

# MonEcoSan

## Test Sanitation District Proposal



**A model for dignified, sustainable sanitation  
in ger districts of Ulaan Baatar**

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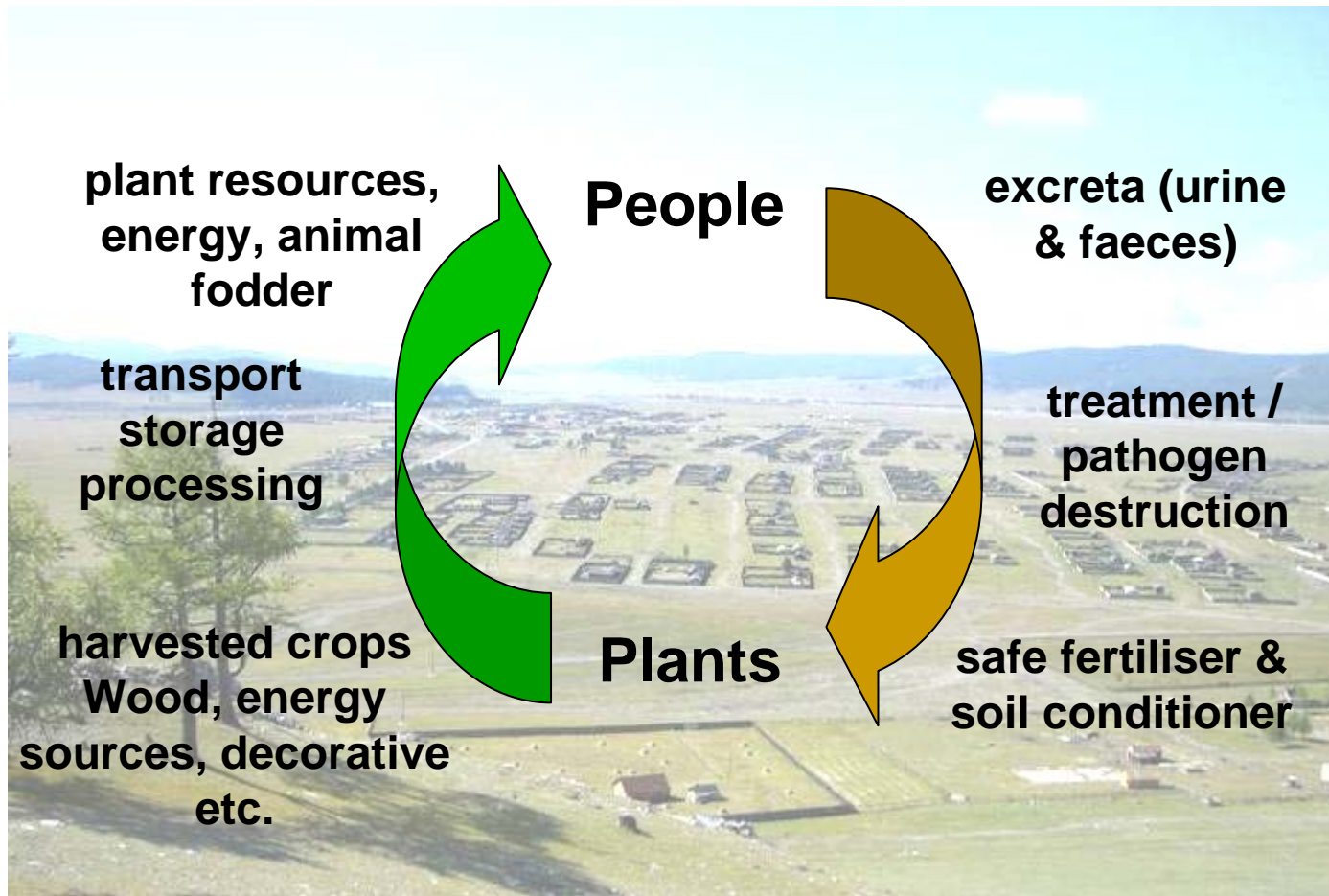
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# What is ecological sanitation?



