



**EcoSan** Promotion Project - EPP  
a Component of the  
**Water Sector Reform Programme**

**WASTE / Nakuru, October 25th, 2008.**





## EcoSan Promotion Project - EPP

# EU-Water Facility / SIDA Co-financed EcoSan Promotion Project GTZ-Water Sector Reform Programme (WSRP) Ministry of Water and Irrigation / Kenya

### Main Cornerstones of the Project

**Implementation Period:**  
**November 2006 until October 2009\***

**\*) cost neutral extension of up to 1 year envisaged**

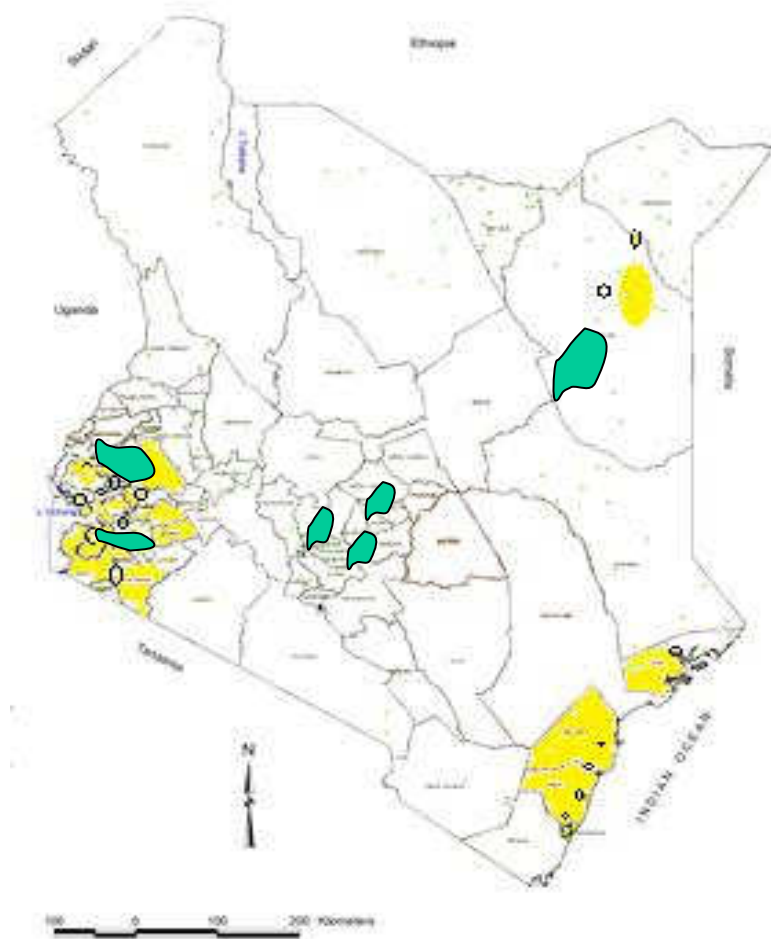
**Partner for Implementing**  
**Ministry of Water and Irrigation**

**Pilot Areas:**  
**North & South Lake Victoria,  
Southern Rift Valley, Central,  
North-Eastern Provinces**

**Core Indicator:**  
**10.000 Households or  
50.000 Beneficiaries reached**



## EcoSan Promotion Project - EPP



### Identified Pilot Areas for Implementation of EcoSan clusters (green)

### Sanitation Hot Spots (yellow) of

- Low Sanitation Coverage
- Frequent Cholera Outbreaks
- High Water Tables
- Unstable / Infertile Soils
- Flood Occurrence
- High Poverty Index

