Factsheet on Decentralized Wastewater Treatment Systems (DEWATS) **4**

DEWATS AT **ICIMOD**

Khumaltar, Kathmandu, NEPAL

Project Background

The International Centre of Integrated Mountain Development (ICIMOD) is a regional knowledge development and learning centre servicing the eight countries of the Hindu Kush-Himalayas. Their works focus on protecting the mountain ecosystems and people from the effects of globalization and climate change.

The main office in Khumaltar, Kathmandu, includes many sustainable features aimed at reducing ICIMOD's impact on the environment. They have recently installed DEWATS for treatment of wastewater from the main office and reuse of treated water in the gardens. They are also currently constructing another DEWATS for treating the wastewater from the maintenance building and car washing.

Kind of Project	DEWATS-SME (Institutional)
Funding Agency	Private
Implementing Agency	Private
Supporting Organisation	Self
Construction Period	2010
Construction Cost	NRs. 710,000 (US$ 9,505)

Purpose

- Reduce the office's impact on the environment and protect downstream waterways and groundwater;
- Provide an alternative water source for irrigation;
- Demonstrate the benefits of DEWATS for use in future projects and to other organisations;

System in Brief

A small scale system comprising of settling tank which receives all wastewater from the main building septic tank. The last chamber contains a submerged pump for intermittent loading of the vertical flow wetland. An outlet storage tank has another pump for reuse of treated water.

- Settling tank (two chambers)
- Level trigger submerged pump
- Vertical Flow Wetland
- Storage tank for reuse

Also

- Rainwater harvesting, solar heating, solar power, electric cars.

Salient Features

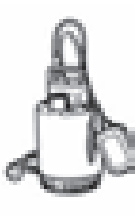
Source	Main building wastewater
Design Capacity	6m^3/d
No. Users	200 staff
Peak flow	Not known
Influent Quality	BOD 250mg/L
(2010)	COD 391mg/L
Effluent Quality	BOD 48mg/L
(2010)	COD 91mg/L
Efficiency	81% BOD, 77% COD

Modules Adopted

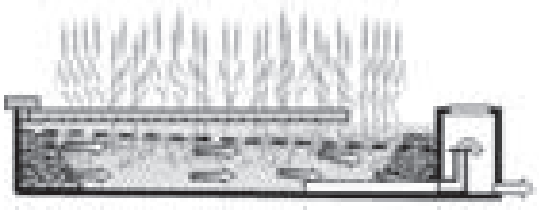
Settling Tank - 1 Units	
No. Tanks:	1
Settler Volume:	13.5m^3
Chambers	2
Inlet to Wetland	Submerged pump
Planted Gravel Filter: Vertical Reed Bed	
Surface area:	39m^2
Depth	0.7m average
Filter Material:	Coarse sand & gravel
Plants Used:	*Phragmites karka*
Storage Tank for Reuse	
Volume	9.5m^2
Total System Area	55m^2

Typical Drawing of Components

Settling Tank



Pump



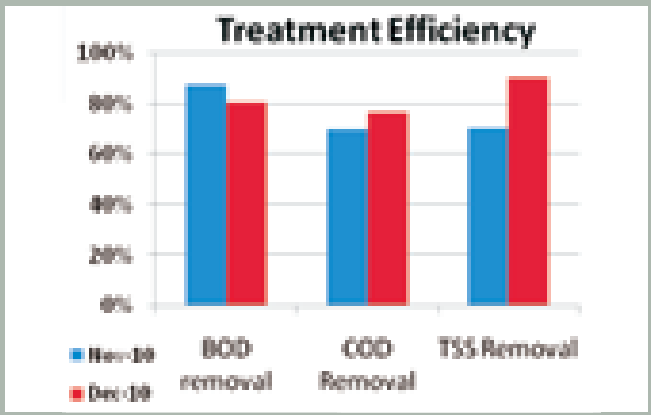
Vertical Wetland

Outlet for Reuse

Operation and Maintenance

The system has been in operation for only three months and since it was well made it is in very good conditions. The reeds have taken well and the distribution system including submerged pump (supplied by grid including generator back-up) appears very effective in evenly distributing flow.

Little operation and maintenance is required at this early stage, however the ICIMOD office maintenance staff are currently removing weeds and overgrowth and turning on the pump for reuse.



Reuse Options

Treated greywater is being used for irrigation only at this stage, however there is potential to increase this to car washing and toilet flushing in the future due to the very good discharge quality.

Monitoring Results

The system was monitored when first constructed and achieved very good results. When monitored again for this study after 3 months of operation the BOD and COD removal was 81% and 77% respectively.

Parameters	In	Out	% change
pH	7.8	7.6	NA
PO4(mg/L)	8.9	1.3	86%
NO3(mg/L)	140	72.5	48%
TSS (mg/L)	162	15	91%
BOD5(mg/L)	250	47.5	81%
COD(mg/L)	391	91	77%

ENPHO Jan 2010

Site Photos

For more information,
Environment and Public Health Organisation (ENPHO)
110/25, Adarsa Marg-1 New Baneshwor,
GPO Box 4102, Kathmandu • **Tel:**+977-01-4493188
Email: enpho@enpho.org • **Web:** www.enpho.org

Published by ENPHO, with assistance from

Consortium for DEWATS Dissemination Society

BORDA

Nepal Node for Sustainable Sanitation