



## Environment

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## Water Community



# Solution Exchange for the Water Community Consolidated Reply

## *Query: Ecological Sanitation - Examples; Experiences*

Compiled by Pankaj Kumar S., Resource Person and Ramya Gopalan, Research Associate  
30 June 2007

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**From S. Janakarajan, Madras Institute of Development Studies (MIDS)  
Chennai**

**Posted 5 June 2007**

I work with the Madras Institute of Development Studies (MIDS) in Chennai.

In recent years, there is a growing emphasis on promoting Ecological Sanitation (ecosan) due to a number of factors:

1. Wider realisation that modern sewage-based sanitation uses up a tremendous amount of drinking water quality water for flushing, and requires large costly plants for treatment.
2. Mixing of faeces and urine makes treatment difficult, as both these need different treatments.
3. Wastage of urine and faeces, which could be a rich source of fertiliser. Proper management of these will reduce treatment as well as fertilizer costs.

A number of practices have been identified for Ecological sanitation such as Urine separation, composting toilets, waste water gardens, etc. The three-step process for dealing with human excreta on the basis of Ecosan are : (1) Containment, (2) Sanitization, (3) Recycling. See [http://en.wikipedia.org/wiki/Ecological\\_sanitation](http://en.wikipedia.org/wiki/Ecological_sanitation) and other Eco-san websites for details.

Thus, Eco-San appears to be a good concept, and is being used in a few villages in India. However, the failure rates of implementing eco-san are reported to be very high.

In this context, I would be interested to know from members :

- Members experiences in implementing Eco-san toilets.
- Examples and learnings from places where eco-san toilets have been in sustained use, say for more than two years any where in India?

Members' inputs will help all of us in understanding the issues involved in wider replication of Eco-san toilets, and would be greatly appreciated.

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## Responses were received with thanks from

1. [S. Vishwanath](#), Rainwaterclub & Arghyam Trust, Bangalore
2. [Latha Bhaskar](#), Communication & Capacity Development Unit (CCDU) Kerala, Trivandrum
3. [Alpana Mukherjee](#), ADOPT, Dehradun
4. [Madhab Nayak](#), Fountain of Development Research and Action (FODRA), New Delhi
5. [S. Damodaran](#), WaterPartners International India Liaison Office, Tiruchirappalli, Tamil Nadu
6. [K.Y. Babu](#), UNICEF, Nagapattinam, Tamil Nadu
7. [Kumar Alok](#), UNICEF, New Delhi
8. [Mrinalinee Vanarase](#), IORA for Environmental Solutions, Pune
9. [Ravi Kant Sinha](#), Department of Drinking Water Supply, Ministry of Rural Development, New Delhi
10. [Sunita Nadhamuni](#), Arghyam, Bangalore
11. Bhawna Vajpai, Spatial Decisions, New Delhi ([Response 1](#); [Response 2](#))

*Further contributions are welcome!*

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## Summary of Responses

The query asked members' experiences in promotion of ecosan in various parts of India, in response to which members shared their understanding, analysed current problems and gave a number of suggestions for scaling up the same.

Listing the **benefits of ecosan**, members agreed that it was an eco-friendly, sustainable method of management of human excreta and urine, with additional benefits for the agricultural sector as it produced good organic fertilizer leading to richer soils. It also treated faeces effectively, thus ensuring better public health and protected aquifers. They asserted that ecosan was especially suitable in areas with a high water table, hard rock/ soil and water scarcity as it did not require digging a deep pit, and needed very little water for maintenance. It was also most suitable in areas where open defecation sites were not available easily, and quoted an example from the banks of river Cauvery in [Kaliapalayam Village, Tamil Nadu](#), where ecosan toilets were doing very well. Their clean, low-maintenance nature was most appealing to a number of users, and reduced drudgery of women in fetching water. Ecosan toilets were excellent for resolving second generation issues in sanitation, which our society was currently facing, added respondents.