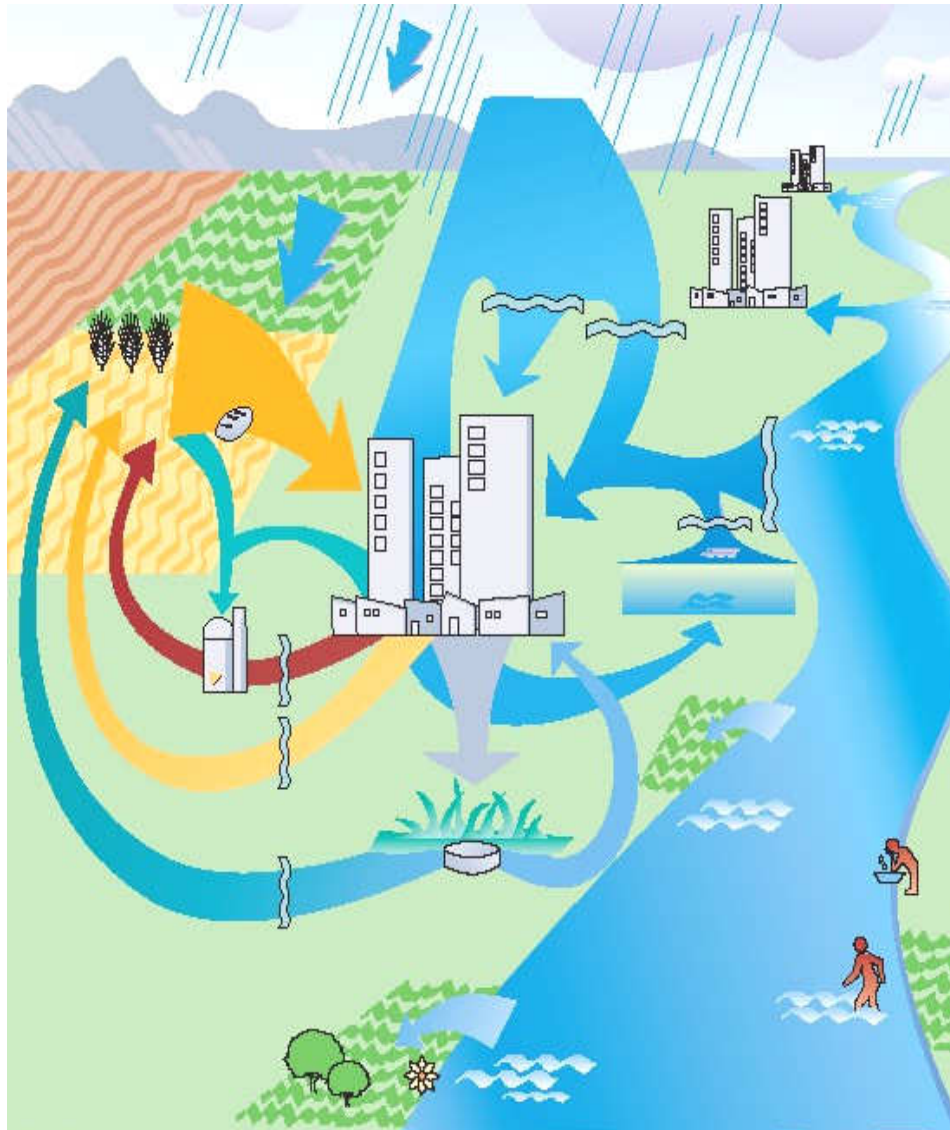
### Capacity Building on Sustainable & Environmental Friendly Sanitation for

- Min. of Water, Water Services Trust Fund,
- Water Service Providers
- Civil Society / Private Sector / Communities
- Other Government of Kenya Stakeholder



### **Main Intervention Lines for Pilot Implementations to Prepare Large Scale Roll-out in Kenya:**

1. Single households (Urine Diverting De-hydrating Toilets - UDDTs)
2. Public institutions like (boarding) schools, prisons, and small hospitals (Biogas digester / baffled reactor /constructed wetland)
3. Public places, such as markets, bus parks, and boat landings (water kiosk, low flush toilets connected to Biogas digester / sewer)
4. Informal Settlements (sanitation block with toilets, shower facilities, and community rooms, treatment by Biogas digester and baffled reactor)

