


Workshop
'Swachh Nagar – Making Toilets and Septic tanks work'

21st February, 2015
Maharashtra Environmental Engineering Training and Research Academy (MEETRA), Nashik

Organized by:
PAS Project, CEPT University, Ahmedabad
Maharashtra Environmental Engineering Training and Research Academy, Nashik
All India Institute of Local Self-Government, Mumbai

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CEPT UNIVERSITY

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Background / Introduction:

CEPT University and All India Institute of Local Self-Government (AIILSG), in partnership with Water Supply and Sanitation Department (WSSD), Government of Maharashtra and Maharashtra Jeevan Pradhikaran (MJP) had supported preparation of City Sanitation Plans (CSPs) for four small towns in Maharashtra – Ambajogai, Hingoli, Sinnar, and Wai. The focus of these CSPs was to assess options for low cost sanitation and decentralised solutions for wastewater management. This was initiated at the meeting with all four cities in Nashik in May 2012. The base assessments were subsequently shared with the city representatives in August 2012 and the draft CSPs were shared with representatives from all four cities at the third review meeting held at Maharashtra Environmental Engineering Training and Research Academy (MEETRA), Nasik on 25th April, 2013. Over the last two years, PAS Project teams have carried out baseline assessment across various sub-sectors and held meetings and consultative workshops in all the four towns.

Out of these four cities, two cities, namely Wai and Sinnar, had asked for further support in implementation of some of the priority solutions from the CSPs. The cities had prioritized two strategies for implementation 1.) Own toilet scheme for making city open defecation free; and 2.) A Citywide Faecal sludge management plan. The main aim of the first strategy is to make cities open defecation free through implementation of own toilet scheme. Government of India has launched a Swachh Bharat Mission on 2nd October, 2015 and an important goal of this mission is to make all towns Open defecation Free. In Maharashtra, many cities are aspiring to become open defecation free, but are not aware of the steps and processes that are involved. Also for implementation of the Own toilet scheme, it is important for private sector and urban local body officials to know the design norms and regulations for construction of toilets and septic tanks as it forms the design basis of the whole scheme.

In this context a workshop on 'Swachh Nagar – Making Toilets and Septic tanks work' was organized by CEPT University, AIILSG and MEETRA on 21st February, 2015 at MEETRA, Nashik. The workshop aimed to build capacity of municipal staff and local contractors regarding various design norms and regulations related to toilet and septic tank construction. The workshop also shared ideas on how to make cities open defecation free in line with the Swachh Bharat Mission guidelines. The participants were also informed of new technological developments in toilets.

The topics discussed during the workshop were:

1. Design norms for construction of toilet and septic tank construction.
2. Regulations related to toilet and septic tank construction.
3. Planning process to make cities open defecation free.
4. Share information on new technological developments in toilet technology.

The workshop was attended by participants from various municipal councils of Maharashtra, toilet technology service providers, local construction contractors and independent sector researcher/ experts. List of participants is attached as Annexure-I.

The workshop was initiated by Mr. Sudhir Patondikar of MEETRA. He welcomed the participants and briefly mentioned the importance of sanitation and cleanliness for cities. He also emphasized on the importance of Swachh Bharat Mission in today's context.

Presentations:

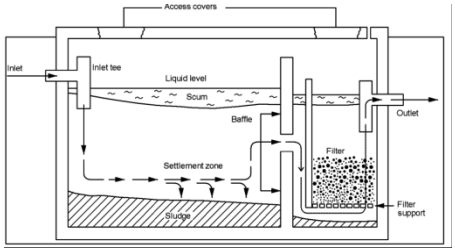
The CEPT team presented on "Swachh Nagar: Making toilet and septic tank works" where they discussed the existing sanitation situation in municipal councils of Maharashtra and importance of sanitation in urban context.. The presentation highlighted the existing sanitation scenario of Maharashtra and emphasized on high usage of community toilets. It was highlighted that even though the open defecation levels have decreased from 41% to 28% from 2001 to 2011, there is still a significant share of population defecating in the open in Maharashtra. The key reasons highlighted for open defecation were lack of space and funds for construction of individual toilets and poor maintenance of community toilets. The presentation also discussed various schemes and programs for sanitation run by the state and central government in the state. Information on Swachh Bharat Mission and its guidelines laid out by the central government was also shared. The team briefly discussed about the city sanitation planning process and planning for FSM.

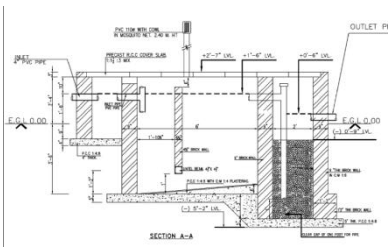
The AIILSG team presented the ongoing work in small towns of Wai and Sinnar of Maharashtra. The presentation summarized the existing situation of sanitation in both the cities. The presentation highlighted that poor condition of community toilets have ill effects on the health of the users and it becomes worse when number of users of community toilet increases. In this context it was highlighted that a private toilet for each family is a much better option over community toilets. If space is a constraint, group toilet (used by 2 to four) families can be considered. The presentation also discussed various financial institutions that can be approached for availing loans for construction of toilets to address the constraint of lack of funds.

