

Ecosan in Disaster Relief

Emergency Sanitation Workshop, Delft, June 13th, 2012



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Reasons for Selecting Ecosan

Current:

- High water tables
- Flood situations
- Where excavation is not possible

Potential:

- Foster a transition to sustainable development
- Reforestation and soil regeneration
- **Meeting the top requirements for raised latrines**

Ecosan Case Studies

1. **Urine Diversion Toilets:** Bolivia, Haiti, Chad, Philippines and Bangladesh
2. **Composting Toilets:** Haiti and New Zealand
3. **Terra Preta Sanitation:** Philippines
4. Arborloo: Haiti
5. Biodegradable Bags: Haiti

UD Toilets

- Bolivia
- Haiti
- Bangladesh
- Philippines
- Chad



OXFAM, Bolivia¹



OXFAM, Haiti¹



WAND Foundation, Philippines²



Terre des Hommes, Bangladesh³



SECADEV,
Chad⁴



Haiti : UD toilets with Centralized Composting

- Port Au Prince
- Supported by New Horizons Foundation
- The fecal matter was collected in 30 liter biodegradable bags
- Feces covered after each use
 - With earth or dry organic matter
- Richard Higgins Thermophilic composting process



Thermophilic Composting in Haiti 5

Home Composting Toilets in New Zealand



Emergency Composting Toilets in New Zealand⁶

Terra Preta Sanitation (TPS)

- Xavier Ecoville, Lumbia, Philippines
- Serves 550 families
- Supported by the Xavier University Sustainable Sanitation Center



1. Collection (UDDTs)



2. Maturation of Lactic Acid Fermentation Process



3. Vermicomposting

Terra Preta Sanitation Facts

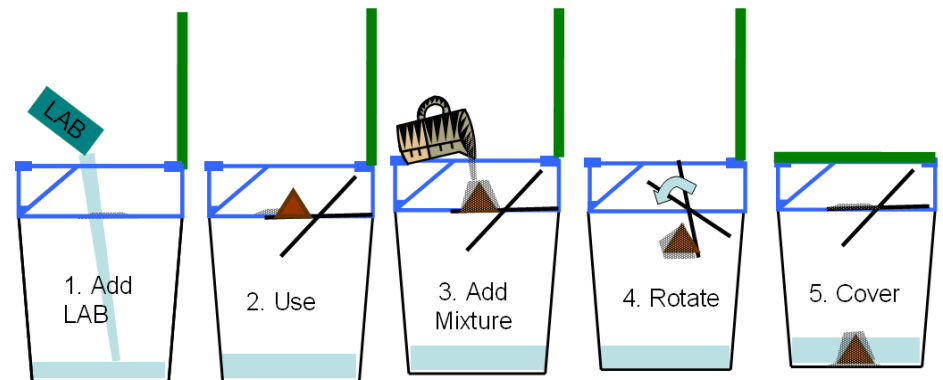
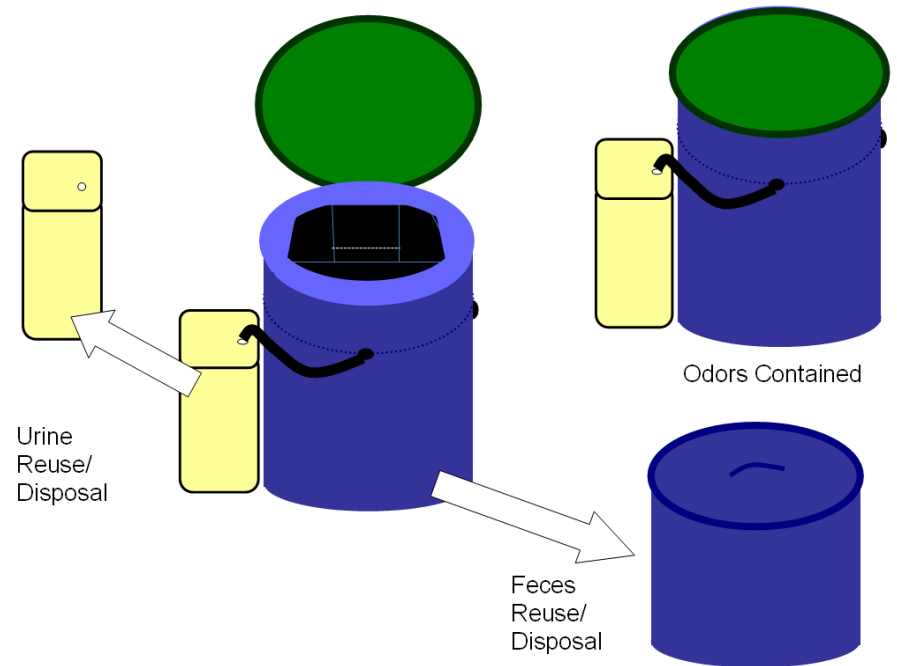
- Cost of Infrastructure, Philippines
 - Toilet, serving one household = \$87
 - Storage facility, 20-30 households = \$75
 - Vermicomposting facility, 100 households = \$500
 - **Total: \$95/household**
- Time of Construction
 - All structures need 2-3 months with 2 workers.
 - UDDTs build with two workers in one day
- Hygienization
- **Zero** Ascaris eggs after lactic acid fermentation process
 - Ascaris eggs were found after vermicomposting of dehydrated feces (6 months) from UDDT