**Not a technology, but an approach!**

# The Problem



- Pit toilets stink, breed flies, are uncomfortable to use, undignified, damage property values, pollute groundwater, spread disease.
- Sewer expansion too expensive/disruptive
- Not everyone wants to “compost” their own waste.
- Unsolvable, unpleasant sanitation reinforces poverty
- Individual solutions pursued instead of community solutions

Open trench, Ulaanbaatar

# Central Sewerage



- **Expensive:** largest amount spent on piping / maintenance
- **Ineffective:** 90% discharged untreated into rivers
- **Water intensive:** to flush waste through the pipes
- **Adaptability:** Not suitable for very cold climates
- **Not sustainable:** nutrients, water are wasted, high energy input

# MonEcoSan Principles:



- **Separate:** specialized, simple toilet seat separates urine and faeces
- **Collect:** specialized containers collect and store urine and faeces in toilet building
- **Transport:** private business or government service collects full containers just like garbage is collected with trucks, trained workers.
- **Process:** Compost under scientific, controlled conditions or dry and incinerate
- **Reuse:** Compost and urine as soil amendments and fertilizer for agriculture

# MonEcoSan Collection and Reuse



- Like garbage, waste containers collected and emptied by private industry with trucks
- Specialized containers facilitate collection and insure hygienic handling
- Creates new jobs
- Central location for large scale processing
- Compost produced for growing non-food items
- Urine can be direct fertilizer on steppe forest
- Urine can be “mined” for dry fertilizer for edible produce

# Gandan Test Sanitation District



- 50 households next to Gandan Monastery, a ger district with chronic sanitation problems but high property value because of location
- Two year long project
- Households selected by Gandan monks.
- MonEcoSan training, project implementation and monitoring by monks from Gandan Monastery emphasizing Buddhist responsibility for environment and community
- Standard MonEcoSan toilets provided through micro-mortgages
- Processing and reuse methods developed with Mongolian State University of Agriculture (Bor Nuur Station)
- Collection business developed in private/public sector
- Small, closely monitored test group to allow for adjustments and innovations to “prove” viability of MonEcoSan
- Households that fail to maintain, operate toilets correctly lose toilet and forfeit deposit.
- Authority and legacy of Buddhism critical to creating genuinely Mongolia solution.

# Why MonEcoSan?



- No odour or flies, hygienic, comfortable
- Build anywhere, no hole in ground
- Simple design for home maintenance
- No water required
- No groundwater / environmental contamination
- Urine and faeces separated – easier to handle
- Many options for compost/reuse
- Protects property values
- Community based solution based on science and cultural conservation values



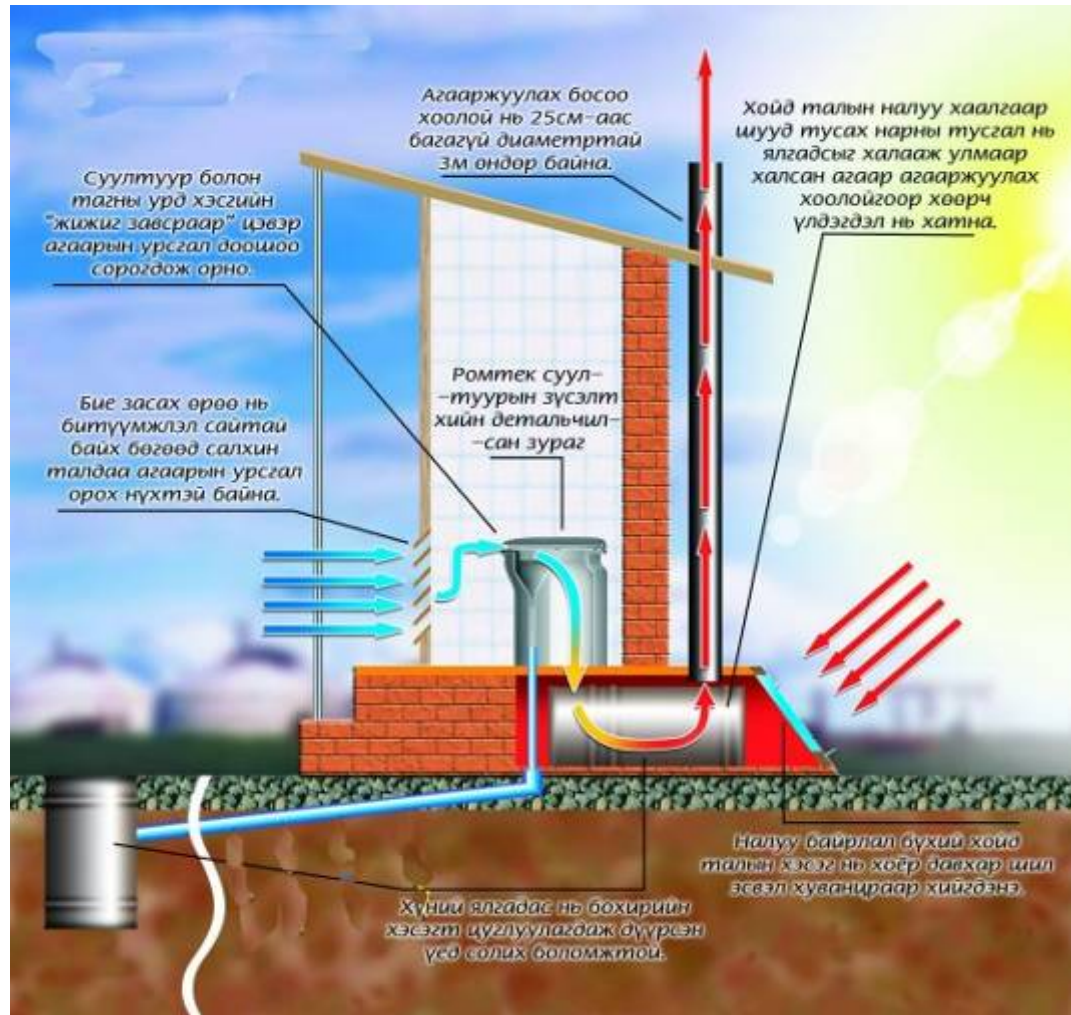
## Ecosan technology adapted for Cold Climates

