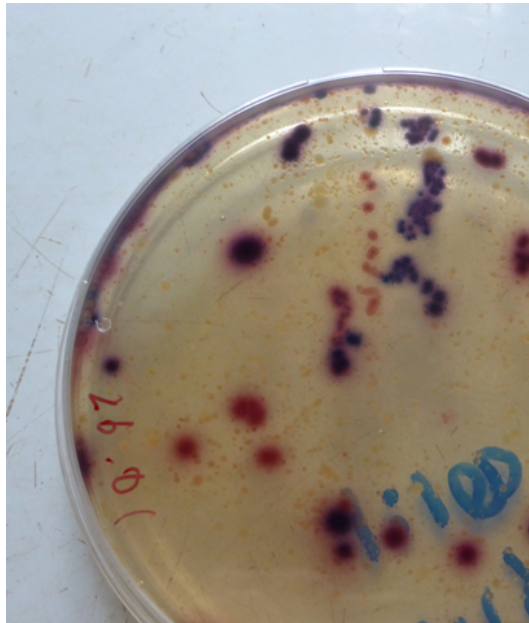
On our way to a 'multi-purpose' central treatment



# Monitoring Sludge Quality

## HIF Grant for development field kit

- Low Cost
- Reliable
- 'Quick & Dirty' results
- Microbiology



# Invitation

Any more alternatives we should test?

- On-site treatment and desludging
- Transfer stations
- Central faecal sludge treatment

**Thank you**  
For your input



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