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Electronic Newsletter on DEWATS Information for Sustainable Sanitation

Volume 7
Issue 3

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- Forthcoming Builders Workshop - June 2009

Interesting Link:

<http://www.envis.nic.in/>

Quiz:

Test your knowledge...

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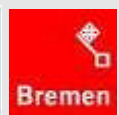
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Prologue:

Warm greetings from CDD Society! We have the pleasure to bring to you the May issue of e-Disha.

This Issue will highlight our steps towards capacity building and R&D plans defined for the 3rd Phase of the BMZ-BORDA supported Project. We are working towards successful accomplishment of the goals through preparing and conducting several seminars and workshops on capacity building and R&D topics.

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

Picture of the month:



Pic: Workshop on decentralised wastewater treatment approaches at the CEPT University in Ahmedabad

On 14th April 2009, the CDD team conducted a workshop on decentralised approaches to wastewater treatment as an alternative method for tackling the sanitation problems of growing cities and towns at the Center for Environmental Planning and Technology (CEPT), Ahmedabad. This Workshop was mainly conducted for the post graduate students and has generated a lot of interest among them.

Project fact sheet:

DEWATS at Anna University Campus

<http://www.borda-sa.org/modules/wfdownloads/visit.php?cid=6&lid=34>

Research on sanitation:

“Sanitation and Panchayats in infrastructure” by Dileep Mavalankar and Manjunath Shankar

Sanitation and water supply are the forgotten elements of infrastructure. It brings out the woeful status of sanitation and water in India and the rate of progress in the water and sanitation sector.

Read more at

<http://www.iitk.ac.in/3inetwork/html/reports/IIR-2004/Chap%2013%202003.pdf>

DEWATS Elements:

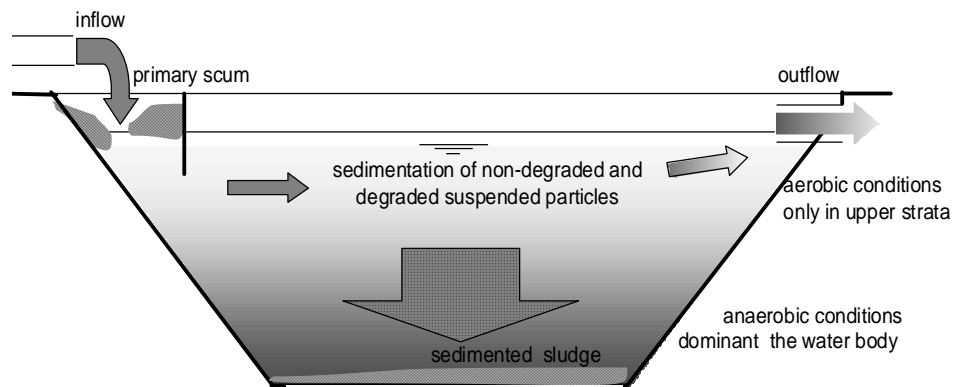
Anaerobic Pond

Anaerobic ponds are often used as the first treatment module for wastewater followed by aerobic ponds. The treatment in an anaerobic pond is by sedimentation, anaerobic degradation and sludge stabilization.

Anaerobic ponds effectively remove biological oxygen demand (BOD). They work well in warm climates, achieving 60% BOD removal at 20°C and over 75% at 25°C. These ponds are also effective in removing heavy metals which are precipitated as insoluble metal sulphides and in degrading certain organic compounds (such as phenols).

An anaerobic pond is designed for a depth of 2-6 m and generally has a high organic loading 0.1 to 1 kg BOD/cum.d with a hydraulic retention time of 1-30 days. The space required is generally around 4m²/m³ wastewater per day with length to breadth ratio of 2:1 to 3:1 to avoid sludge banks forming near the inlet. The anaerobic condition is maintained through the depth of the pond.

The process of anaerobic digestion in the pond produces hydrogen sulphide gas resulting in an unpleasant odour. This smell decreases once a thick layer of scum is formed on the surface. An anaerobic pond can also be used for biogas collection.



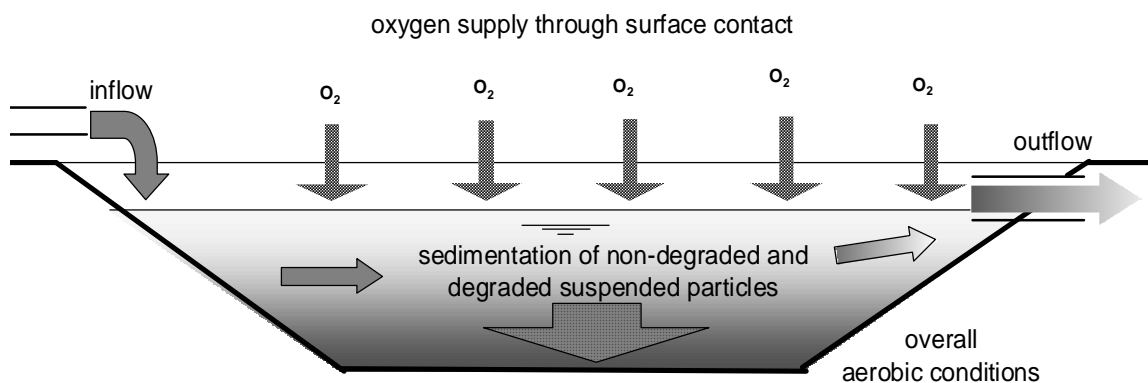
Pic: Anaerobic pond

Aerobic pond

Also known as Facultative stabilisation pond, an aerobic pond (0.9-1.2m deep) is suitable for weak (surface loading of 100-400 kg BOD/ha*d), pre-treated domestic or industrial wastewater. Aerobic ponds are designed for aerobic facultative degradation (settling of solids and breakdown of organic matter), pathogen reduction and COD removal of 60%-95% and BOD reduction of 50-70%. This is aided by algal growth and microbial/bacteria activities in the pond.