- Removable containers
- Container collection like garbage is collected
- No pipes (winter freezing)
- Improved ventilation and aeration
- Sealable wind flow



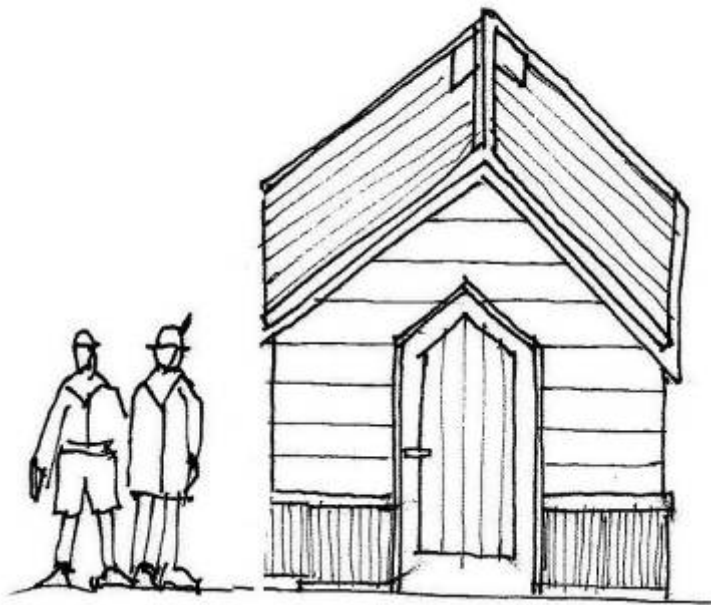
Large chimney with additional plexiglass insulation

# MonEcoSan: Urine Diversion Cross Section



In the MonEcoSan version, the toilet has two pans where the faeces are collected. When one is nearly full, it is swapped with empty so that drying continues until the second pan is full. Testing will show the optimum interval for emptying containers.

