

Prologue:

Warm greetings from CDD Society!.....

Project fact sheet:

DEWATS at Sat Guru

Research on Sanitation:

Quick scan health benefits and costs of water supply and sanitation by J. J. Bos et al.

Picture of the month:



National level training on Decentralised Wastewater Treatment Systems (DEWATS)

DEWATS Elements:

Anaerobic treatment process and biogas production from domestic wastewater

WW Analysis:

Preparation, Procedure, Important Tips...

Interview:

An interview was held with Susmita Sinha, Coordinator for Capacity Building Unit, CDD Society, on DEWATS Training Programs conducted by CDD.

Events:

- International onsite Training Program on Community-based MHPU- 21st Sep-2 Oct, 2009
- Engineers' Training on Decentralised Wastewater Treatment Systems (DEWATS) in December 2009
- DEWATS Project Managers Training in December 2009

Interesting Link:

http://www.eawag.ch/index_EN

Quiz:

Test your knowledge...

@ - Disha Newsletter

Published regularly by



Consortium for
DEWATS
Dissemination
Society

CDD-Society
#621, 5th Main Road
OMBR Layout, Banaswadi
Post
Bangalore- 560 043
+91-80-25452804/05

Supported by:



BORDA
Bremen Overseas and
Development
Association



German Federal
Ministry for
Economic Co-
Operation and
Development



The Commission
of the European
Union



Free
Hanseatic
City of
Bremen

Prologue:

Warm greetings from CDD Society! We have the pleasure to bring to you the November 2009 issue of e-Disha, the last issue of the newsletter for 2009.

This year, CDD and its Partner network made constant efforts to disseminate basic need services through successful project implementation and capacity building services. We will continue our efforts to disseminate knowledge so as to promote sustainable sanitation solutions in South Asia. We would like to express our sincere thanks to you for your constant support and encouragement.

The Editorial Team would be pleased to receive feedback and suggestions. Contributions to the Newsletter are most welcome.

Picture of the month:



Fig: National level training on Decentralised Wastewater Treatment Systems (DEWATS)

This Training Program was organised by CDD Society with support from Bremen Overseas Research Development Association (BORDA) and Rajiv Gandhi Rural Housing Corporation Limited (RGRHCL) at EVOMA, Bangalore, from 7th through 12th September, 2009. 15 engineers from various sectors across India and Bhutan were trained.

The 6-day Training consisted of interactive sessions, field visits, analysis of case studies and hands-on training by professionals from CDD Society, BORDA and related organisations representing a balance of academicians and practitioners. This Training was very helpful in exchanging and gaining knowledge on DEWATS implementation, and maintenance.

Project fact sheet:

DEWATS at Sat Guru

<http://www.borda-sa.org/modules/wfdownloads/visit.php?cid=6&lid=99>

Research on sanitation:

Quick scan health benefits and costs of water supply and sanitation by J. J. Bos et al.

The objective of this document was to report on a preliminary assessment (quick scan) of costs of water and sanitation services (WSS) in relation to population health, and to identify possible options to reduce the burden of water-related diseases in a more cost-effective way. WSS interventions also generate substantial benefits in terms of environmental sustainability and economic activities. Read more.....

http://www.gpa.unep.org/documents/quick_scan_health_benefits_english.pdf

DEWATS Elements:

Anaerobic treatment process and biogas production from domestic wastewater

In the wastewater treatment industry anaerobic digestion has long been used as a means of reducing the amount of organic matter, which must be treated. Anaerobic bacteria degrade or break down organic material in the absence of oxygen and produce “biogas” as a metabolic product. Biogas produced in anaerobic conditions consists of methane (50 - 80%), carbon dioxide (20-50%), and trace levels of other gases such as hydrogen, carbon monoxide, nitrogen, and hydrogen sulphide. The relative percentage of these gases in biogas depends on the feed material and management of the process. Methane, a combustible gas, can be used as an alternative energy source. Anaerobic digestion also leads to reduction of total bio-solids volume of up to 50-80% and the final waste sludge that is biologically stable can serve as rich humus for agriculture.