Mr. Yogesh K. Bharadwaj, Bharadwaj Ecotech, Nashik presented on overview of existing rules and regulations for construction of septic tanks – like IS Codes, CPHEEO Manual, Model Building Bye-laws and National Building code. The presentation explained the functioning and importance of construction of septic tank as per design standards. He briefly explained the health and environmental hazards of the poor on-site disposal facilities. He highlighted that the septic tanks need to be constructed of appropriate capacity, and construction material for its proper functioning. During discussions he highlighted that the CPHEEO guidelines have now updated the cleaning interval of the septic tanks to 2-3 years. Whereas, in practice many septic tanks are not made as per design standards and are oversized and hence are cleaned after longer intervals, example: 10-15 years.

Mr. P. N. Gokhle, MEETRA presented on the new CPHEEO Manual and Advisory on septage management published by Government of India. The presentation highlighted that sewerage systems are costly and requires sufficient amount of water to function. Lack of water availability limits the implementation of sewerage systems in many cities. Use of septic tanks can be an ideal solution which is both, cost effective and long-lasting solution for areas with limited water availability. He narrated experience of Kolhapur, Ahmednagar and Nanded where sewerage network has been laid down and sewerage treatment plant has been constructed but the system is not functional.

He also presented various advanced onsite treatment options like septic tanks with upflow anaerobic filters and package septic tanks. During discussion it was highlighted that the biological activity inside a septic tank stops after 2-3 years and after that whatever wastewater comes in goes out of the septic tank without any treatment and therefore the BOD of outlet wastewater is low in initial 2-3 years and then it increases. Also during discussion it was pointed out that septage could be treated at an existing STP or there is a need to create a new treatment facility like Sludge drying bed (SDB) and this SDB technology would not have an offensive smell.



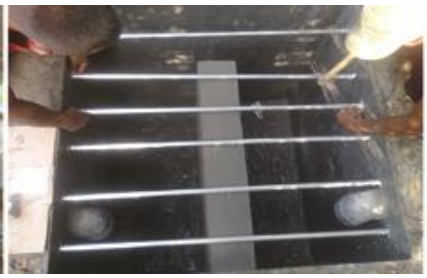


Mr. Yogesh K. Bharadwaj gave a brief presentation on Bio sanitizer which was promoted by Government of India. He explained that Bio sanitizer is a compact water and wastewater treatment bio-catalyst which contains various plant enzymes in its purified forms. These enzymes present degrade the organic component and produces active oxygen which neutralizes the pH of the medium. Hence, Bio

sanitizer is a naturally produced catalyst that continues to produce need-based amount of active oxygen and drives eco-logical reactions that clean polluted water (surface water, groundwater and wastewater). Bio sanitizer can be used for: Eco sanitation of Sewage Streams (Nallas), Decentralized Sewage Treatment etc.



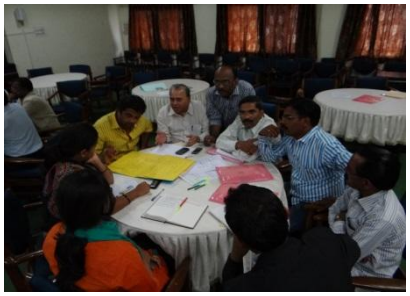
Mr. Nishi Kant Rai, BSA Corporation Limited presented on Bio-tanks/ bio-digester technology developed by Defence Research and Development Organization (DRDO).The presentation highlighted that the bio-digester technology has been developed for resolving the problems of un-decomposed human waste and this innovation degrades and converts the human waste into usable water and gas in an eco-friendly manner. The generated gas can be utilized for energy/ cooking and water for irrigation purposes. The process involves bacteria which feed upon the faecal matter inside the tank, through anaerobic process, which finally degrades the matter and releases methane gas that can be used for cooking, along with the treated water. He highlighted that the bio-digester tank can be manufactured and customized as per the requirement and can be used at various levels: individual, community or city level.


During the discussions it was pointed out that the cost of a biotank would range from Rs. 25,000-27,000 and along with superstructure it would cost Rs. 50,000. Also existing septic tanks can be connected to the biotank and the cost could be reduced by 20%. Mr. Nishi Kant pointed out that their company which is a ToT holder of DRDO technology provides 1-2 years of free maintenance and if required beyond that they enter into an annual maintenance contract. He also highlighted that there is also a technology named Master Bio-tank which can treat septage collected from septic tanks.

