

# THE USE OF ANAEROBIC TECHNOLOGY TO TREAT PIT LATRINE SLUDGE FOR BENEFICIATION



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## Project background

Anaerobic technology is currently being explored to treat pit latrine faecal sludge from peri-urban settlements of Harare and Chinhoyi, Zimbabwe, for:

- improved sanitation (elimination of pathogens)
- food security (soil conditioner/fertiliser)
- energy security (biogas generation)
- recycling of nutrients and C-sequestration

## Objectives

- To characterize pit latrine sludge from peri-urban settlements in Chinhoyi and Harare
- To assess potential of pit latrine sludge for biogas production using anaerobic technology

## Summary

- Pit latrine sludge characteristics vary from one pit to another within the same location.
- Pit latrine sludges contain relatively high concentrations of plant nutrients.
- Faecal sludges show high potential to produce biogas using anaerobic digestion.

## Materials and methods

- Study sites
- Field sampling
- Laboratory analysis



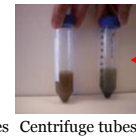
Pit latrine



Sampling



Faecal samples



Centrifuge tubes



Faecal samples



Anaerobic digester

## Results

### Microbial analysis

Sample code	Faecal (CFU/ml)	Helminth (ova/g)
Harare 1	$7 \times 10^5$	0
Harare 2	$3.9 \times 10^7$	0
Harare 3	$6.0 \times 10^7$	$3.2 \times 10^4$
Chinhoyi 1	$1.1 \times 10^6$	$3.5 \times 10^3$
Chinhoyi 2	$2.5 \times 10^7$	$1.0 \times 10^4$
Chinhoyi 3	$8.2 \times 10^5$	$2.3 \times 10^4$

### Chemical analysis

pH	COD (mg/l)	TP-P (mg/kg)	NO <sub>3</sub> -N (mg/kg)
8.0	12990	14920	<b>33600</b>
6.1	16710	56000	<b>56000</b>
7.0	22650	35200	<b>35200</b>
7.6	93380	22400	<b>22400</b>
7.1	10110	19200	<b>19200</b>
6.8	10980	20800	<b>20800</b>



Helminth eggs from study sites

