

Sanitation and Disaster Scenarios



One piece of feces can contain up to 1,000,000,000,000 viruses

One gram of feces contains ca. 10,000,000 bacteria

Organic Matter 88 – 97%
Moisture Content 66 – 80%



Nitrogen 5-7%
Phosphorus 3 – 5.4%
Potassium 1-2.5%
Carbon 40-55%
Calcium 4-5%

More than 140 types of viruses can be passed through human feces.

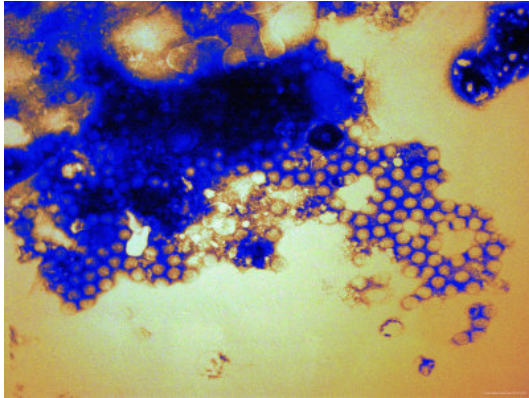
Including polioviruses, coxsackieviruses (causing meningitis and myocarditis), echoviruses (causing meningitis and enteritis), reovirus (causing enteritis), adenovirus (causing respiratory illness), infectious hepatitis (causing jaundice), and others.



Health

Environment

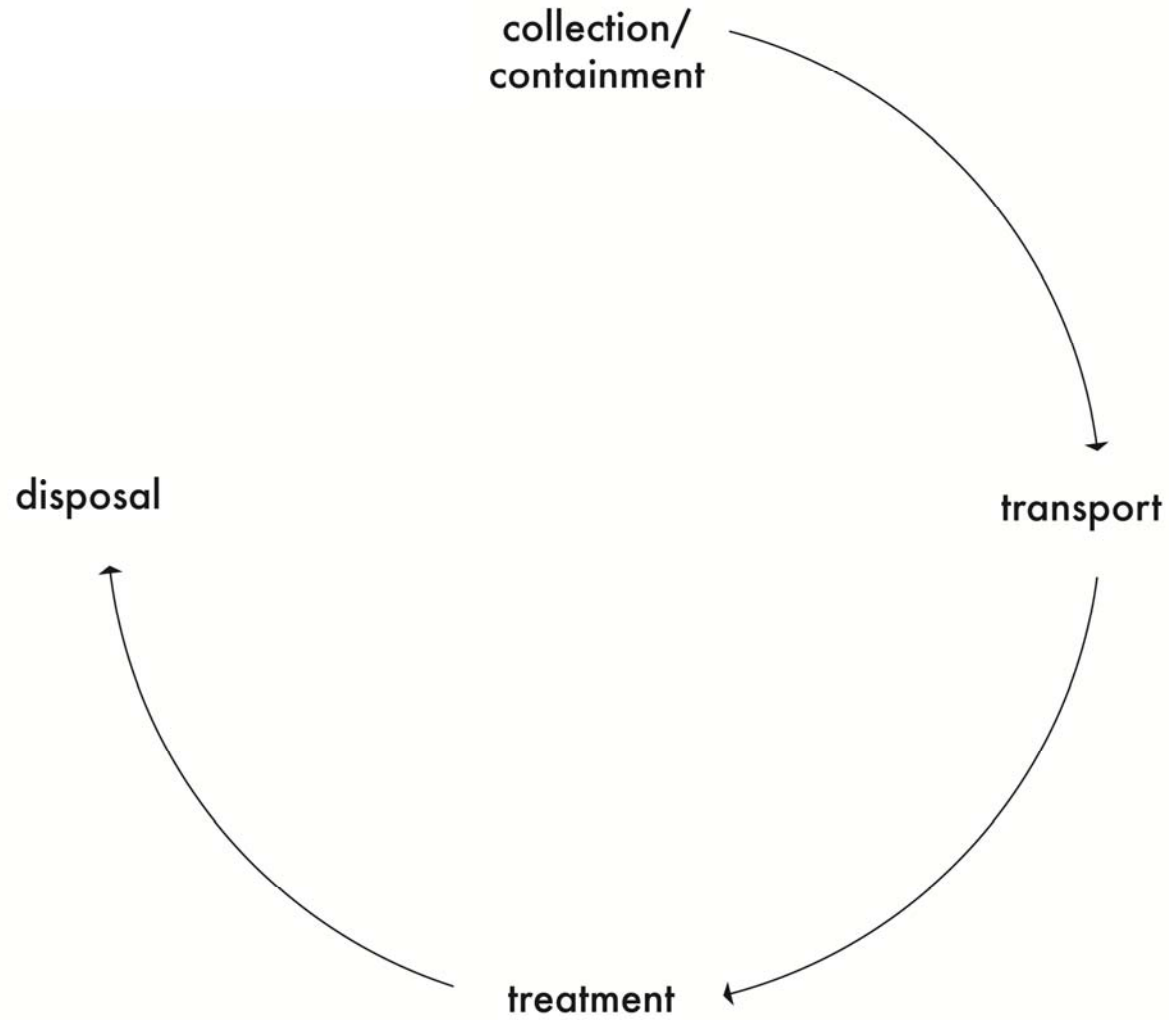
Culture



„Sanitation has saved more lives than anything else in history – more important than vaccines, antibiotics, and anaesthesia.“ – *British Med Journal*

In 2001, of the 2445 beaches surveyed by the Environmental Protection Agency, 672 were affected by advisories or closings, most often due to elevated bacteria levels.

