Ecological Sanitation in the Urban Context : Emerging Opportunity

Patna 25th May 2012

Three Main Causes of impending water scarcity

1. **Rapid urban growth approx. 170,000 increase per day in developing countries**

-by 2025 4 times more urban dwellers in developing countries than developed
-93% of urban growth from 1995-2025 will be in developing countries
-by 2015 only Tokyo remain in 10 most populous cities from industrialized nation
-water demand has sunk the ground water to the alarming level

2. **50 % of all potable water is wasted or lost**

-Leakage in pipes
-Treated water used for another purpose like gardening, car wash etc.
-High water consuming fixtures in Toilet
-Using old conventional system which requires lot of water

3. **Pollution to water bodies is the main contributor for escalating urban water crisis**

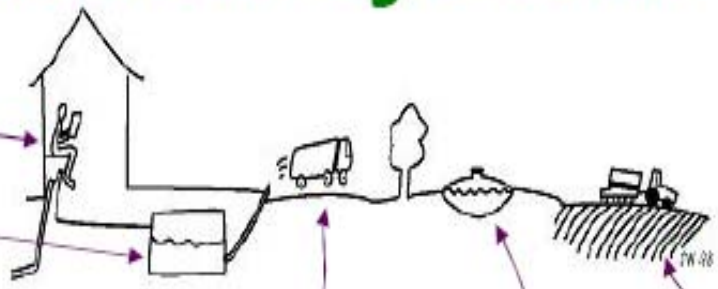
-2 million Ton of human excrement and ever increasing volume of untreated discharge from industry going into urban water bodies
-Intrusion of salt water into the aquifer will be a reality soon in many coastal cities
-Only 5 % of industrial and domestic waste receiving treatment
-Untreated discharge contaminates the fresh water resources and makes it unusable

Solution to avoid water scarcity

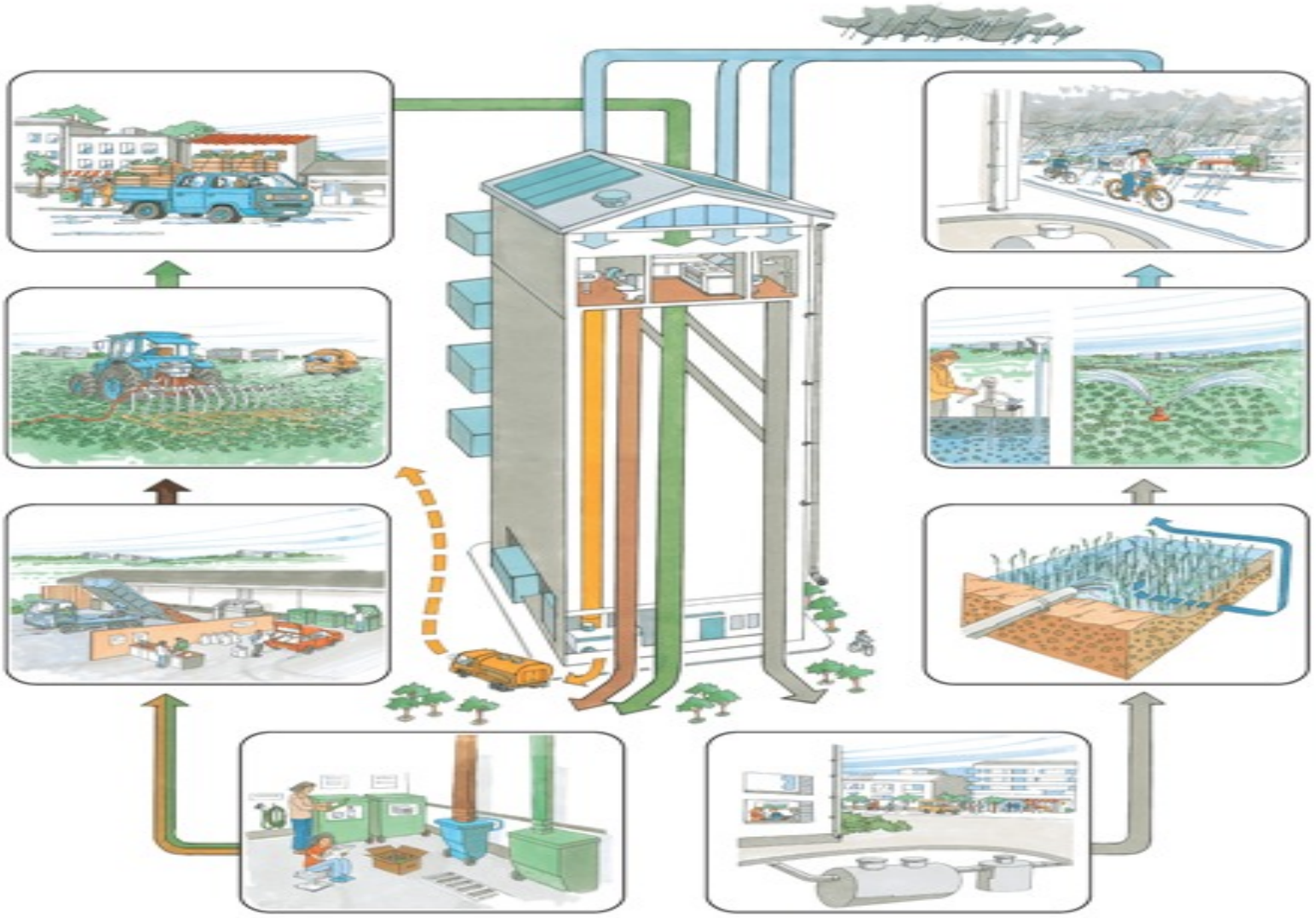
- Treat water as an economic commodity
- **Adopt sustainable and new technological innovations in water and sanitation to save water, prevent pollution and recycle**
- No subsidy for wealthy and industry
- Reduce wastage
- Promote Public private partnership
- Enabling laws, integrated management of services
- Full cost recovery of services
- Adequate O & M and capacity building
- Attracting funds beyond government sources
- Feasible city sanitation plans with targets for outcomes & coverage and indicators
- Good coordination with all stakeholders
- Sanitation data system for continuous monitoring and assessing health status

