

Septage Treatment:
Terra Preta
Use of indigenous technology
Jan Spit



Existing conditions: overflowing cesspits



Existing conditions: no treatment

Sewage transfer stations



Haphazard dumping



In 1541 Francisco de Orellana was looking for gold but found.... Black Earth (Terra Preta)



Smart guys those Amazon Indians!



15/6/12

from: Günther F. (2007). Carbon sequestration for everybody

Ingredients: Faecal Sludge /Charcoal-stone dust/Lactic acid bacteria

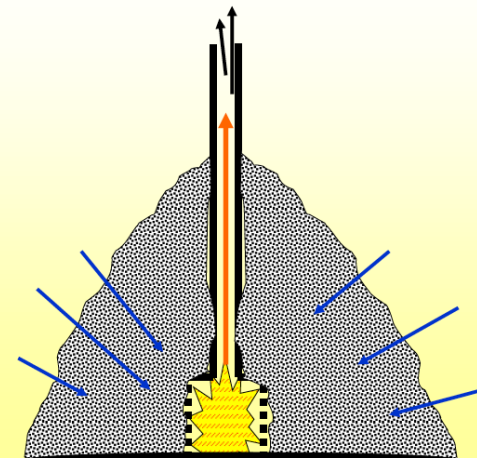


Charcoal production: pyrolysis of kitchen refuse, woodchips, rice husks

Kuntan (Japan)
carbonised rice
husks



Charcoal Production -Vulcano



Lactic acid bacteria production

- Purchase EM, or
- Do-it-yourself:
 - 1 litre water
 - 1 kg molasses
 - 150 ml Yakult
 - 7 days fermentation
 - 1:200 dilution



Step 1

- Mix sludge with charcoal → no odour!
- Stone dust
- Limestone
- Facultative: wood chips / garden refuse



Step 2: Lacto Acid Fermentation

- Add Effective Micro-organisms or Lactic Acid for Lactic Acid fermentation (similar to silage):
 - Anaerobic process (but aero tolerant)
 - No gas, no loss CO₂ and nutrients
 - No odours
 - High acidity → pathogens are killed



Step 3: (Facultative for extra good soil) Vermicomposting



**Breakthrough in solids treatment at TUHH
(BMBF / IPSWaT)**

Pro's & Con's

Pro's

- 100% Local materials → no import
- Can be done manually / standard equipment
- < 3 weeks: pathogen free, very efficient
- No odour, no noise, no vector breeding
- Nutrient recovery, Perfect soil improvements, no 'waste'
- Step-by-step (modular approach) possible
- Low cost

Con's

- Conceptual phase, no field experiences yet
- Need some time for charcoal & lacto acid bacteria
- Works better with separation of urine / faeces

Conclusions:

- High score Specs
- Future:
 - Very promising technology!
 - Needs to be sorted out

Let's jump in the Terra Preta!

Jan Spit



Afterthought

Refer presentation 1st day

Katherine TUH

Bucket system

- E.g. www.triaterra.de (see life example)
- Mobile-toilet with a closing lid for the bucket
- After usage: cover with ½ cup of a mixture of 2,5 kg ground charcoal, 1 kg dolomite-lime, 1:100 EM; or
- Leachate of lacto-acid-fermented sauerkraut (pickled) & stone flour
- Operation ok if smell is ok, leave min. 3 weeks fermentation

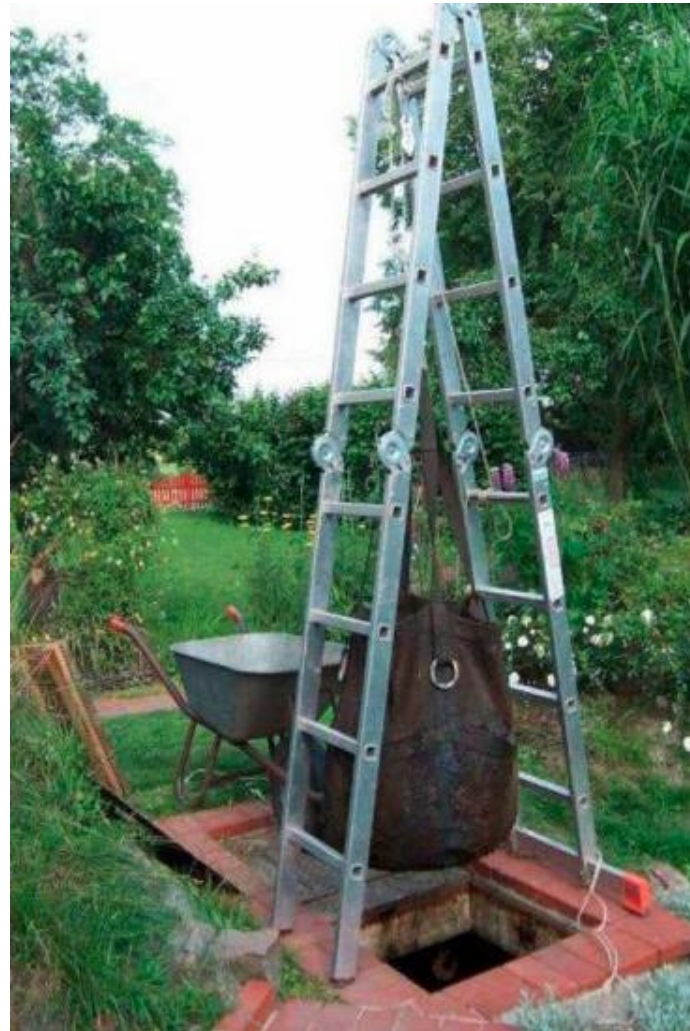
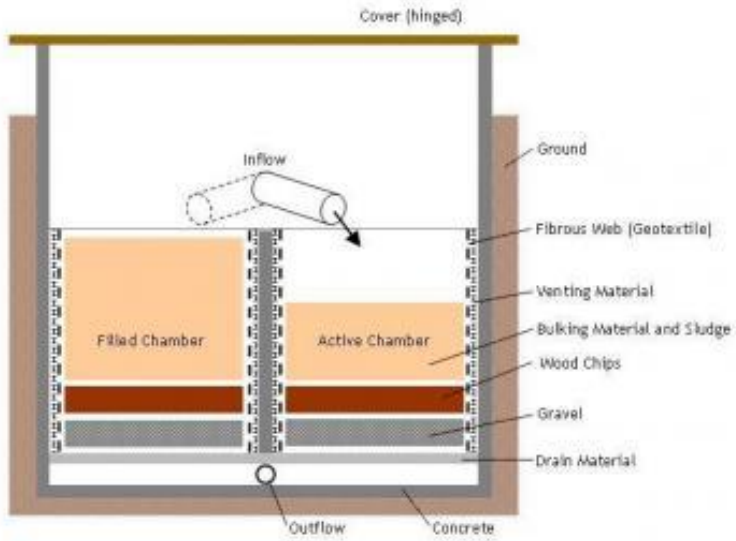
Bucket system also for flooded areas



Adapted EcoSan



Rottebehaelter



From: Otterpohl

Adapted Rottebehaelter

**Rottebehaelter /
Pre-composting tank**
2 filter bags used
for 6 month alternatingly
then vermicomposting
with bio waste and
woodchips (optional)

**Lacto-acid bacteria
are added**



**From Dr. Haiko
Pieplow,
Ministry of the
Environment,
Germany**

15/6/12

Rottebehaelter