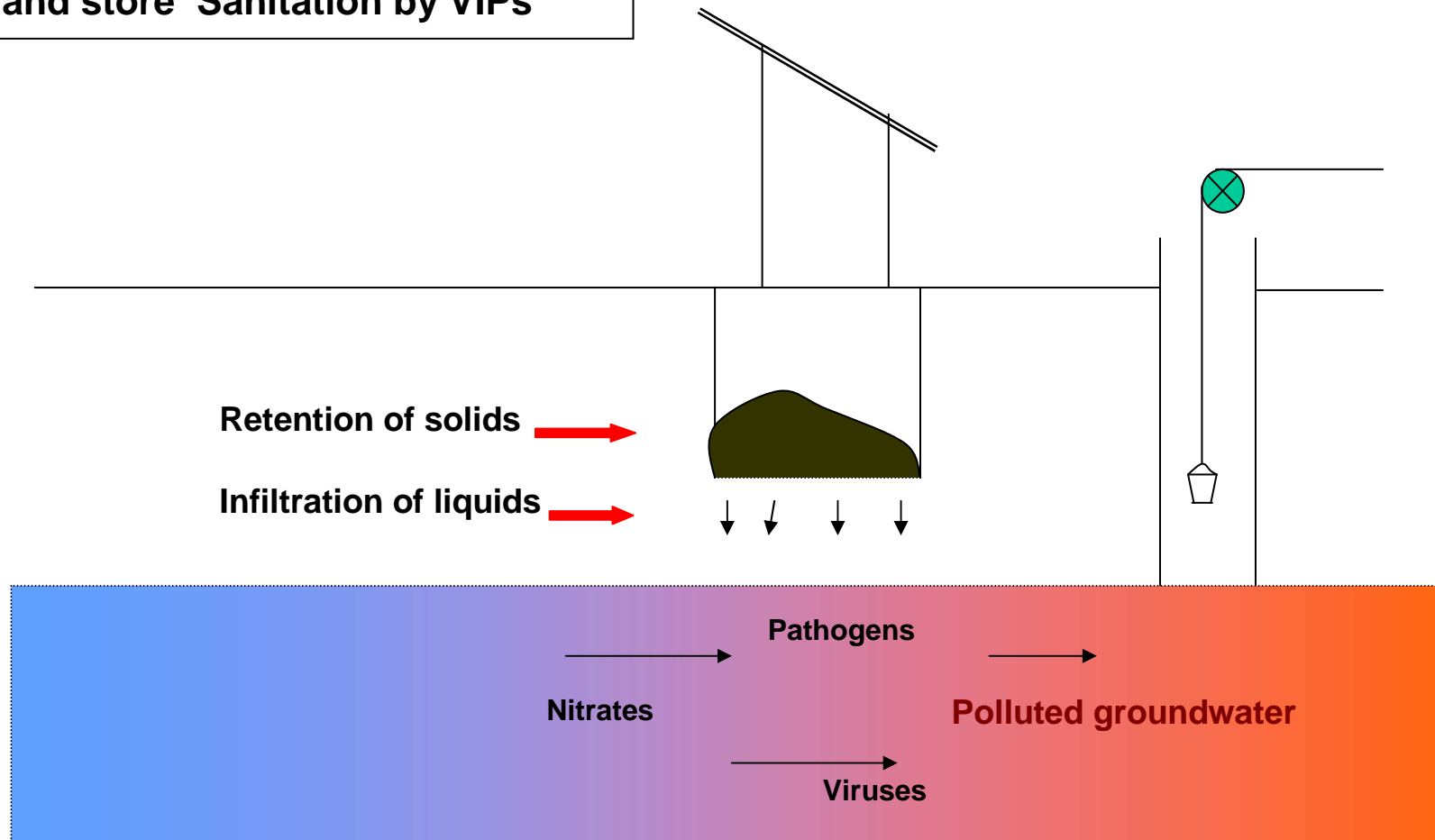


### Advantages of EcoSan or Sustainable Sanitation

- Improvement of health by minimizing the introduction of pathogens from human excrements into the water cycle
- Promotion of safe, hygienic recovery and use of nutrients, organics, trace elements, water and energy
- Preservation of soil fertility, Improvement of agricultural productivity
- Conservation of resources
- Preference for modular, decentralised partial-flow systems for more appropriate, cost-efficient solutions
