International experiences: project examples

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### Basic types of ecosan-projects

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<th>Project-type</th>
<th>Characteristics</th>
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<td>rural upgrading</td>
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<tr>
<td>B</td>
<td>urban upgrading</td>
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<td>C</td>
<td>new urban development areas</td>
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<td>D</td>
<td>particular objects (tourism, schools ..)</td>
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</table>
Experimental on-site sanitation in Koulikoro, Mali (supported by GTZ)

experimental on-site sanitation module consisting of a urine diverting dehydrating latrine, shower and greywater garden

Greywater garden

Urine diverting concrete slab

Source: GTZ
Ecosan-study and reuse experiments in Havana, Cuba (supported by GTZ)

- Study of options for reuse of urine and faeces in existing urban agriculture in Havana

improved soil quality through reuse of organics
International experiences:

**Project examples**

- **Ecological Sanitation Symposium, Syria, 11-13 December 2005**
  - **Constructed wetland Haran-Al-Awamied, Syria (supported by GTZ)**

  **Wastewater treatment with constructed wetland system:**
  - Wastewater treatment through reed beds
  - Sludge treatment through reed beds
  - Treated wastewater used for irrigation purpose
  - High efficiency for hygienization
  - Small surface required: 0.5m² per capital
  - Low cost: 13.7 euro/person (construction), 1 euro per person every year (running cost)

Source: Mohamed
Ecosan public toilet centre Bangalore, India
(supported by ACTS, SDC, Uni Oslo and GTZ)

- Public toilet: separate collection of urine, faeces and anal cleaning water
- Separately collected and stored urine used as fertilizer for banana plantation
- Faeces transported by truck and treated in a biogas plant

Source: Johannes Heeb
International experiences:

project examples

Ecological Sanitation Symposium, Syria, 11 - 13 December 2005

Ecosan public toilet centre Bangalore, India
(supported by ACTS, SDC, Uni Oslo and GTZ)

Biogas plant

Biogas used for cooking

Source: GTZ
Biogas program Dhapasi, Nepal

- Biogas is used for cooking.
- Organic sludge is used to fertilise the garden.
- Toilet wastewater and manure are used in a household biogas plant.
International experiences: project examples

**Egypt (supported by GTZ)**

- large scale field test on soilisation of sewage sludge using vegetation (IPP Consult)

Soilisation bed with grass
China-Sweden Erdos Eco-Town Project, China (supported by SIDA)

- Ecosan practises in an entire functioning modern town:
  - Urine-diverting dry toilets and collection systems for multi-storey buildings
  - Greywater collection and treated in decentralised system
  - Composted faeces and urine reused in agriculture
China-Sweden Erdos Eco-Town Project, China (supported by SIDA)

Ecological Sanitation Symposium, Syria, 11-13 December 2005
Four-in-one model, China

animal – toilet – biogas – vegetable

- combined with Greenhouse Production
- more than 1,000,000 times in peri-urban areas of Megacities in Northern China
- Use of nutrients, organics, energy and carbon dioxyde
Urine diverting dry toilet in Guangxi-Provence, China (supported by SIDA and Unicef)

- Large ecosan project in the phase of up-scaling
  - 1997, pilot project funded by SIDA/Unicef, 70 ecosan (urine diverting dehydration toilets) built in pilot village, Dalu Village
  - 1998, 10.000 urine-diverting toilets were built in 200 ecosan villages in Guangxi
  - 2002, 100.000 ecosan toilets in Guangxi
  - 2003, 685.000 ecosan toilets in 17 provinces (Ministry of Public Health)

- Factors of success: cultural acceptance, political commitment, technical flexibility, low cost, income generation, pressure from water pollution and water scarcity, promotion and marketing
Urine diverting dry toilet in Guangxi-Province, China (supported by SIDA and Unicef)

source: Sandec
Decentralized treatment for municipal sewerage, China

DEWATS / LOMWATS
Decentralized wastewater treatment systems
Low maintenance wastewater treatment systems

Biogas Digestors
By 2002: 115,176 plants
Data: Ministry of Agriculture

Baffled septic tank
Source: BORDA
KfW office building, Frankfurt, Germany

ecosan concept since 2003:
- Greywater recycling
- Rainwater harvesting
- Vacuum wastewater collection
Eco-settlement Lübeck – Flintenbreite, Germany

Eco-settlement for 350 people

- Greywater treatment in constructed wetlands
- Storm water infiltration in swales
- Vacuum toilet
- Biowaste shredder
- Transport of blackwater and biowaste
- Central technical building
- Vacuum pipe

Source: Otterwasser GmbH, Germany
Eco-settlement Lübeck – Flintenbreite, Germany

- apartments with greywater treatment and constructed wetlands
  - vacuum station, sanitization tank and biogas treatment plant for the collection and treatment of diluted blackwater

Source: Otterwasser GmbH
Greywater recycle in Hotel Arabella, Germany

- Greywater from baths and showers in guest rooms treated with rotating biological contactors and reused for toilet flushing
- Rainwater collection for irrigation of hotel garden
Main building of GTZ headquarter, Germany

Ecological Sanitation Symposium, Syria, 11-13 December 2005

ecosan concept: separation, processing and agricultural reuse of urine (implementation 2004/2005)

urine diversion toilets and waterless urinals
International experiences:

project examples

Ecological Sanitation Symposium, Syria, 11-13 December 2005

Main building of GTZ headquarter, Germany

Source: GTZ
Thank you!

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