# MonEcoSan Toilet: Layout



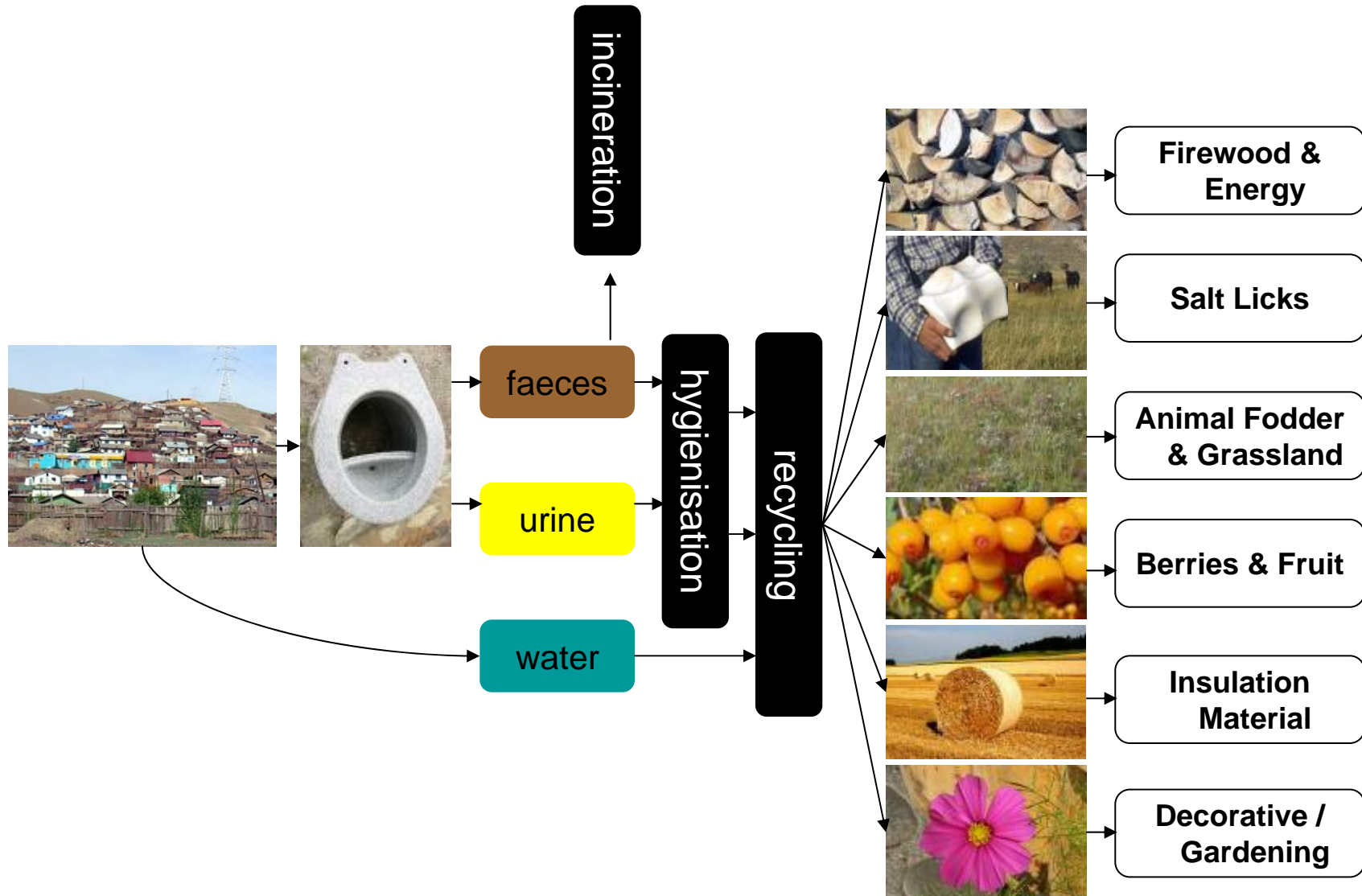
Unique roof helps ventilation, ground level access to containers, steps INSIDE toilet, toilet large enough for toilet, urinal and handwash (greywater sand filter outside), comfortable dimensions. Toilet can be customized with siding, paint or other personal touches. Transportable and a tangible asset with resale value.

# MonEcoSan Winter: Pee Cubes



- Solution for winter operations
- Tough, flexible plastic buckets, tapered at the bottom, allow urine to freeze and be released as “pee cube” for collection or storage

# MonEcoSan: Reuse Options



# Urine as Direct Fertilizer



Barley, fertilized with different amounts of urine



...it works!



Oats, fertilized with different amounts of urine



Seedlings after one week without water



# MonEcoSan Examples: Khatgal



**Toilet - inside**



**Separation Seat**



**Adding ash to speed up  
drying process /  
hygienisation**

# MonEcoSan Examples: Khatgal



**Front view, with separate urinal on the right side. Two toilets for men / women. Model for tourist camp.**



**Back view, with collection chambers for urine and faeces, and large chimneys for aeration. The back faces south, so that it gets the most sun possible**

# MonEcoSan Examples: Khatgal

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# MonEcoSan Examples: Khatgal



Would you relax on the steps of typical ger horoloo jorlun?