Biogas technology is an anaerobic treatment system that can be used on-site. The technology is efficient and provides a cost-effective method of disposing organic wastes and producing fuel and fertilizers. A well maintained anaerobic digester should produce 1 m^3 gas / m^3 digester volume and the gas should constitute 70 % methane and 30% carbon dioxide and can easily be reused for cooking and lighting. Approximately 90% of the feedstock to reactors should be water and urine with bio-solid waste comprising the remainder. The dry matter comprises of 79% organic material and 21% inorganic. Therefore, biogas technology can be used in places where sanitary ablution is practiced. Thus municipal wastewater can also be treated using biogas technology to produce biogas that can be used for lighting or heating. The DEWATS approach to wastewater treatment comprises a biogas unit in conjunction with other treatment modules to ensure treatment up to a level that renders the treated wastewater reusable for a variety of purposes.

Municipal wastewater or domestic sewage generally has a BOD and COD of 110-350 and 250-800 mg/l and total suspended solids of around 120-370 mg/l. Approximately 200 litres of biogas can be recovered from every kilogram of COD that is removed from wastewater. Wastewater from one household generally produces approximately 2-3 m^3 of biogas per day. The calorific value of methane is 9.94 kWh/m^3 . As a rule of thumb 1 m^3 biogas can substitute 5 kg of firewood or 0.6 l of diesel fuel.

Advantages of anaerobic digesters (Biogas technology / anaerobic digestion treatment)

- Production of valuable alternative energy in the form of methane
- Low investment costs and low space requirements
- Applicable at small as well as large scale
- Low production of sludge, which is well stabilized
- Improves sanitary condition

Wastewater Analysis:

BOD CELL TEST

For the determination of Biochemical Oxygen Demand (BOD) from 0.5-3000 mg/L.

● **Preparation**

The pH of the sample must be in the range 6-8. The pH of the solution must be in the range 2.3-3.3, and the temperature of all samples and reagents should be 19⁰-21⁰C

● **Procedure**

1. Dilution: Samples with a BOD higher than 12 mg/l must be diluted with nutrient salt solution as specified in the table below:

BOD in mg/l	12-50	50-100	100-500	500-1000	1000-3000
Sample + nutrient salt solution	1+9	1+19	1+99	1+199	1+499
Dilution Factor	10	20	100	200	500

2. The nutrient salt solution should be prepared as follows:

- Fill 20 ml of wastewater into a 1 litre volumetric flask.
- Dissolve the total contents of the vial containing the BOD nutrient salt mixture in drinking water and transfer quantitatively to the volumetric flask.
- Fill the volumetric flask to the 1-litre mark with drinking water and mix.

Samples with a BOD up to 12 mg/l must be inoculated by dissolving one vial of BOD nutrient salt mixture in 1 L of the original sample.

3. Preparation of oxygen reaction bottles.

- With microspoon place 1-2 glass beads in each of 4 oxygen reaction bottles.
- Fill two of the bottles to overflowing with the prepared sample. Fill the other 2 with the nutrient salt solution.
- Determine the oxygen concentration (step 3) of one sample and one salt solution bottle, and incubate the other 2 bubble free at 20⁰C for 5 days.

4. Determining the oxygen concentration

- Add 5 drops of reagent BSB-1K to each oxygen reaction bottle.
- Add 10 drops of reagent BSB-2K to each oxygen reaction bottle (sample free) and mix for 10 seconds.
- Add 10 drops of reagent BSB-3K to each oxygen reaction bottle (sample free) and mix.
- Immediately fill the measurement sample and the blank into the photometer.