The group listed a number of **experiences of promoting ecosan** in India. While Arghyam promoted ecosan toilets in [Karnataka](#) with some partner NGOs, Eco-solutions had been promoting the same in [Kerala](#) and [Uttarakhand](#). [SCOPE](#), an NGO used ecosan toilets successfully in tsunami-affected areas of Nagapattinam, [Kameswaram Village, Tamil Nadu](#). Respondents also mentioned that Government of India had started promoting ecosan under the [Total Sanitation Campaign](#), as had [UNICEF](#) in its programmes. Ecosan based community urinals have been tried in Tamil Nadu and Maharashtra, and linkages for urine use in agriculture were being developed. [FODRA](#), an NGO from [Delhi](#) had experimented with cement pans for ecosan, which had not worked very well, and was now using ceramic pans. One cycle of human excreta based composting has been completed by this NGO, and it is now collaborating with a school to collect urine for fertilizers. In almost all places where ecosan has been promoted, the performance is good, and the demand for such toilets has been rapidly rising, reported members.

Discussing the **problems in promoting ecosan**, respondents felt that users who have been used to pit or septic type of toilets found ecosan to fall out of their comfort zone, and therefore difficult to switch to. In this context they mentioned a [case](#) where an ecosan owner had to switch back to twin pit leach system as he was not able to convince his relatives of its value. Apart from its higher costs, and need for larger space, discussants also mentioned that promotion of ecosan has not yet reached a critical mass, due to which trained masons, technology (such as pans) and government schemes for the same are not available yet. Similarly, so far ecosan has been more popular in rural areas because it is easier to complete the cycle of recycling of nutrients here, than in urban areas, where there were space limitations and logistical problems in collection and utilization of urine and compost. Moreover, the initial experiments in ecosan promotion have been targeted at the poorest populations so far.

A number of **suggestions for ecosan promotion** emerged from the discussion. Participants felt that exposure visits to places where people were actually using ecosan toilets was the best way to promote ecosan. Additionally, respondents suggested that along with developing a critical mass of ecosan toilets to ensure lower production costs, strategies for its promotion among non-rural and non-poor populations also need to be devised. Ecosan needs to be integrated into more government programmes, and research and development into its promotion in different climatic and soil conditions is needed, as ecosan may not be suitable for all areas. Discussants suggested that initiatives of using public urinals to produce urine as a fertiliser could be scaled up, and policy makers, city planners, architects, civil engineers could be sensitized towards ecosan. Moreover, training of masons was most urgently required if ecosan is to be scaled up, as members pointed out that minute faults in its implementation led to foul smell and poor sanitary conditions, which will make it unpopular. In general, scaling up could also build on the fact that it is easier for people who have not used toilets to move to ecosan, and build on this. Respondents also suggested that detailed user and training manuals could be prepared for ecosan, as another means for its promotion.

The discussion concluded that ecosan is picking up fast and has a good potential in India, and has so far given excellent results wherever adequate capacity building and sensitization of users has been done. Once the technology is standardized and integrated into larger programmes (such as Total Sanitation Campaign), its costs will come down and the teething troubles will go away. As with any new technology, quality control and capacity building in the initial stage of its implementation could ensure that ecosan becomes a technology of the future.

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## Comparative Experiences

### Uttarakhand

**Reluctance in Accepting Ecosan In spite of Varied Benefits, Dehradun Valley** (from [Alpana Mukherjee](#), ADOPT, Dehradun)

ADOPT built very effective toilets in Chharba Village, Sahaspur Block about 3 years back with help from Paul Calvert of [Eco Solutions](#). They are particularly effective in areas with scarce water sources contributing to cleaner rivers, greener cities, use of organic fertilisers, protecting aquifers and rich soils and better public health in both rural and urban settlements. However, people continue to accept the concept with much reluctance.

### New Delhi

From [Madhab Nayak](#), Fountain of Development Research and Action (FODRA), New Delhi

### **Shift from Cement Pans to Ceramic Ecosan Pans**

An ecosan toilet pan (for urine diversion and on-site composting of faeces) was first produced using sand, cement and iron wires and a waterless ecosan toilet unit with 3 seats was constructed in Asalatpur, 10 km away from Delhi border to understand the degree of acceptance by people. People from the village continue to use it. The process observed that cement pans are very difficult to clean. Thus leading to the development of a ceramic ecosan pan

### **Use of Urine Collected from Ecosan Toilets as Fertilisers**

Issues space limitations and logistic problems related to collection and transportation of urine for agriculture use to replace chemical fertiliser preferred Asalatpur over peri-urban Delhi to promote ecosan toilets. One cycle of the onsite composting of faeces was completed and used in the field as soil conditioner. The urine diverted from these units is collected and used in the crop and vegetable. Encouraging results attracted neighbourhood farmers to apply urine as a fertiliser.

