



DEWATS FOR SANO KHOKANA COMMUNITY

Sano Khokana, Lalitpur, NEPAL

Project Background

The community of Sano Khokana is a traditional village located about 7km south from Patan in the Kathmandu Valley. The towns pit latrines were upgraded to a sewer system discharging to a biogas plant and wastewater treatment system in 2007. The inhabitants are now able to use energy generated by the generator whilst protecting their agriculture fields and water sources and provide a cleaned supply for reuse.

Approximately 30 households are connected and five households are using the biogas generated. The upgrade works also included waste, stormwater and greywater management.

Kind of Project	DEWATS-Community Based Sanitation
Funding Agency	UN Habitat, Lumanti and Khokana Village Development Committee.
Implementing Agency	Lumanti and Khokana Village Development Committee
Supporting Organisation	ENPHO
Construction Period	2007
Construction Cost	NRs. 2,600,000 (US\$ 40,062)

Purpose

- To upgrade overflowing pit latrines to improve the long term health of community and environment.
- To demonstrate a community based wastewater treatment, waste recycling and biogas generation

System in Brief

All pit latrines connected to blackwater system and discharge into biogas digester. Greywater and stormwater diverted into channels and treated in baffled settler. Compost pits for sludge drying and horizontal reed bed and pond for final treatment of all wastewater prior to reuse for irrigation.

- Two grinders for waste and manure
- Biogas Plant for blackwater and waste
- Settler/ABR for greywater
- Two parallel compost pits for sludge/waste
- Horizontal flow wetland
- Pond

Salient Features

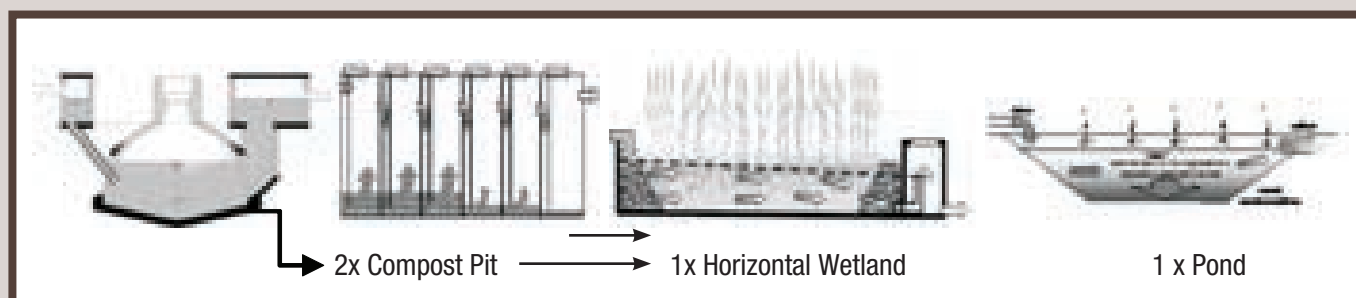
No. Treatment Plants:	1
Source:	Municipal wastewater
Design Capacity:	10-15m ³ /d
No. Users:	30 hh,
Peak flow:	NA
Influent Quality:	NA
Effluent Quality:	NA



Modules Adopted

Biogas -1 Unit	
Type:	Fixed Dome – GGC
Biogas Volume:	20m ³
ABR – 1 Unit	
Area Construction:	9m ²
Chambers:	3 baffle walls
Depth:	2m average
Compost/ Sludge Pit: 2 Parallel Beds	
Surface Area:	25m ² each
Depth:	1m average
Filter Material:	None
Planted Gravel Filter: 1 Horizontal Bed	
Surface Area:	225m ²
Depth:	0.55m average
Filter Material:	Gravel
Plants Used:	Phragmites karka
Pond: 1 Polishing Pond	
Area:	50m ²
Built Up Area:	300m²

Typical Drawing of Components



Operation and Maintenance

The operation and maintenance of the plant was undertaken by a caretaker (paid NRs1500/month) until start of 2010 when he quit over issues with waste separation. Currently there is little maintenance undertaken and the system is not operating as designed. Due to breakage of both grinders, little waste is added to the biogas digester (however some residents continue to add it, even flushing it down the toilet). Due to a broken pipe stormwater/greywater discharges into the sludge drying bed impacting the drying process. Additionally the separation of waste across the two sludge beds is not occurring, therefore one is very full, non compostable waste was also evident in both pits. The pipe to the wetland was blocked therefore all waste was discharging directly to the pond. Due to these reasons it is expected the treatment quality is not high. However only minor maintenance upgrade are required to reinstate the plant.

The treated wastewater is discharged into an irrigation channel for reuse. Biogas is piped to 5 households at quite a distance from the plant, with numerous bends and height gain. Sludge is not currently reused, probably because it is very wet and unstable.

Reuse Options

The biogas users are receiving a reliable supply and are finding the alternative gas supply more cost effective than LPG. The treated wastewater is discharged into the river and not reused at this stage. It would be appropriate to reuse for irrigation/agriculture however is too far from residential properties for household reuse.

Monitoring Results

The treatment system has not been monitored, therefore unknown treatment efficiency or quality.

Site Photos