Group Discussions:

Group discussions were undertaken to identify issues and challenges that cities will face in becoming 'Swachh Nagar'. The participants were divided into three groups and each group was given five themes for discussion. Each group was asked to come up with possible solutions to the given issues/


problems.

Following were the five themes:

A. Issues related to design of toilets and septic tanks.
B. Costing of toilets as per DSR and contractors.
C. Effective technology for toilets and septic tanks.
D. Methods for septic tank cleaning and waste disposal.
E. Support required from the government.

The groups came out with the following solutions to the given issues/ problems:

A. Issues related to design of toilets and septic tanks:

1. *When a plan for construction of a toilet comes for approval, the city engineer checks the plan and its conformity with the design standards and approves the plan. The engineer should also conduct on ground verifications to check whether the septic tank is designed as per the standards or not.*
2. *The septic tank capacity should also consider greywater from kitchen and bathrooms.*
3. *Biological oxygen demand of the waste water can be reduced by using anaerobic filter systems in existing septic tank system.*
4. *Soil type should also be considered while designing of septic tanks in terms of use of construction material.*
5. *To promote use of individual toilet - water supply and electricity is very essential and ULB should ensure that they provide adequate water supply to households with toilets.*

B. Costing of toilets as per DSR and contractors:

1. *Private contractors said that rates that are specified in DSR are low as compared to actual construction cost.*
2. *Central, state and ULB subsidies can make the toilets available to the people at lower cost.*
3. *Costing of toilet is also dependent on availability of local construction materials*

4. *Cities were convinced that the idea of group / individual toilet is much better than Community toilets in terms of life cycle costing.*

C. Effective technology for toilets and septic tanks:

1. *DRDO Bio digester technology can be used as it is space effective, cost effective and maintenance free.*
2. *The Bio tank can be used at individual and community level. For city level we can use master bio-tank to treat the collected septage.*
3. *Upflow anaerobic filter systems can be used in existing septic tanks to reduce outlet BOD*
4. *Package septic tanks can be used in new construction or in replacing defunct septic tanks*

D. Methods for septic tank cleaning and waste disposal:

1. *Public private partnership should be encouraged for septic tank cleaning and operation of treatment plants.*
2. *Need to mandate cleaning of septic tanks once in two - three years and construct sludge drying bed for treatment of the waste*

E. Support required from the government:

1. *Government should provide appropriate technical and financial support for implementation of schemes*
2. *Subsidy provided by the government should take into consideration regional context.*
3. *A standard design for toilets should be made available to all the urban local bodies of the state.*
4. *Need support in resolving land-ownership related issues.*
5. *Pilot projects should be undertaken to showcase good technologies through government grants*
6. *Many people are habitual to open defecation, and may continue to defecate in open after construction of toilets. Awareness creation programs are required for such groups.*
7. *Need support in levying penalties on persons/households defecating in the open.*
8. *It should be mandated that to avail benefits from other government programs toilet at household level would be required.*

Workshop Experience and Learning:

After the group discussion session, each municipal council representative shared their key takeaways and learning from the workshop. Following were the experiences and learning shared by the ULBs:

Wai Municipal Council shared that, for the Individual and Group Toilet scheme, in addition to the funding options that the ULB is trying to explore with help of CEPT University, they also need to consider the funding that is provided under Swachh Bharat Mission. For regular cleaning of septic tanks, ULBs generally lacks required infrastructure and institutional capacity for which Wai as well as other ULBs should explore options like PPP. New technologies like bio digester and master bio-tank can be explored and tested.




Tumsar, Raver, Chalisgaon and Buldhana Municipal Council shared that they have learnt that individual and group toilets are the ideal solutions to make cities open defecation free. Sindi Municipal Council shared concern over operation and maintenance of group toilets, however they think that wherever citizens face space and affordability constraints, group toilets should be encouraged. They were thankful to know about the innovative DRDO bio digester technology in this workshop and would like to explore it further.

Yawal Municipal Council emphasized that IEC activities are very important to ensure use of the constructed toilets.

The workshop ended with vote of thanks by Mr. Aasim Mansuri from CEPT University and Mr. Sudhir Patondikar from MEETRA. They thanked all the participants for active participation in the workshop and thanked the organizers for organizing the workshop.

