Factsheet on Decentralized Wastewater Treatment Systems (DEWATS) **5**

DEWATS FOR **SUNGA COMMUNITY**

Sunga, Madhyapur Thimi, NEPAL

Project Background

Sunga is located within the Madhyapur Thimi Municipality of Bhaktapur district. The wastewater treatment plant was constructed in 2005 to treat the sewage generated from 200 households in the community which was previously discharging directly into Siddhikali River. Currently sewage from 82 households is connected to the system.

The system is a showcase of larger scale application of DEWATS for community benefit and community managed wastewater treatment systems. It has provided a learning opportunity for many students, researchers and professionals who visit the plant regularly.

Kind of Project	DEWATS-Community Based Sanitation
Funding Agency	Asian Development Bank, UN Habitat, Water Aid
Implementing Agency	Sunga Wastewater Treatment Plant Management Committee
Supporting Organisation	ENPHO
Construction Period	2005-2006
Construction Cost	NRs. 2,100,000 (US$ 28,188)

Purpose

- To minimise the environmental impact on Siddhikali River by diverting the existing sewer through an appropriate wastewater treatment system.
- To demonstrate a community based wastewater treatment system.

System in Brief

Diverting the existing sewer through a medium scale treatment system prior to discharge into the river, the system includes the following treatment mechanisms to achieve the national discharge standards and minimise environmental impact.

- Bar screen and grit chamber
- Biogas plant (currently not in use)
- Settler and ABR
- Two parallel horizontal flow wetlands
- Two parallel vertical flow wetlands
- Sludge drying bed

Salient Features

Source	Municipal wastewater
Design Capacity	50m^3/d
No. Users	Currently 82hh, designed for 200 hh
Peak flow	50m^3/d
Influent Quality	BOD 1250mg/L
(2010)	COD 4032mg/L
Effluent Quality	BOD 70mg/L
(2010)	COD 272mg/L
Efficiency	94% BOD, 93% COD

Modules Adopted

Biogas digester – 1 unit	
Digester volume	35 m^3
ABR – 1 Unit	
Area Construction	18m^2
Chambers	3 baffle walls
Depth	2m average
Planted Gravel Filter: 2 Horizontal Beds	
Surface Area	76m^2 each
Depth	0.5m average
Filter Material	Gravel
Plants Used	*Phragmites karka*
Planted Gravel Filter: 2 Vertical Beds	
Surface Area	80m^2 each
Depth	0.55m average
Filter Material	Gravel
Plants Used	*Phragmites karka, Canna latifolia*
Planted Gravel Filter: 1 Sludge Drying Bed	
Area	55m2
Filter Media	Coarse sand, gravel
Built Up Area	1240m^2

Typical Drawing of Components

Biogas Chamber | Settler & ABR | 2x Horizontal Wetland | 2x Vertical Wetland

Operation and Maintenance

The operation and maintenance of the plant is managed by the "Sunga Wastewater Treatment Plant Management Committee". The day to day activities are undertaken by a paid caretaker from financial support of the municipality. Daily activities include unclogging the grate, cleaning the beds and checking the system is operating. Regular harvesting of plants and desludging of ABR is also undertaken by the caretaker who was trained in post construction maintenance activities. A few years ago when there was a major damage to the wastewater treatment plant due to heavy rainfall, the management committee mobilized resources from the municipality and other sources and did the maintenance. This indicates the ownership of the O&M responsibility by the community, which is an important factor for sustainability.

Reuse Options

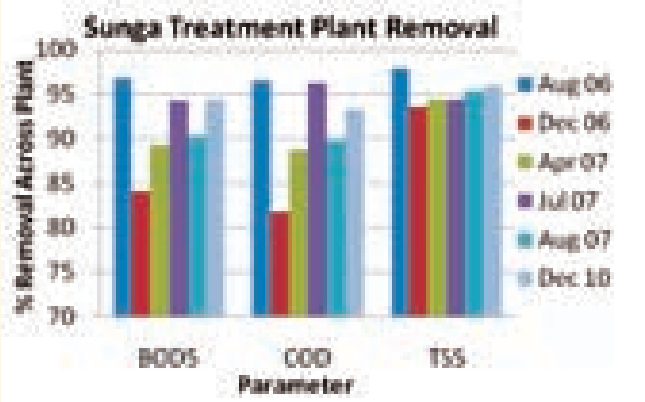
The treated wastewater is discharged into the river and not reused at this stage. The biogas can be used by the nearby school.

Monitoring Results

The treatment system has been monitored regularly since operation started in 2006. The results for 2006-2010 monitoring period are shown. Despite good overall removal Sunga often does not met Nepal discharge standards for BOD & COD.

Parameter	In	Out	%
pH	8	7	NA
TP (mg/l)	33	17	49%
NH4(mg/l)	122	42	66%
TSS (mg/L)	2810	58	98%
BOD5 (mg/L)	1489	179	88%
COD (mg/L)	3217	337	90%

Average 2006-2010



Site Photos

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Published by ENPHO, with assistance from

Consortium for DEWATS Dissemination Society | BORDA | Nepal Node for Sustainable Sanitation