Urban sanitation system

- The users
- The collection
- The transport
- The treatment
- The end use ... of human excreta, greywater, storm water, solid waste and industrial wastewater



CLOSING THE LOOP ON SANITATION



Sida

EcoSanRes©
www.ecosanres.org

SEI

Urban ecosan –An Opportunity

- Urban upgrading (houses, apartments, offices, factories) including retrofitting of existing facilities such as flush and discharge toilet converted to separate
- Integrated ecosan in new urban development areas/apartments.
- Ecosan facilities (most particularly waterless urinals) in public places (Airport, Bus station, Railway Station, Malls etc.), tourist spots (Parks, Memorials, Museums, Other Scenic spots, Beaches etc.), schools/colleges, Hospitals, Factories/Tea-coffee gardens etc.
- Sanitation facilities in urban slums

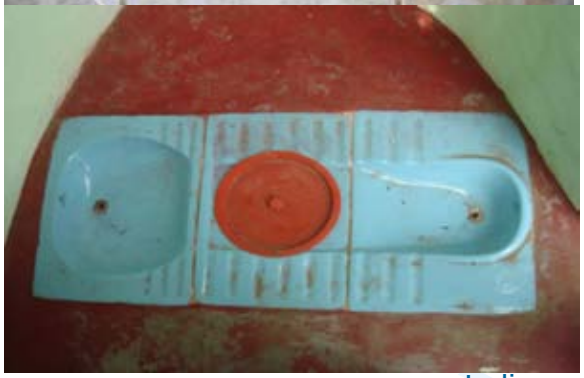
Ecosan-Advantages

- Recovery of nutrients & applying them safely in agriculture (marketing potential of urine and composted faeces)
- establishing a public-private partnership for operating the ecosan facilities.
- promoting urban farming including rooftop farming
- Helps in food security
- Better health care
- Reduced consumption of commercial fertilizer thus saving energy and thereof reducing carbon emission.
- Mass scale collection of urine can be used for converting urine in to dry crystalline fertilizer.
- Availability of liquid urine fertilizer for city green areas
- Extraction of phosphorous from urine

- Helps in establishment in resource oriented urban sanitation system
- Urine can be made available for research purposes to explore its medicinal properties.
- Provide an opportunity to directly switch to ecosan system by bypassing the sewer system. As in most of the class B and below urban areas does not have centralized sewer system.
- Reuse of water
- Energy saving in waste water treatment