Annexure 1: List of Participants:

	Participant	Organization
1	Mr. Yogesh K. Bharadwaj	BharadwajEcotech Nashik
2	Mr. Nishi Kant Rai	BSA Corporation Limited
3	Mr. Vinit T. Patole	Ambernath Municipal Council
4	Mr. Ramchandra Barma Patil	Nisarg Conservation, Nashik
5	Mr. Nilesh Subhash Pawar	Prakash Pawar Associates
6	Mr. Saket Avinash Gosavi	Proprietor, Nashik
7	Mr. Gajanan D. Badarkhe	Buldhana Municipal Council
8	Mr. Vijaya Vithoba Shingane	Buldhana Municipal Council
9	Mr. Ganesh Mohan Lad	Chalisgaon Municipal Council
10	Mr. Sachin Balkrushna Rajbhog	Chalisgaon Municipal Council
11	Mr. Anand Khairnar Gaba	Raver Municipal Council
12	Mr. Prakash Anandrao Chandekar	Sindi Municipal Council
13	Mr. Jayant K. Kamble	Sindi Municipal Council
14	Mr. Ranvindra Vitthal Deshmukh	Sinnar Municipal Council
15	Mr. Sunil Shivaji Patil	Sinnar Municipal Council
16	Mr. Nitin Parchanda Pardeshi	Sinnar Municipal Council
17	Ms. Asha Tukaram Kangare	Sinnar Municipal Council
18	Mr. Ashok R. Satpute	Tumsar Municipal Council
19	Mr. Jagdish Baliram Thakre	Tumsar Municipal Council
20	Mr. Rajendra V. Gaikwad	Wai Municipal Council
21	Mr. Avinash R. Ranjane	Wai Municipal Council
22	Mr. Jagtap Nitin Mahadev	Wai Municipal Council
23	Mr. Manoj Ambadas Kharat	Yawal Municipal Council
24	Mr. P. N. Gokhle	MEETRA
25	Mr. Sudhir R. Patodikar	MEETRA
27	Ms. Utkarsha Kavadi	AIILSG / CEPT University
29	Mr. Dhruv Bhavsar	CEPT University
26	Mr. Aasim Mansuri	CEPT University
28	Ms. Pallavi Palsokar	AIILSG / CEPT University
30	Mr. Manojkumar Valvi	URCON Consultants

Annexure 2: Agenda

CEPT University
All India Institute of Local Self Government (AIILSG)
and
Maharashtra Environmental Engineering, Training & Research Academy (MEETRA), Nashik

Swachh Nagar–Making toilets and septic tanks work
February 21, 2015

Objective: In recent months, Sanitation agenda has been at the forefront of development agenda in India. The Government of India has launched Swachh Bharat Mission with an aim to make the whole country Open Defecation Free (ODF) by 2019. For this target to be achieved at local level, the ULBs and other stakeholders need to have adequate knowledge and capacity.

This workshop is organized to develop capacity of municipal staff and local contractors regarding various design norms and regulations related to toilet and septic tank construction. The workshop will also share ideas on how to make cities open defecation free city in line with the Swachh Bharat Mission guidelines. The participants would also be apprised regarding new technological developments in toilet technology.

Participants: From ULB - City engineer / junior engineer/ Sanitary Inspector/ Technical Assistant; from Private sector: local construction contractors

Time	Topic	Remarks
10.00 to 10.30	Registration	
10.30 to 10.45	Welcome Remarks	CEPT, MEETRA, AIILSG
10.45 to 11.00	Swachh Nagar – Making toilets and septic tanks work	CEPT
11.00 to 11.30	Presentation on Universalizing access to toilets through own toilet scheme - A case of Wai and Sinnar	AIILSG/CEPT
11.30 to 14.00	Presentation on Septic tank concept and design	Mr. Yogesh Bharadwaj (MEETRA)
	Presentation on Septage management	Mr. P.N. Gokhle (MEETRA)
	Presentation on Bio - Sanitizer	Mr. Yogesh Bharadwaj (MEETRA)
14.00 to 15.00	Lunch	
15.00 to 15.30	DRDO Toilet technology	Mr. Nishikant Rai (BSA Corporation)
15.30 to 16.30	Group work	Participants will discuss issues related to toilet construction, septic tanks construction, effective technologies, the nature of support required from Government and financial institutions
16.30 to 17.00	Presentation by groups	
17.00 to 17.15	Wrap up and closing remarks	MEETRA/CEPT/AIILSG

The Performance Assessment System (PAS) Project

The Performance Assessment System – (PAS) is an action research programme, initiated by the CEPT University, Ahmedabad, with funding from the Bill and Melinda Gates Foundation. Since 2009, PAS has supported development of tools, methods and processes for performance assessment and improvement in delivery of urban water and sanitation services. It works with all levels of government: national, state and local. Since 2009, the PAS online performance assessment system has been implemented in the states of Gujarat and Maharashtra covering more than 400 cities. Other states in India have also begun to implement this system. The PAS programme has developed performance improvement tools to assist urban local governments in planning, target setting and tariff determination.

In recent years PAS programme has focused its work on urban sanitation. It has developed indicators for measuring on-site sanitation, developed framework for citywide sanitation planning considering the full value chain, and supported cities in implementing city sanitation plans that focus on making cities open defecation free (ODF). In support of these efforts, PAS team is working with various agencies on developing innovative sanitation financing mechanisms.

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