A large pond area of 25 m²/m³ wastewater per day with a hydraulic retention time of 5-20 days is required for proper functioning of an aerobic pond. The aerobic pond receives most of its oxygen via the water surface. Oxygen intake increases at lower temperature and with surface turbulence caused by wind and rain. The secondary source of oxygen comes from algae via photosynthesis.

It has been observed that algae could increase effluent BOD. Therefore, baffles or rock bedding located just before the outlet of each pond retain algae in the pond, reducing the BOD of the final effluent. Care should also be taken to prevent an intense growth of algae in the pond as this causes anaerobic conditions.



Pic. Aerobic Pond

Wastewater Analysis:

SULPHATE CELL TEST

For the determination of Sulphate concentration in the range of 50-500 mg/L Sulphate

I. Preparation

- Replace the black screw cap of the reagent bottle Sulphate-1K by the green dose metering cap
- Check the Sulphate content. Samples containing more than 500 mg/l Sulphate must be diluted with distilled water.
- The sample pH range must be 2-10; the pH of the measurement solution must be in the range 1-2.
- The temperature of the pre-treated sample should be 20-40°C.

Follow the stepwise procedure as depicted on the relevant information card in the Spectrophotometer.

1. Pipette 2ml of pre-treated sample into a reaction cell and mix.
2. Add 1 dose of reagent SO_4-1K to the cell, and shake vigorously until the reagent is completely dissolved.
3. Leave to stand for 2 minutes.
4. Measure

Important

- Filter turbid samples through a 0.45:μm membrane filter



Interview:

An interview with Prof. C. A Buckley, KZN University, Durban, RSA and the R&D Coordinator for BORDA Network.

1. What is your research experience with the DEWATS?

Through my position at a University I have supervised doctoral degree students (2 graduated and 2 current) and Masters degree students (7 graduated and 3 current) on anaerobic baffle reactor (ABR) projects. I have also investigated laboratory-scale ABRs and a 6 m³ pilot-scale reactor at a sewage works, supervised the monitoring of plants in Java and was involved in the design and construction of a technical evaluation system serving 80 households in South Africa.

2. What are the main R&D plans for the BORDA network?

The primary objective is to gain a better theoretical understanding of the processes occurring in the DEWATS system and to apply this knowledge to the design and operation of DEWATS systems. This entails investigations on:

- Wastewater feed characteristics to DEWATS processes and how it differs in different communities and countries
- Data-mining process monitoring information from all operational plants
- Assessing the performance of operational plants
- Modelling anaerobic processes in baffled reactors and anaerobic filters
- Performance characteristics of planted gravel filters following anaerobic processes
- Combining membrane processes to the DEWATS process
- Potential agricultural reuse options for DEWATS by product i.e treated wastewater
- Expanding the research network in Indonesia, India and Southern Africa.
- Investigating the performance of a container DEWATS plant for use in emergencies
- Quantifying the production rate and nature of the sludge produced from DEWATS plants



Pic: Prof. Buckley providing guidance during wastewater monitoring at Friends of Camphill. Bangalore

3. What are the R&D topics already investigated from BORDA networks?

- Assessing the performance of three operational plants (Java, Indonesia)
- Collation of the performance monitoring data (India)

4. What R&D topics are currently being investigated by the BORDA network?

- Performance evaluation of DEWATS plants in India, Indonesia and Southern Africa.
- Characterisation of wastewater quality in Indonesia
- Performance of membranes treating DEWATS product water
- The effect of un-level placement of the DEWATS emergency plant container on the flow distribution through the system

Events:

Forthcoming Builders Workshop - June 2009

This Workshop is being organised with the object of disseminating DEWATS to the builders lobby under a directive from the Karnataka State Government which directs all establishments generating more than 50 cum of wastewater to install an on-site treatment plant.

Expected participants will include real estate developers, architects, contractors and organizations supporting this sector. Speakers will include key staff from CDD Network. The Workshop will be a half-day event.

The expected outcome would be the generation of interest in decentralised wastewater treatment systems as an alternative to centralised systems and an understanding of the technical approach.

Workshop on Decentralised Wastewater Treatment Approaches at the CEPT University in Ahmedabad

On 14th, April 2009, the CDD team conducted a Workshop on decentralised wastewater treatment approaches at the Center for Environmental Planning and Technology (CEPT), Ahmedabad. The objective of this Workshop was to introduce students to alternate wastewater treatment to better address problems of sanitation by adopting a decentralised system.

The Workshop was successful with the students listening attentively to the presentations. They were introduced to BORDA and CDD and their activities, with a central focus on DEWATS' approaches and applications. A group work session was conducted which proved to be extremely engaging for the students.

Interesting Link:

<http://www.envis.nic.in/>

Environmental Information System (ENVIS)

Realising the importance of Environmental Information, the Government of India, in December, 1982, established an [Environmental Information System](http://www.envis.nic.in/) (ENVIS) as a Plan programme. The focus of ENVIS since inception has been on providing environmental information to decision makers, policy planners, scientists and engineers, research workers, etc. all over the country.

Quiz - Test your knowledge on Sanitation:

Q: Out of every 5 people worldwide, how many do not have access to basic sanitation?

Hint: youthink.worldbank.org/ issues