Different types of urine Diverting Toilets

China



India

waterless: faeces and urine without flush

Wost-Man, Sweden

dry/wet: faeces without, urine with flush

Roediger, Germany

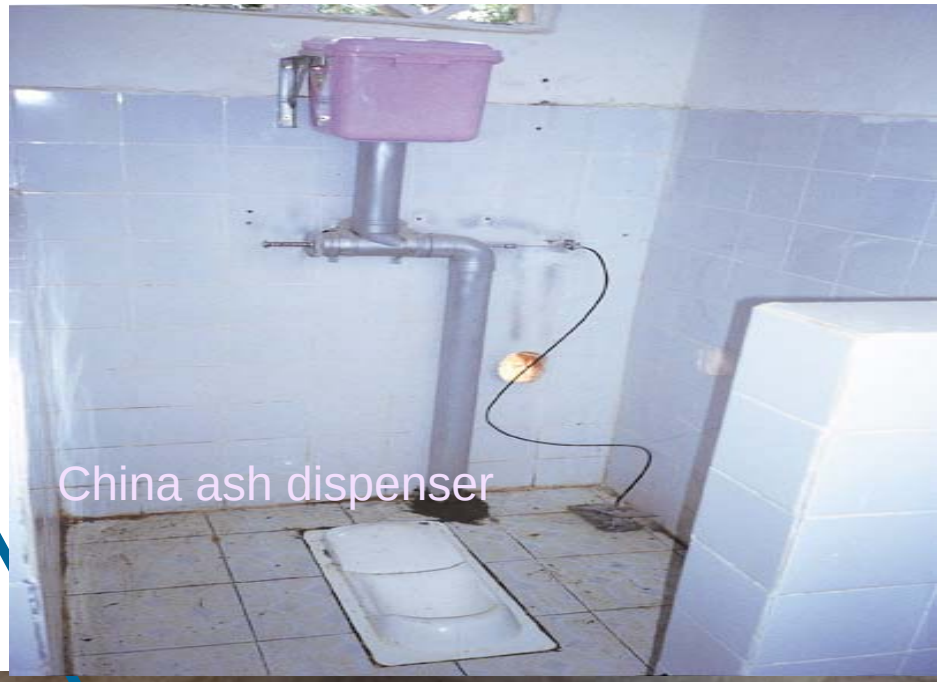
dry/wet: faeces with, urine without flush

Dubletten, Sweden

wet: faeces & urine with flush

Urine diverting latrines

Hole for anal wash water



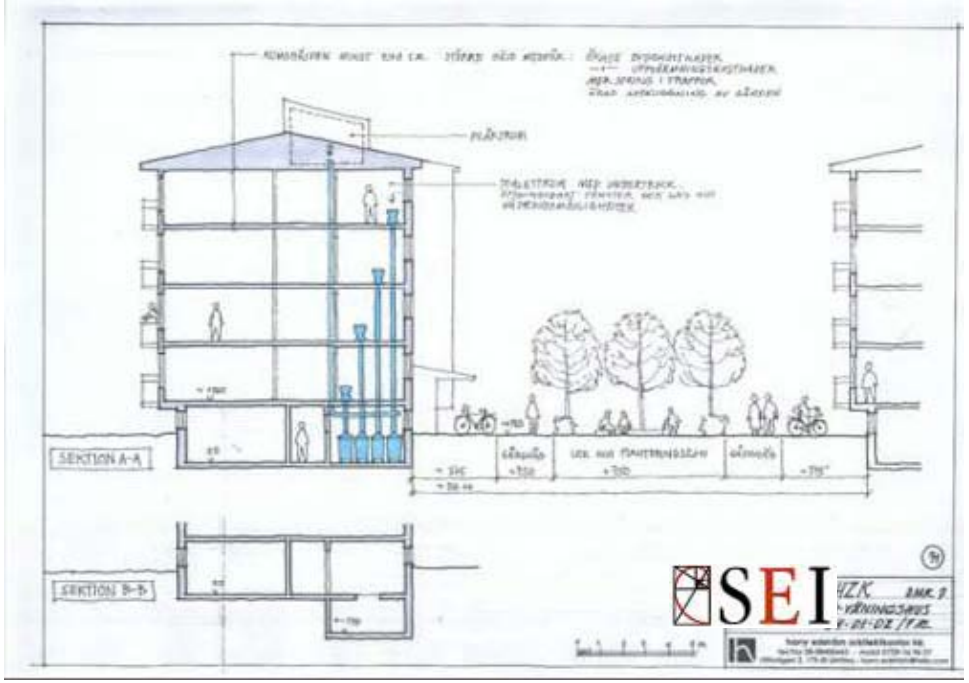
Back side of twin vault UDDT in India

UDDT ,MYRADA, India

UDDT, China

Scope, Musiri

Straight-drop dry urine-diverting toilet in multi-storey apartments in Dongsheng , China