# MonEcoSan: Erdenezuu Khiid



**Toilet, inside (model for  
tourists and visitors)**



**Separate Urinal**

# MonEcoSan Examples: Erdenezuu Khiid



**Toilet at Erdenezuu Khid, combined with separate Urinal**

# MonEcoSan Examples: Boornuur



**Toilet at Boornuur Agricultural research station (basic model)**



**Back side, with space for faeces and urine collection container**

# MonEcoSan Examples: Boornuur

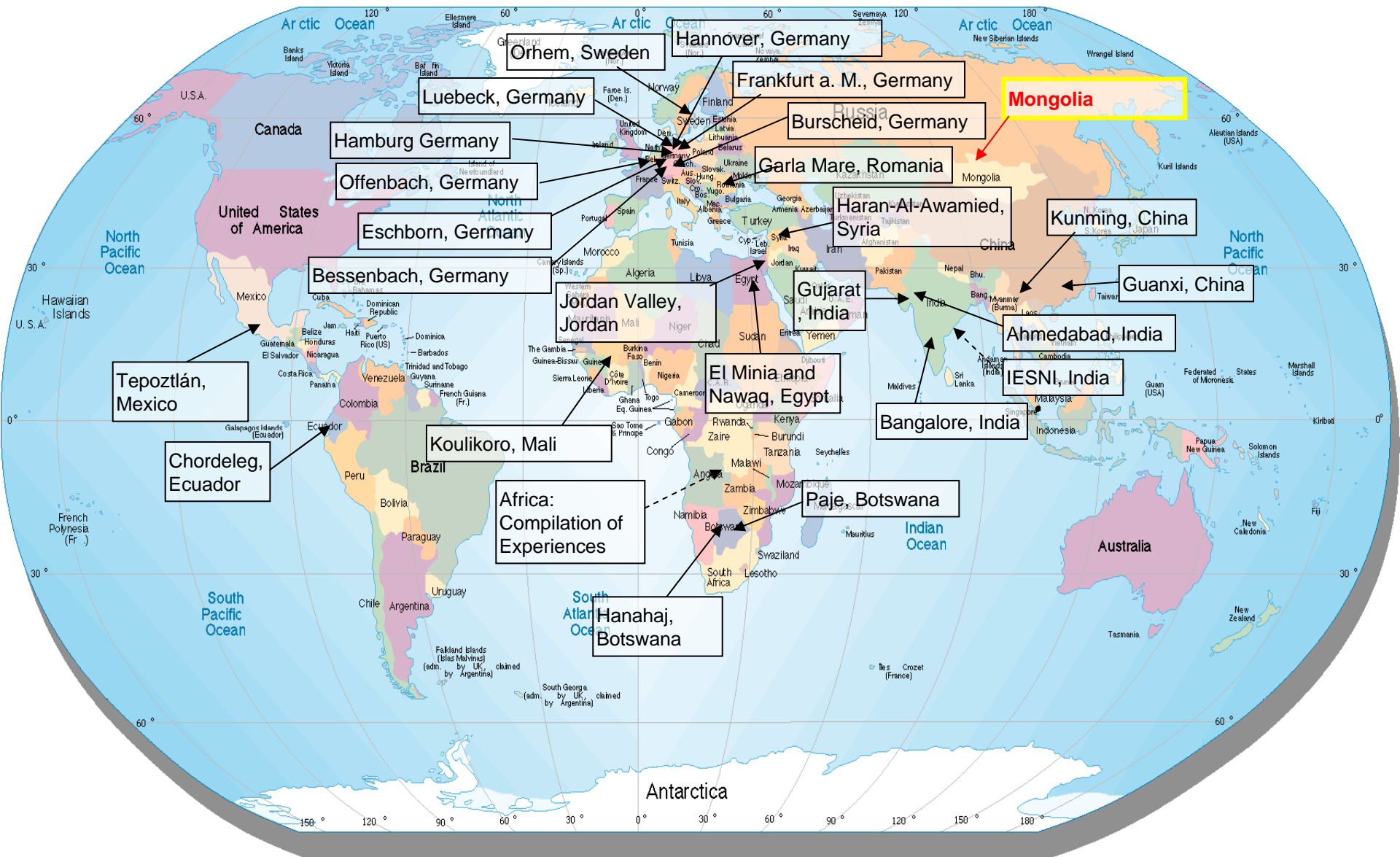


**Toilet, inside at Boornuur  
Agricultural research station  
(basic model)**



**Option (off-the-shelf) for faeces  
collection, with good aeration**

# Ecosan Projects all over the World



# Contact



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