### **Replacing Urea with Urine in Private Schools**

[FODRA](#) collaborated with a private school for urine collection. Slight modifications were made to the existing toilet system to use collected urine in agriculture as per usage guidelines. FODRA experimented with application of urine to replace urea, and so far the result is positive and encouraging thus indicating that ecosan toilets can be easily promoted in rural pockets under various government sponsored sanitation programmes.

## **Tamil Nadu**

### **Ecosan Activities in Rural and Coastal Areas, Kaliapalayam Village** (from [S. Damodaran](#), *WaterPartners International India Liaison Office, Tiruchirappalli, Tamil Nadu*)

[SCOPE](#) promotes eco-san activities in the areas of Nagapattinam tsunami affected villages and constructed 18 eco-san toilets 3 years ago. The toilets are used and maintained by villagers and the village is now open-defecation-free. Based on this first success, SCOPE further extended 120 toilets to nearby Sevanthilingapuram village and then in Kameswaram village constructing. Community involvement and campaign efforts to propagate the ecosan idea resulted in success.

### **Educating Users and Motivating Communities towards Ecosan, Kameswaram Village** (from [K.Y. Babu](#), *UNICEF, Nagapattinam, Tamil Nadu*)

[UNICEF](#)/SCOPE implemented ecosan projects constructing over 150 ecosan toilets. Initially one ecosan toilet was constructed demonstrating to beneficiaries and educating users. A mason training program was also conducted. The toilet cost is Rs. 7000-8500 and each beneficiary contributes Rs. 1500-2000. An identified motivator motivates/ educates the community. Impressed with the results, 100 more ecosan toilets are in progress in near by Pudupalli village.

## **Karnataka**

### **Ecosan Toilet Converted to Twin Pit Pour Flush System, Kuruburakunte Village** (from [S. Vishwanath](#), *Rainwaterclub & Arghyam Trust, Bangalore*)

More than two years ago a dry source separating composting ecosan toilet was installed an ecosan and the household recently converted the unit into a twin pit system recently. The family was happy with the eco san but relatives found it difficult to use it and the family could not properly communicate the way to use it to the relatives. The unit therefore started to smell and on complaints from the neighbour had to be converted to a twin pit pour flush system.

### **Ecosan Project focusing on Capacity-Building, Kolar District** (from [Sunita Nadhamuni](#), *Arghyam, Bangalore*)

Still in its early stages this ecosan project by [Myrada](#) emphasizes on local capacity building. Construction work happened only recently, after preparatory work in community-organization, capacity building, exposure and training at the start of the project. The eco-san units function almost perfectly. The community understood the system well saying it is easy to maintain, very convenient, does not require water etc. The project began at 5 units now at 120 due to demand

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## Related Resources

### *Recommended Organizations*

**Arghyam Trust, Bangalore** (from [S. Vishwanath](#), Rainwaterclub & Arghyam Trust, Bangalore)  
2nd Floor, 840, 5th Main (Above Aafreen's Salon), Indiranagar 1st stage, Bangalore – 560038;  
Tel.: +91 80 25210378; Fax: +91 80 25252003; [info@arghyam.org](mailto:info@arghyam.org)  
<http://www.arghyam.org/>

*A major supporter of eco san projects, also interested in documenting the learnings from eco san experiences*

**Eco-Solutions, Kerala** (from [Latha Bhaskar](#), Communication & Capacity Development Unit (CCDU) Kerala, Trivandrum)  
Contact: Paul Calvert; 'Pulari', 49 Asan Nagar, Vallakadavu, Trivandrum – 695008; Tel.: +91 471 2502622, Mobile: +91 9447762473; [paulc@vsnl.com](mailto:paulc@vsnl.com), [paul@eco-solutions.org](mailto:paul@eco-solutions.org);  
<http://www.eco-solutions.org/>

*Designs, demonstrates and promotes ecological sanitation and community development projects involving women, also experiments with technological options for coastal regions*

**ADOPT, Dehradun** (from [Alpana Mukherjee](#))  
606, Ansal Bhawan, 16, Kasturba Gandhi Marg, New Delhi – 110001; Tel.: +91 11 23313771/23326754; Mobile: +91 9871387307; Fax: 91 11 23714193  
<http://www.adoptfoundation.org/sanitation.html>