Dongsheng, Inner Mongolia, China






UD/dry collection of urine and faeces, Dongsheng, China

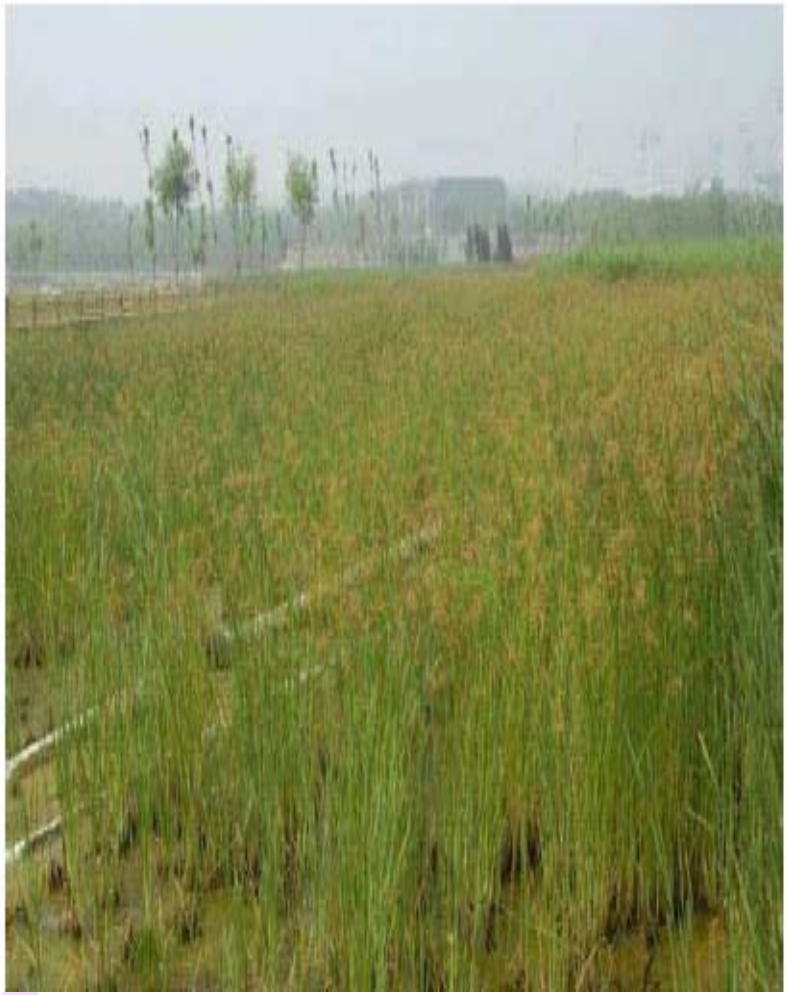
Piedestal toilet produced in China after Swedish-Chinese design collaboration.

Urine diverting vacuum system in Sino-Italian Environment & Energy building Beijing, China

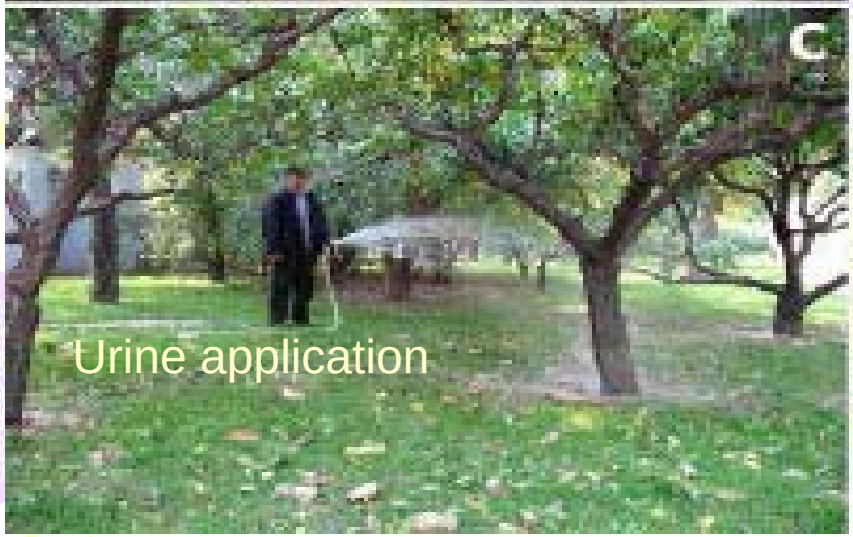
Collection and storage of urine and brown water