- Promotion of a holistic, interdisciplinary approach

**Material flow cycle instead of disposal**

## Shortcomings of Conventional 'drop and store' Sanitation by VIPs





## Typical Situations in Schools



Up to 21 pit latrines on one school compound

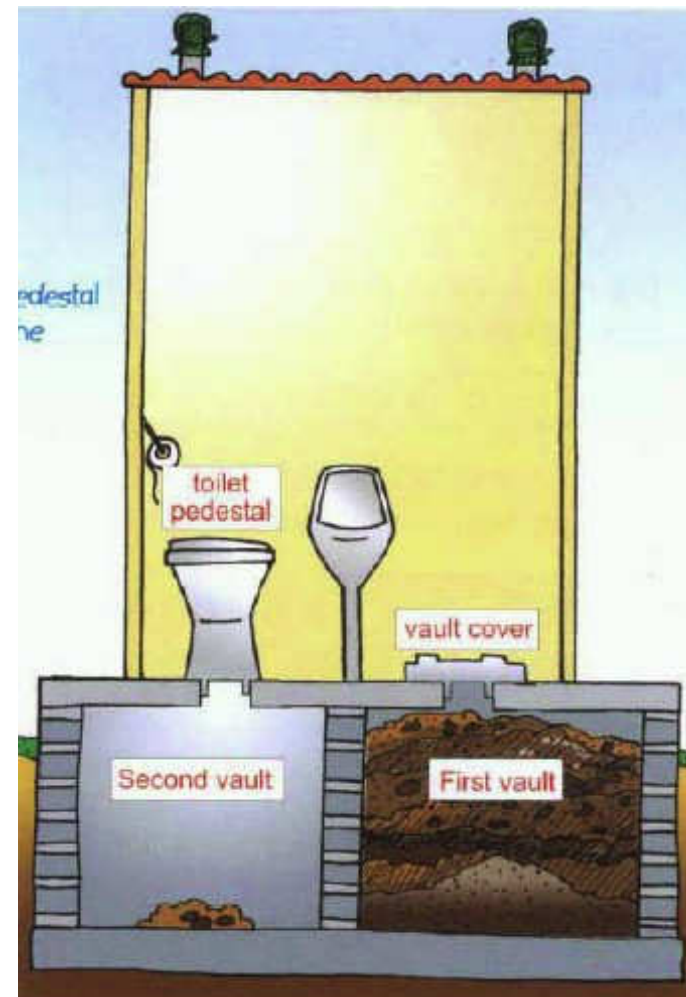


Rural boarding school with basic sanitation by costly erected but poorly maintained VIP-latrines (left)

Remains of more than 30 abundant pit latrines on school compound in Nyanza (right)