5. Calculate the BOD value

- BOD₅ of measurement sample in mg/l (A) =
- (Initial oxygen conc. of sample bottle) - (final oxygen conc. of sample bottle) - (initial oxygen conc. of blank bottle) + (final oxygen conc. of blank bottle)



- Initial blank oxygen conc. - Final blank oxygen concn.
- BOD_5 of the original sample = $A \times \text{dilution factor} - B$ in mg/l
- **Important**

It is advised to perform each determination in duplicate and average the result

Interview:

An interview with Susmita Sinha, Coordinator for Capacity Building Unit, CDD Society

1. What is CDD's Capacity Building Plan?

Provision of basic need services and especially sanitation coverage has improved in the last few years. However, there are still millions of people without adequate basic essentials like water and sanitation. Therefore CDD aims to up-scale provision of decentralised basic need services through expansion of the critical mass of service providers that would lead to poverty alleviation and sustainable protection of natural resources in South Asia. These qualified and certified multiplication agents (service providers) are trained through CDD's capacity building activities to implement decentralised basic need services.



4. What are the training programs conducted so far by CDD?

During 2009, CDD has conducted various knowledge sharing programmes for planning and architecture students, builders and architects and government officials. Training programs on designing DEWATS have been conducted as well as for implementation of construction.

5. What is the feedback from training participants?

Feedback from the training programs show that the trainees have gained appreciable knowledge and learnings on design and implementation of decentralised approaches to wastewater and sanitation and now have adequate understanding to adopt this alternative approach for managing these aspects.

6. What future training programs are planned by CDD?

The training programs planned are for knowledge and specific skill up-gradation. These are broadly divided into two target group categories

- i) the service providers, i.e. people who will implement projects or services and
- ii) the service demanders, i.e. people who request or demand these services.

The various training programs planned are for masons, construction supervisors, Operation and Maintenance for engineers, project managers, social (community) organisers for community based services, project monitoring, health and hygiene, income generation and quality management for all basic need services being provided by the CDD Network.

Events:

International onsite Training Program on Community-based Micro Hydro Power Units - 21st Sep-2 Oct, 2009

This Training Program was organised by LEDeG in collaboration with University of Applied Science Northwestern (FNHW) Switzerland and BORDA in Leh, Kargil District of Ladakh region from 21st September through 2nd October, 2009. 20 engineers working in water and energy sectors from different Government, non-government organisations and private firms participated.

The main objective of this Training Program was to systematically transfer knowledge and skills required for planning, implementation and management of successful community-based Micro Hydro Power Units. This Training was useful in exchanging and gaining knowledge on implementation and maintenance of Micro Hydro Power Units.

Engineers' Training on Decentralised Wastewater Treatment Systems (DEWATS) in December 2009

This Training Program aims at imparting skills required for planning, implementing and managing DEWATS with emphasis on civil design. It is being organised by CDD Society with the support of BORDA and RGRHCL at Bangalore, in December 2009. Participants would be from Government organizations or Agencies, non-government organizations and private firms.

The training approach would follow a participatory learning methodology combining lectures, illustrations and demonstrations and active participation of trainees.

DEWATS Project Managers Training in December 2009

This Training Program aims at strengthening the capacities of Project Managers on topics related to the management, sustainability and technical aspects for implementing CBS-DEWATS. The Program is being organised by CDD Society with the support of BORDA and RGRHCL, Bangalore in December 2009. Participants would be from Government organizations or Agencies, non-government organizations and private firms.

Interesting Link:

EAWAG

http://www.eawag.ch/index_EN

EAWAG is an Institute that is global leader in aquatic research. Its research, which is driven by the needs of society, provides the basis for innovative approaches and technologies in the water sector. Through close collaboration with experts from industry, government and professional associations, EAWAG plays an important bridging role between theory and practice, allowing new scientific insights to be rapidly implemented, truly a lab-to-land approach.

Quiz - Test your knowledge on Sanitation:

Q: How many tanker trucks would be needed to supply water to and transport wastewater from a town of about 10,000 inhabitants?

Source: WWD2000 Quiz Home page