Designing a Future Application of Ecosan

- Needs:
 1. Portability and increased speed of response
 2. Increased coverage, privacy and safety
 - Especially for women and children and night-time toilet use
 3. Vector reduction
- Desires:
 1. Decreased cost
 2. Facilitation of reuse of the excreta

Portable TPS Design: Porta Preta

- Meets following needs:
 1. Rapidly deployable
 - 36 units on a pallet
 2. Privacy- used inside the home
 - Minimizes odor
 3. Vector Reduction
- Cost effective
 - \$1.30-\$1.80 /person/month
- Produces a rich soil enhancer



Thanks for your attention!

Questions?

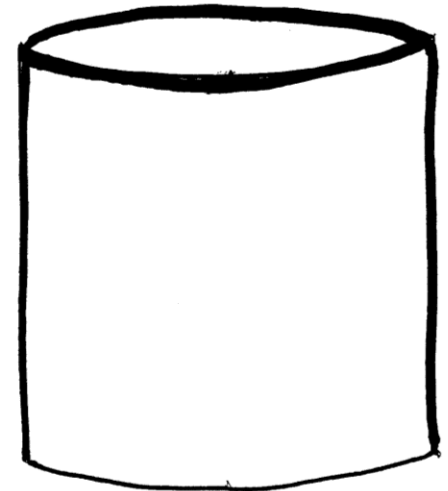
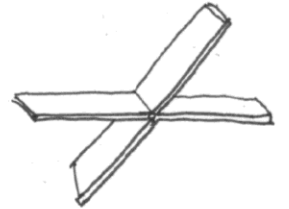
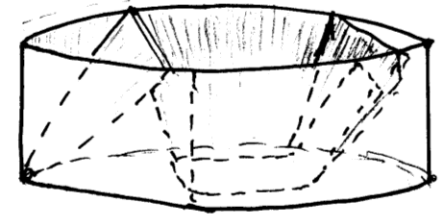
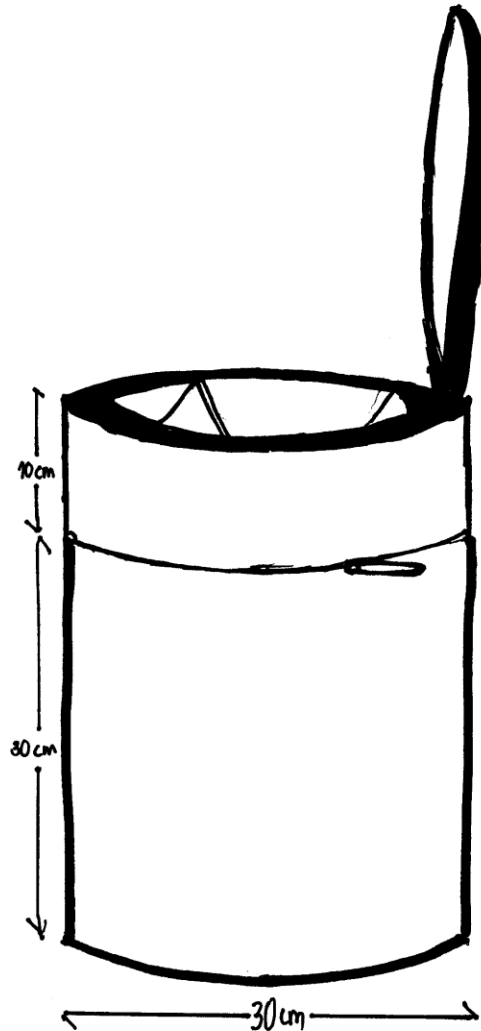
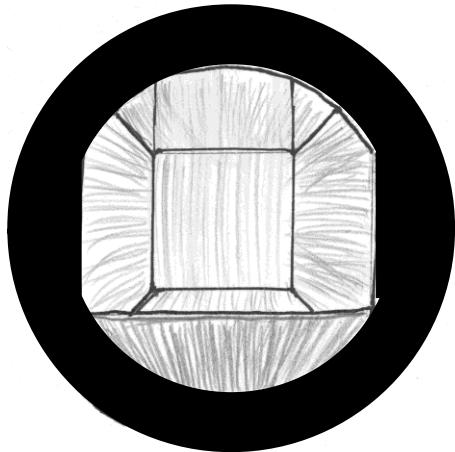
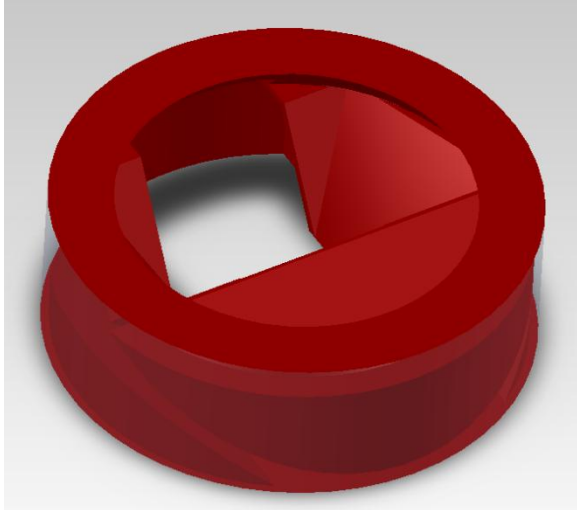
References

1. *UD Toilets and Composting Toilets in Emergency Settings*. Issue brief no. TBN 7. OXFAM, 2009. Print.
2. "Urine Diversion Dehydration Toilets after Typhoon Sendong in the Philippines." *Sustainable Sanitation in Emergency & Reconstruction*. Web. <<http://susana.org8.wordpress.com/>>.
3. Delepière, A. (2011). Household UDDTs after cyclone disaster, Padma and Rohitra villages, Barishal Division, Bangladesh - Case study of sustainable sanitation projects. Sustainable Sanitation Alliance (SuSanA).
4. Patinet, J. (2010). Household pit latrines with urine diversion in the Farchana refugee camp in eastern Chad - Draft. Case study of sustainable sanitation projects. Sustainable Sanitation Alliance (SuSanA) and Groupe URD, France.
5. Richard Higgins. "Sainte Marie Pilot Project: For the safe remediation of human waste and its transformation into an optimum fertilizer by Howard Higgins (TNR) EcoSan, thermophilic composting." New Horizons Foundation. May, 2010.
6. "Compost Toilets in Christchurch." *Compost Toilets*. Web. 24 Mar. 2012. <<http://www.composttoilets.co.nz/>>.
7. Factura, Horacio. "TPS in Xavier Ecoville." Message to the author. 9 May 2012. E-mail.