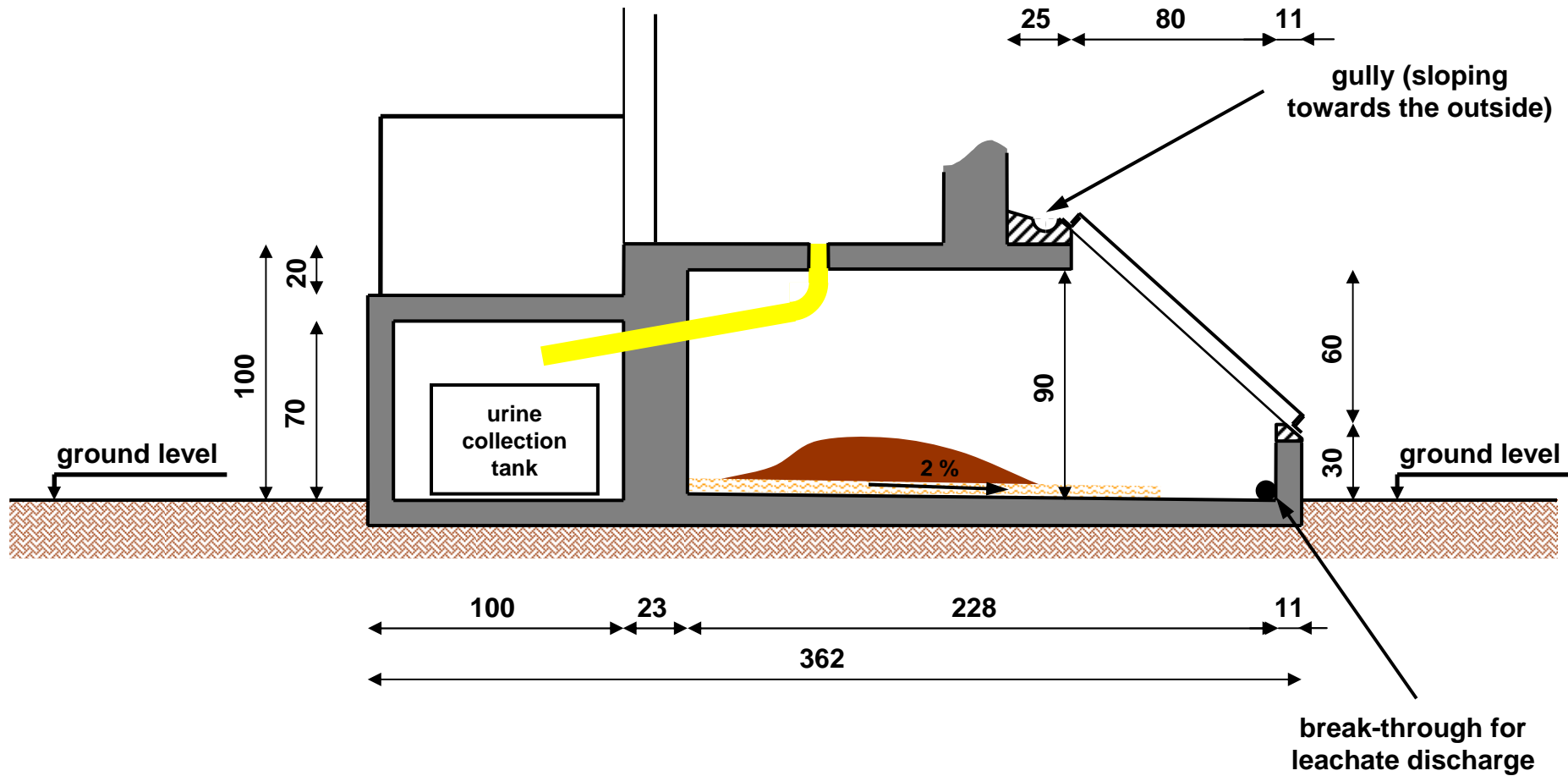


## Principles of an Urine Diverting De-hydrating Toilet





## EcoSan Technologies



## Urine Diverting De-hydrating Toilet - UDDT



Urine Diverting De-hydrating Toilets - UDDTs

## EcoSan Technologies Implemented

1. Urine Diverting De-hydrating Toilets on household and school levels (single and double door)
2. Low Flush Toilets connected to Biogas-Digesters & constructed wetlands for Institutions
3. Bio-Latrine-Centres for Public Places and Informal Settlements