The „one-way“ System

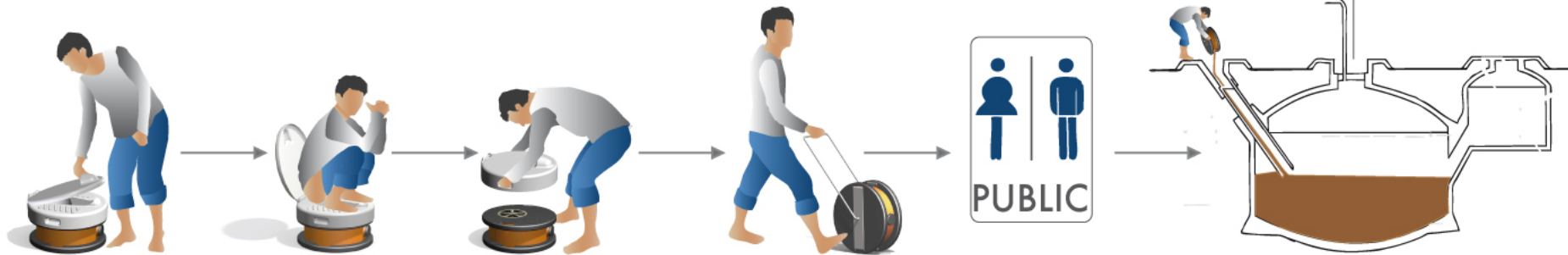


**Pathogens are not killed in water.
They are just transferred.**



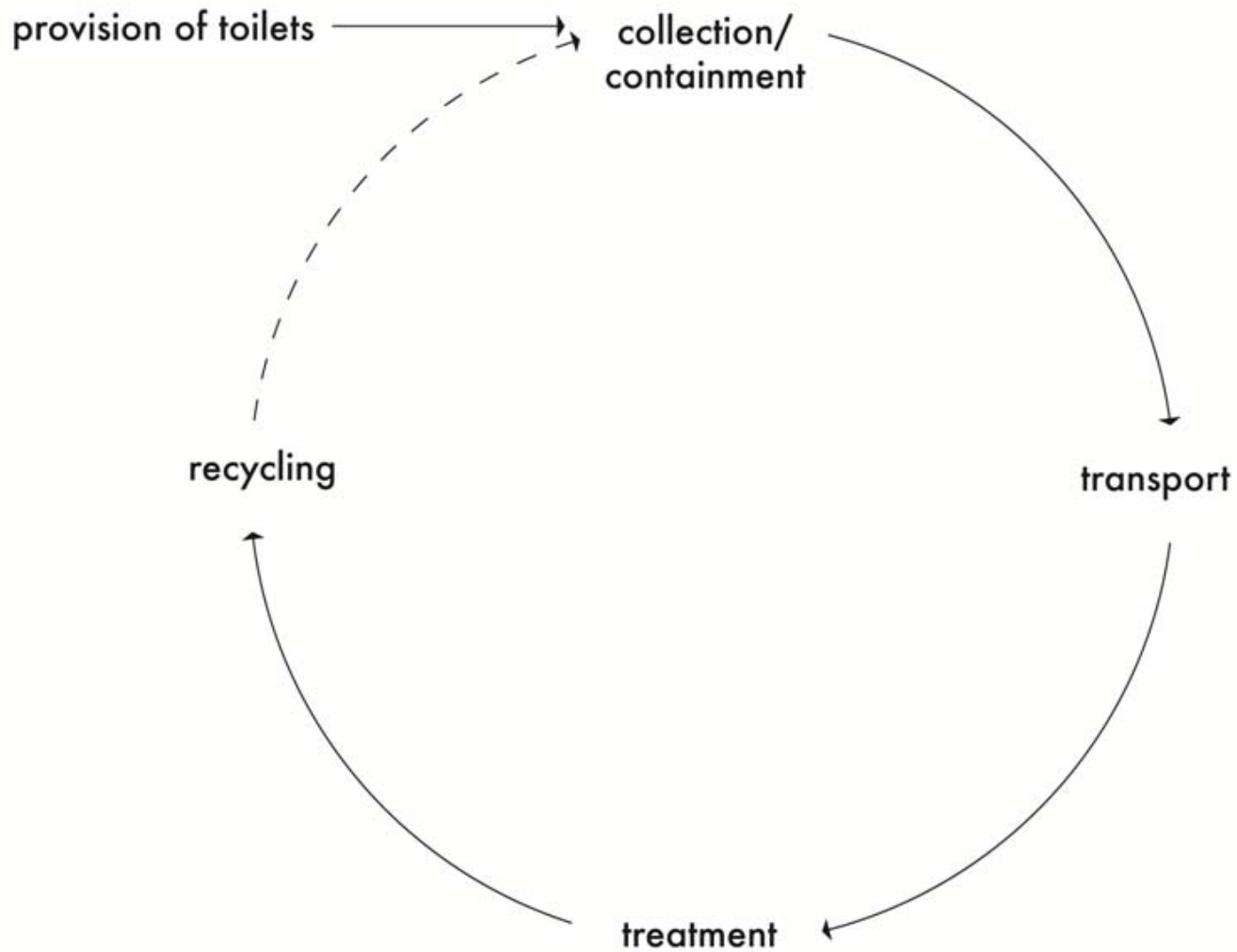
X-runner

- Slums – no sewage system
- Private homes
- Small crowded spaces
- Limited access to water
- Low-income users



- Culturally adapted (squatting, rolling, no splashing)
- Use with small amount of water
- No additions needed
- Energy/Fertilizer in return

The Sanitation Circle



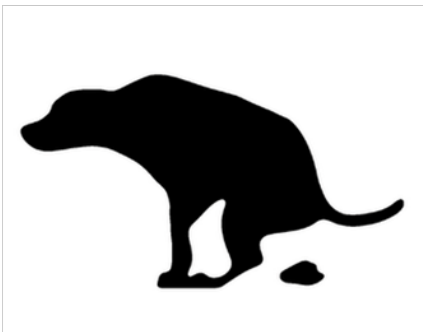


What could be quick, clean, and more flexible alternatives for post-disaster scenarios?

Instant Solutions

Diseases spread faster than education in an emergency situation

Learn from your dog

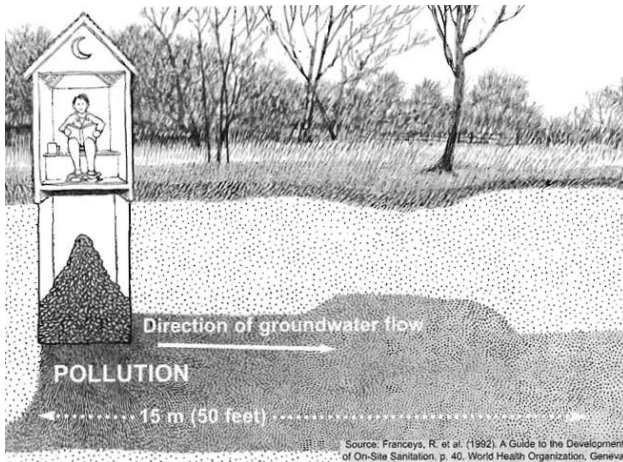
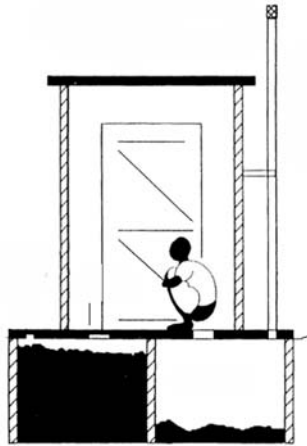


> basic sanitation education is key

Prepare Peepoo



Common Temporary Solutions





Temporary Solutions Alternative

Compost Toilet

- Odor and insects free
- Feces and urine are composted
- Thermophilic microorganisms kill pathogens