*Active promoter of Ecosan toilets in the Dehradun Valley focussing on areas of scare waters and hilly terrain*

**Fountain of Development Research and Action (FODRA), New Delhi** (from [Madhab Nayak](#), Fountain of Development Research and Action (FODRA), New Delhi)  
302, Jai Appartments, Sector - 9 Rohini, Delhi – 110085; Tel.: 91 11 27553976; Fax: 91 11 27566715; [fodra@vsnl.com](mailto:fodra@vsnl.com); <http://www.fodra.org/finn.asp?getfl=inov4>

*Promotes ecosan concepts/ approaches in low income settlements, to address ground water contamination, which is the main source (via hand pumps) for drinking water.*

From [S. Damodaran](#), WaterPartners International India Liaison Office, Tiruchirappalli, Tamil Nadu

**Society for Community Organization and People's Education (SCOPE), Tamil Nadu**  
Contact: Mr. Suburam; Trichy - 620003, Tamil Nadu; [scopeagency86@rediffmail.com](mailto:scopeagency86@rediffmail.com), [scopeagency86@sify.com](mailto:scopeagency86@sify.com)  
<http://www.scopetrichy.com/>

*Promotes ecosan compost toilets design and construction, helping the recovery of urine and faeces to improve farm production, prevent water contamination and save water.*

### **Gramalaya, Tamil Nadu**

Contact: J. Geetha, Executive Director; 12, 4th Cross, Thillainagar West, Tiruchirappalli – 620018;  
Fax: +91 431 4021563/4220263; Mobile: +91 9443161263; [gramalaya@airtelbroadband.in](mailto:gramalaya@airtelbroadband.in);  
[gramalaya@hotmail.com](mailto:gramalaya@hotmail.com); <http://www.gramalaya.org/sanitisedslums.html>

*Promoted water and sanitation activities in Tiruchirapalli District, received 10 NGP awards for its areas of operation and actively promotes ecosan projects*

**UNICEF, Chennai** (from [K.Y. Babu](#), UNICEF, Nagapattinam, Tamil Nadu)

Contact: Dr. Vijayanthi, APO, WES; 2 Chittaranjan Road, Teynampet, Chennai - 600 018, Tamil Nadu; Tel.: +91 44 24350332/24353437/24344051/24364635; Fax: +91 44 24343342; [chennai@unicef.org](mailto:chennai@unicef.org); <http://www.unicef.org/india/wes.html>

*Engaged in promoting sanitation services and particularly recommended for information regarding the functioning eco-san toilets in Tsunami-affected villages, Tamil Nadu*

**Myrada, Bangalore** (from [Sunita Nadhamuni](#), Arghyam, Bangalore)

No. 2, Service Road, Domlur Layout, Bangalore 560 071; +91 80 25352028/25353166/25354457; Fax: +91 80 25350982; [myrada@vsnl.com](mailto:myrada@vsnl.com); <http://www.myrada.org/index.html>

*Promotes ecosan projects in districts of Karnataka, Tamil Nadu and Andhra Pradesh by forming SHGs, building community capacity and partnering with other NGOs*

### **Total Sanitation Campaign**

Department of Drinking Water Supply, Ministry of Rural Development, Government of India  
[http://ddws.gov.in/tsc-nic/html/tsc\\_online\\_form.htm](http://ddws.gov.in/tsc-nic/html/tsc_online_form.htm)

*Links to online NGP application form, action plan template for SSHE and the Total Sanitation Campaign review format*

### **Recommended Documentation**

**Rainwater-Rice on the Roof** (from [S. Vishwanath](#), Rainwaterclub & Arghyam Trust, Bangalore)

<http://youtube.com/watch?v=xeE-BzCr8Gs>

*Video explains how urine from source separating composting toilet of the squatting type is used for growing paddy on the roof along with grey water and bath water.*

**Eco-Housing Assessment Criteria Finalized for Pune** (from [Mrinalinee Vanarase](#), IORA for Environmental Solutions, Pune)

Eco-Housing India

<http://www.ecohousingindia.org/index.php?option=content&task=view&id=26&Itemid=26>

*Represents eco-friendly, energy efficient buildings, sustainable construction practices, and a healthy and productive indoor environment with lowered use of natural resources*

From [Pankaj Kumar S.](#), Resource Person

### **Ecologically Mindless**

Sunita Narain and **Manoj Nadkarni** ; Down to Earth; February 28, 2002

Click [here](#) to read PDF (Size: 182 KB)