## Dissemination of UDDTs in Western and Nyanza



**Cluster approach:**  
Double Door UDDTs for  
Schools & Churches  
and Single Household  
Installations in the  
Environment of the School



## Increase implementation Speed by Training of Artisans



Training on-the-job by adding at least 2 trainees to each of the experienced EcoSan artisans (Western and Nyanza Province) implemented via Community based Organisations (CBOs)







### EcoSan Technologies

#### **Advantages of Urine Diverting De-hydrating Toilets - UDDTs:**

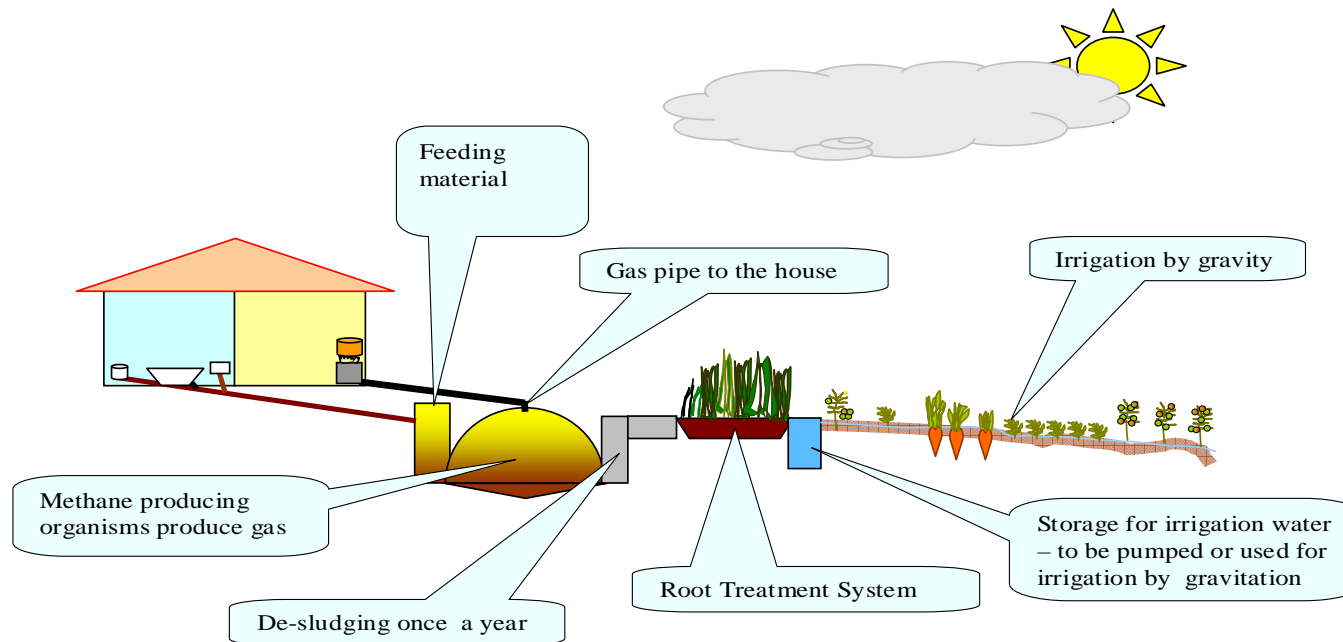
- no water usage
- good for areas with floods and unstable soil conditions
- enables the use of urine as fertiliser (N, P – fertiliser) and sanitised faeces (organic soil improver) in agriculture
- faeces are sanitised when collecting chamber needs to be discharged (2 chamber system preferred)
- prevents contamination of groundwater with pathogens, nitrate, etc. (no leaching of sewage)
- permanent construction (VIPs latrines mostly require re-construction after 2...3 years, when the pit is filled up)
- can be built and maintained with local material and knowledge



# EcoSan Promotion Project - EPP



# Small Biogas Plant For Wastewater, Kitchen And Garden Waste



**Sketch of biodigester replacing a septic tank.** Wastewater as well as kitchen and garden waste enter the digester and are broken down to biogas and fertile water.

