WC CUBICLE
IDPS 2013

EcoPan

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Research
Design a bathroom cubicle for India, containing a toilet or squatting pan, as well as the most adequate solution for waste and water handling.

GOALS
- New needs
- Ergonomics
- Cleaneability
- Product interface
- Product architecture

EcoDesign
The Cubicle

25 persons/day  25 persons/day
Sub-products

Solid waste
Biogas and fertilizer

Urine Fertilizer

Bio-digester Fixed-Dome plant

Urine contains most (94%) of the NPK nutrients excreted by the human body

Biogás: for cooking or lighting

Excellent fertilizer for frayed lands of India.

Uses a natural system

Sterile
Fixed Dome Type biogas plant

<table>
<thead>
<tr>
<th>Plant Description</th>
<th>Average daily feedstock (kg)</th>
<th>Daily water (L)</th>
<th>Plant size (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Wc Cubicles</td>
<td>32</td>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>3 Wc Cubicles</td>
<td>48</td>
<td>48</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>luci</td>
<td>Luciana Pedrosa;</td>
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</tbody>
</table>
Squatting Pan
**System**

**Squatting pan**
New innovative feature moves down to drive trap system

**Floor**
Slopes towards draining system to facilitate cleaning

**Urine storage**
Fixed tanks with faucet for easy emptying

**Trap system**
Always provides barrier against odours and insects

**Solid waste collection**
Directly connected to the biodigester

EcoPan
Mechanism ideas

1. NOT IN USE  
2. STEPPING ON THE PAN  
3. IN USE

1. NOT IN USE  
2. STEPPING ON THE PAN  
3. IN USE

1. NOT IN USE  
2. STEPPING ON THE PAN  
3. IN USE
Trap system

1. Not in use

2. Stepping on the squatting pan

3. In use

4. Leaving the squatting pan
Urine

Urine storage
Fixed tanks with faucet for easy emptying
Cleaning

Floor and draining
Slopes towards draining system to facilitate cleaning
Additional Elements

Handlebar:

Rain Capture:
## EcoPan vs Other products

<table>
<thead>
<tr>
<th></th>
<th>BIOLET</th>
<th>Enviro Loo</th>
<th>EcoPan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less water, and is recycled</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Reuse solid waste</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Reuse Urine</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>No requirement of electricity</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Easy to understand how to use</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Big capacity of users</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Unique flap mechanism</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
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</tbody>
</table>
SWOT Analysis

**Strengths**
- 1 cubicle with 2 rooms: one for men and one for women
- Facilities can be self-provided
- Electricity not required
- Same squatting pan for women and men
- Low use of water
- Reuse of the washing water to the bio-digester
- Cleanability: Drain system

**Weakness**
- Elevate cost of bio-digester construction
- Limited background
- Complexity of the mechanism
- Short experience in the sector

**Opportunities**
- User Center Design criteria
- Human rights: sanitation
- Roca is one of the leading companies in the sector
- Sustainability criteria

**Threats**
- ISO’s and regulation
- Hard odours
- Difficulty to find a universal solution for everything (genders, religions and cultures)
- Difficulty to treat the waste
- Correct use of the product
- Responsibility of human lives
Thanks!

Questions?