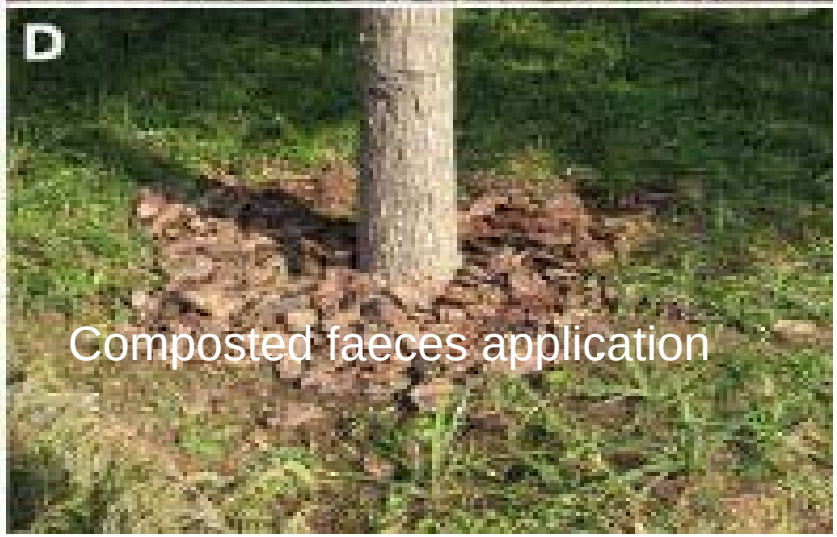
Urine diversion sanitation in Beijing forest park

Vertical wetland and vacuum truck -Beijing Park



Application system-Beijing Park





Waterless Urinals

Sweden

Germany

Ernst

Keramag

Urimat

Keramag waterless urinals

“IIT Zerodor - Waterless Urinal Odour Trap”






IIT Waterless Urinal demo

Products developed by Sheetal Ceramics , Ahmedabad

Waterless urinals at Tajmahal

Urine collection from waterless urinal in a school in Nagapattinam

5 good reasons for urine harvesting

Cheapest waterless urinal

- Urine is an excellent fertilizer
- Separation keeps the volume of potentially dangerous material (faeces) small
- Simplifies pathogen destruction in faeces
- Reduces odor
- Urine is rich in nitrogen

Storage tanks for urine

Photo: Eco San Res

Roof top farming at Bangalore

Important Publications and Proceedings

- WHO Guidelines for the safe use of wastewater, excreta and greywater at www.who.int/water_sanitation_health/wastewater/wwguidnew/en/index.html
- Pathways for Sustainable Sanitation - Achieving the Millennium Development Goals. A publication from EcoSanRes/SEI, published by International Water Association (IWA). ISBN: 1843391961/ISBN13: 9781843391968. See www.ecosanres.org/PathwaysForSustainableSanitation.htm
- Set of 13 Fact sheets from EcoSanRes Programme. Pl. refer to www.ecosanres.org/factsheets.htm
- List of twelve SuSanA working group. Pl. refer to http://www.susana.org/index.php/lang-en/working-groups
- Toilets That Make Compost by Peter Morgan at www.ecosanres.org/toilets_that_make_compost.htm
- Guidelines on the Use of Urine and Faeces in Crop Production. Jönsson et al. 35p. at www.ecosanres.org/pdf_files/ESR_Publications_2004/ESR2web.pdf
- Guidelines on the Safe Use of Urine and Faeces in Ecological Sanitation Systems. Schönning and Stenström. 38 p. at www.ecosanres.org/pdf_files/ESR_Publications_2004/ESR1web.pdf
- Ecological Sanitation, revised and enlarged edition, at www.ecosanres.org/ES2_download.htm
- Proceedings from 2008 World Water Week Seminar on Improve Food Security - Combine Productive Sanitation, Conservation Agriculture and Water Harvesting at www.ecosanres.org/WWW2008_ImproveFoodSecurity.htm

Thank You

prakaash.kr@gmail.com