**The advantages:** No more emptying of septic tank. Reuse of all water in the garden. Less cost on cooking energy.





## EcoSan Pilot Plant Kaurine Primary School (Maua District)

Sanitation  
facilities with up  
to 21 pit latrines  
on a school  
compound in a  
watershed area  
needed  
improvement



124 m<sup>3</sup> BG-plant,  
baffled reactors  
and 2x5-door poor  
flush toilet  
building.  
)







**EcoSan Pilot Project  
G.K. Prison in Meru**  
Treatment of the wastewaters of  
About 1. 500 inmates and 350 staff  
By a 110 m<sup>3</sup> Biogas plant, baffled  
reactor and a 4-door UDDT EcoSan  
Toilet for staffs





## **EcoSan Promotion Project - EPP**

**EcoSan Pilot Plant  
Gachoire Girls High  
School  
Kiambu /Kagwe District**

**Details of newly  
constructed  
124 m3 Biogas plant**

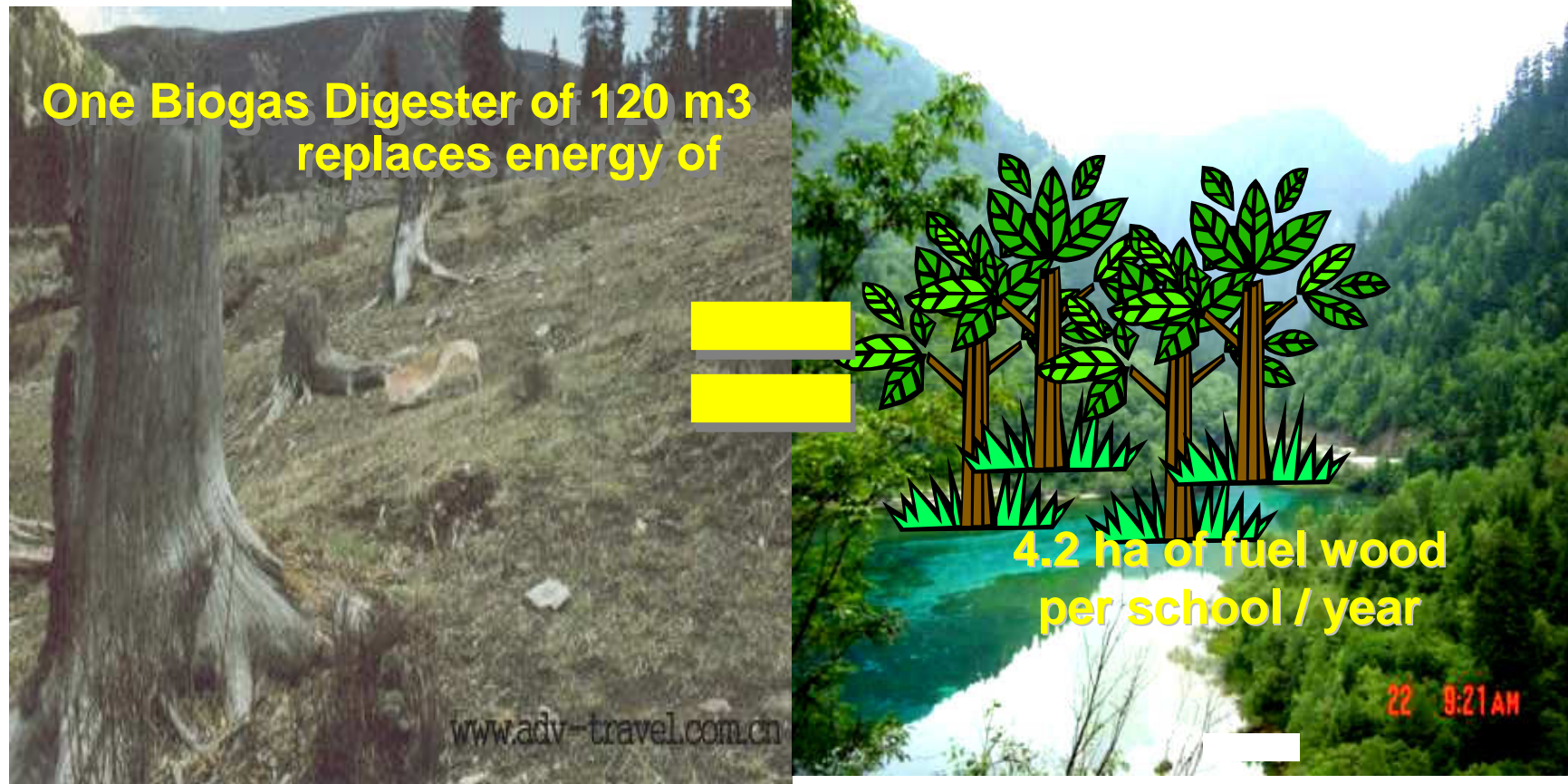


### EcoSan Technologies

#### **Benefits of on-site WW treatment systems for Institutions :**

1. UDDT (Urine Diverting De-hydrating) Toilets (see above) for staff
2. Biogas-Digester connected to low flush toilet (1. step)  
Reduces at least 50% of the WW freight by anaerobic bacterias  
Produces Biogas for Cooking replacing fuel wood  
Sludge for fertilizing  
Known technology from livestock farming
3. Buffered Reactor (2. step)  
treats effluent from BG digester down to WHO standards  
Produces Biogas for cooking  
Effluent is safe and can be used for irrigation with high nutrition value  
Very simple construction, reliable low maintenance
4. Constructed Wetland and/or polishing ponds (optional)  
either for final treatment of the system and/or separated greywater

## ENVIRONMENTAL AND ECOLOGICAL BENEFITS



One Biogas Digester of 120 m<sup>3</sup>  
replaces energy of

4.2 ha of fuel wood  