Additional Slides

Additional Slides Concerning the Porta Preta

Porta Preta Sketches



Costs per Porta Preta (Serves 5)

Fixed Costs

Porta Preta Unit	\$25
Logistics (delivery)	\$10
Labor (distribution and user training)	\$0.60
Processing Equipment Cost	\$2.00
Urine Soakaway patch	\$20

Total: \$57

Monthly Costs

Consumables	\$3.50
Collection and Processing	\$0.50

Total: \$4/month

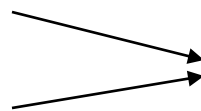
\$1.30-\$1.80
per person
per month

(when used for
12 months)

Consumables

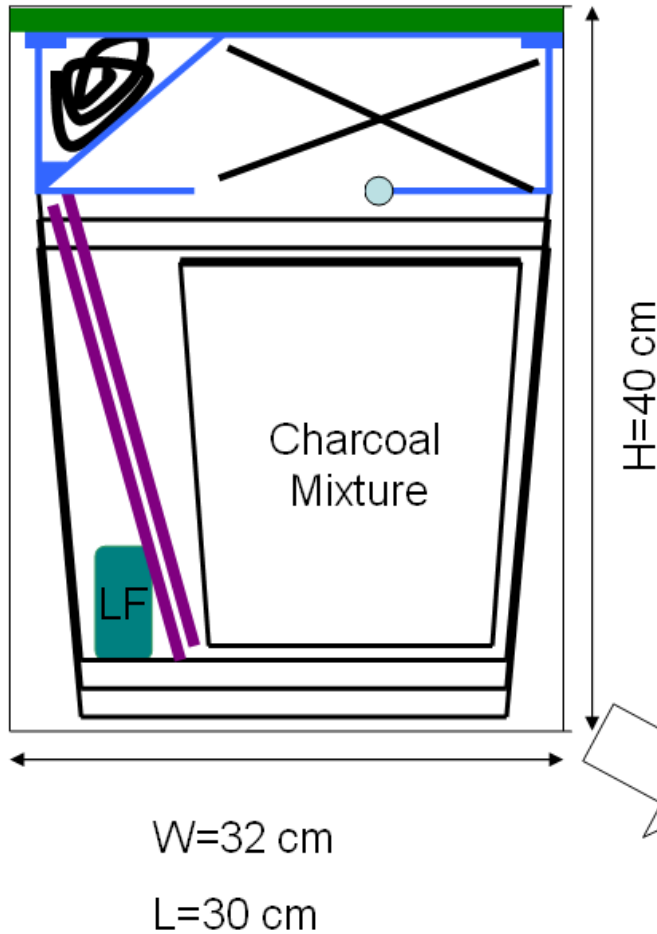
1 kg charcoal/person/month

0.25 kg sugar/person/month

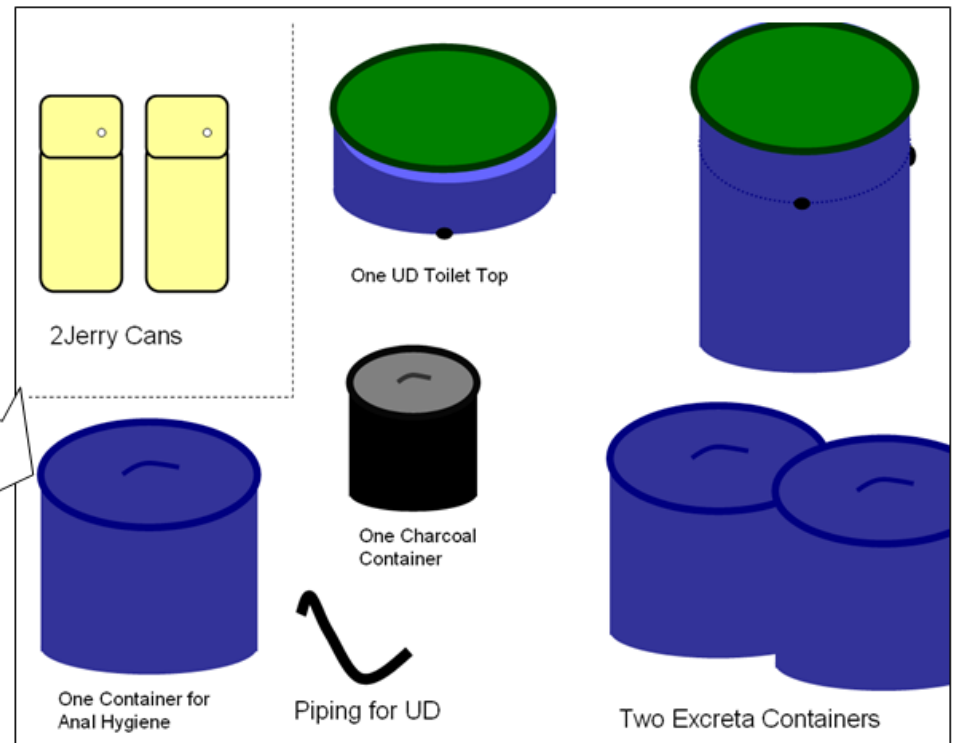


\$0.75/person/month

Compact Shipping Design



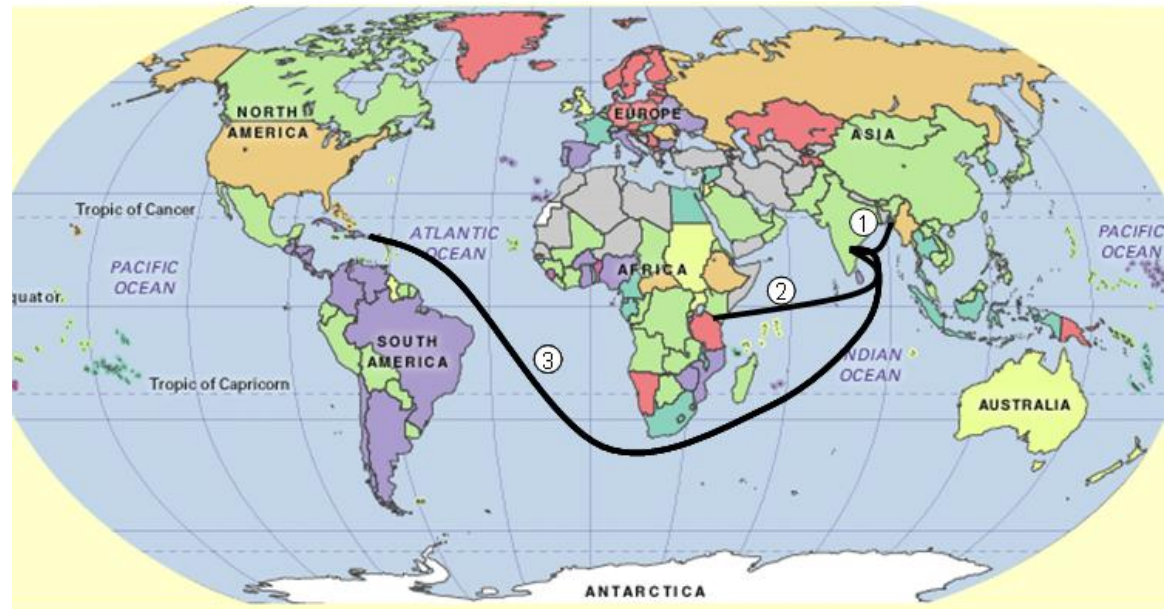
Cost of unit: \$25



Cost of Delivery

Logistics Analysis

1. India-Bangladesh \$7
2. India-Kenya \$9
3. India-Haiti \$10



Integrated Sanitation Concept

