



DEWATS FOR SRIKHANDAPUR COMMUNITY

Srikhandapur, Dhulikhel, NEPAL

Project Background

The Srikhandapur Wastewater Treatment Plant was constructed in 2008 to treat the sewage generated from ward 8 & 9 of the Dhulikhel Municipality. Approximately 2000 people are connected to the existing sewer which is diverted into the DEWATS for treatment prior to discharge into the river.

Five households are currently using the biogas produced by the treatment plant, with additional houses potentially connected in the future.

Kind of Project	DEWATS-Community Based Sanitation
Funding Agency	UN Habitat, Dhulikhel Municipality
Implementing Agency	Srikhandapur Sewage Treatment User Committee
Supporting Organisation	ENPHO
Construction Period	2008
Construction Cost	NRs. 5,550,000 (US\$ 81,602)

Purpose

- To improve environmental and hygienic conditions by providing appropriate wastewater treatment for Ward 8 & 9 of the Dhulikhel municipality.
- To produce biogas for local residents living near the plant as a sustainable alternative energy source for cooking.
- To demonstrate the application of biogas and DEWATS at a community scale

System in Brief

A medium scale treatment system to generate biogas and treat municipal wastewater with horizontal flow wetlands prior to discharge.

- Flow diversion from main sewer
- Grit chamber and bar screen
- Two parallel biogas units
- Outlet discharge to all 6 wetlands
- Six parallel horizontal flow wetlands
- Sludge drying beds

Salient Features

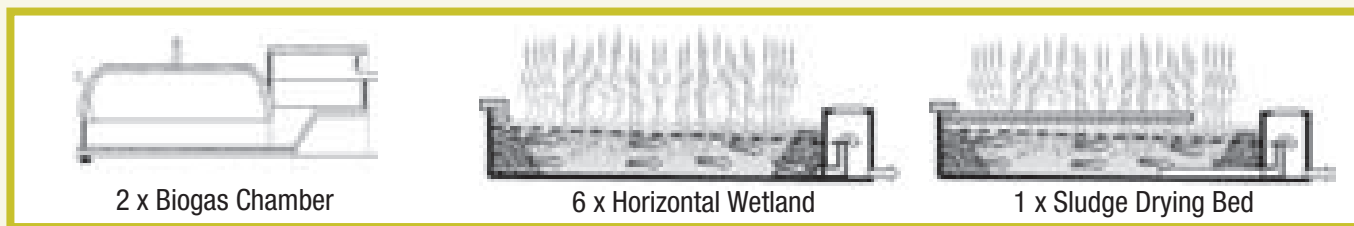
Source	Municipal wastewater
Design Capacity	103m ³ /d, peak 205 m ³ /d
No. Users	Designed for 200 h/h, currently 125hh
Peak flow	50m ³ /d (off-peak)
Influent Quality (2010)	BOD 90mg/L COD 406mg/L
Effluent Quality (2010)	BOD 10-20 mg/L COD 171-250mg/L
Ave Efficiency	83% BOD, 48% COD



Modules Adopted

Biogas - 2 Units in parallel	
Type	Fixed Dome
Biogas Volume	75m ³ each
Construction Area	93m ² each
Planted Gravel Filter: 6 Horizontal Wetlands	
Surface Area	Total Area 1050m ² , Average 175m ² each
Depth	0.4m average
Filter Material	Gravel
Plants Used	<i>Phragmites karka</i>
Planted Gravel Filter: 1 Sludge Drying Bed	
Surface Area	104m ²
Filter Media	Coarse sand, gravel
Built Up Area	1240m ²

Typical Drawing of Components



Operation and Maintenance

The wastewater treatment plant and biogas distribution are operated and maintained by the members of the local community based organization named “Srikhandapur Sewage Treatment Users Committee”. The user committee president and a part time caretaker are the main staff involved in O&M. Daily activities include opening/closing the gas valve between 5:30am and 8:30pm, as well as checking the inlet pit to the wetlands. Weekly maintenance includes cleaning the screen and grit chamber, cleaning the wetland inlet channels and occasional harvesting.

The sludge drying bed has not been used so far. Biogas users reported that the supply has been reliable and they receive gas for the majority of the year. Occasionally, the gas pipe becomes blocked. However this is repaired by the user committee within 2-3 days. The operation and maintenance costs including the caretaker’s salary are covered by the fee paid by the biogas users (5 households) who each pay NRs 350 per month.

Reuse Options

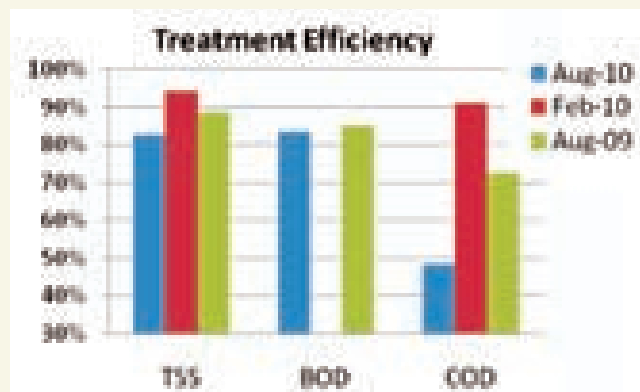
The biogas users are receiving a reliable supply and are finding the alternative gas supply more cost effective than LPG. The treated wastewater is discharged into the river and not reused at this stage. It would be appropriate to reuse for irrigation/agriculture however is too far from residential properties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

Monitoring Results

The treatment system has been monitored regularly since operation started in 2009. The results can be seen in the attached graph and most recent results in the table.

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