per school / year

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## EcoSan Promotion Project - EPP

### ▪ Future Tasks

1. Speed up large scale implementation, use cluster approach and cooperate with different partners for implementation (NGOs, SMEs, CBOs, WSTF-WSP)
2. Monitor and reduce construction costs per unit
3. Enhance owner contribution and strengthen local organizations and commercial sector
4. Ensure full use of by-products for agriculture (bio-fertilizer and Biogas)

### ▪ Implemented Urine Diverting De-hydrating Toilets - UDDTs)

- 4 door 1 unit at Gachoire Girls High School
- 4 door 1 unit in GK Prison / Meru
- 2 door 2 units at 4 Primary Schools / Mumias
- 2 door 1 unit at one church compound / Mumias
- 1 door units for 12 households / Mumias
- 1 door units at 5 pilot households in Madogashe / Lagdera District
- 1 door demonstration unit at Unilever tea estate / Kericho
- 2 door 2 units at 4 Primary Schools / Bungoma District, Western
- 1 door units for 12 households / Bungoma District, Western
- 1 door units for 16 households / Siaya District
- 2 door 2 unit at the district library and chiefs camp, Siaya District

### ▪ Implemented larger EcoSan Treatment Systems:

- |                             |  |
|-----------------------------|--|
| Gachoire Girls High School: | 124 m3 Biogas digester, baffled reactor, wetland             |
| GK Meru Prison:             | 110 m3 Biogas digester, baffled reactor                      |
| Naivasha Bus park:          | Water Kiosk, low flush toilet, 50 m3 Biogas digester         |
| Kaurine Primary School:     | 124 m3 Biogas digester (other components under construction) |



## EcoSan Promotion Project - EPP

**Asante Sana Kwa Kunisikiza!**  
**Thank you very much!**