- Feces are recycled to high quality fertilizer

Requirements

- Pile of compost
- Local organic cover material
- Container

The Compost Toilet

In May, 2010, a group of people from America, Australia, Portugal and Haiti, joined together with GiveLove.org and SOIL (OurSoil.org) to create an alternative sanitation system for earthquake ravaged Haiti based on "hot" composting.

Rules for Maintenance

Toilets should be shared by small groups

Toilets should not smell bad

Toilet users should be educated about the recycling of their feces,
before the disaster occurs

Provision of Toilets

- Easy to transport by truck, ship, etc.

or improvised toilet

- Stackable/foldable
- Lightweight
- Easy to store

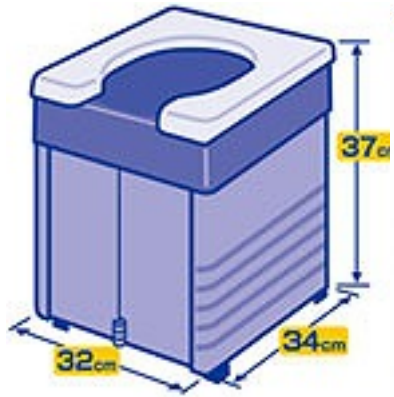
Transport

- Mobile!
- To be handles by individual
- Ergonomic
- No spilling

Collection

- Clean/hands-free
- Intuitive to use
- Smell free
- Easy and safe to remove organic matter
- Not close to any water source

Existing Solutions



セット内容 1回に凝固剤を1個使用。凝固剤5回分セット



Ergonomic Solutions



Thankyou!