*Article on how the flush toilet system and the sewage system are an environmental problem and not the solution and examines other sanitation methods*

### **Re-Use Of Ecological Sanitation Products in Tropical Agriculture to Enhance Crop Production and Mitigate Soil Degradation**

RESPTA, University of Hohenheim; June 6, 2007

<http://www.uni-hohenheim.de/respta/>

*Note on ecological sanitation an alternative method of human excreta and domestic wastewater disposal, that seeks to avoid environmental pollution and hygienic hazards*

### **What is Ecosan?**

Petter Jenssen and Razak Seidu; Norwegian University of Life Sciences; Aril 30, 2007

<http://www.umb.no/22370>

*Note explaining ecosan as engineering for wastewater treatment or ecological sanitation that applies ecological thinking to the design and implementation of wastewater treatment systems*

### **Eco-san**

Wikipedia; September 27, 2006

<http://en.wikipedia.org/wiki/Eco-san>

*Encyclopaedia article defining ecological sanitation as seeking ways to address the issues of modern sanitation systems, which are environmentally destructive*

### **Ecological Sanitation**

Wikipedia; April 18, 2007

[http://en.wikipedia.org/wiki/Ecological\\_sanitation](http://en.wikipedia.org/wiki/Ecological_sanitation)

*Encyclopaedia article explaining eco-san as a 3-step process dealing with human excreta: containment, sanitization, and recycling to protect human health and the environment*

### **Ecological Sanitation—A Way To Solve Global Sanitation Problems?**

Gunter Langergraber and Elke Muelleggerab; Environment International; October 13, 2007

[http://www.ecosan.at/download/gl\\_el\\_2005\\_envInt31\(3\)433-44.pdf](http://www.ecosan.at/download/gl_el_2005_envInt31(3)433-44.pdf) (Size: 768 KB)

*Article argues with population growth conventional sanitation concepts, based on flush toilets, a water wasting technology, are neither an ecological nor economical solutions*

### **Ecological Sanitation Festival Under Way**

K. Subramanian; The Hindu; June 10, 2007

<http://www.hindu.com/2007/06/10/stories/2007061007980300.htm>

*Article on a weeklong ecological sanitation festival in the tsunami-hit Kameshwaram in Nagapattinam district to mark construction of the 250 `ecosan' toilets in the village*

### **Reasons For and Principles of Ecological Sanitation**

Christine Werner, Papa Abdoulaye Fall, Jana Schlick, and Heinz-Peter Mang; GTZ ecosan project Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ); April 2003

<http://www.gtz.de/de/dokumente/en-ecosan-reasons-and-principles-2004.pdf> (Size: 2.36 MB)

*Paper argues to achieve the Millennium Development Goals and Johannesburg Plan of Implementation, holistic sanitation concepts are needed, focussing on economically feasible*

### **Ecosan: India's First Eco-Sanitary Mart Opens in Kerala**

IRC International Water and Sanitation Centre (IRC); December 16, 2005

<http://www.irc.nl/page/27446>

*Article on Eco-solutions opening India's first Ecological Sanitaryware Mart in Trivandrum District, designed to be a focal point for ecological sanitation (ecosan) work in the area*

From [Ramya Gopalan](#), Research Associate

### **Toilets That Make Compost**

Peter Morgan, Aquamor: Harare, Zimbabwe, EcoSanRes Programme, Stockholm Environment Institute, 2007

[http://www.ecosanres.org/pdf\\_files/ToiletsThatMakeCompost.pdf](http://www.ecosanres.org/pdf_files/ToiletsThatMakeCompost.pdf) (Size: 6.50 MB)

*Details low-cost, sanitary toilets that produce valuable compost for crops in an African context*

## **Ecological Sanitation**

Paul Calvert *et al.*, Stockholm Environment Institute, Stockholm, 2004

[http://www.ecosanres.org/pdf\\_files/Ecological\\_Sanitation\\_2004.pdf](http://www.ecosanres.org/pdf_files/Ecological_Sanitation_2004.pdf) (Size: 1.2 MB)

*Presents the findings of over ten years of research and development in ecological sanitation citing ideas and experiences from different countries*

## **Ecological Sanitation Closes the Loop between Sanitation and Agriculture**

GTZ

<http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/8524.htm>

*Recognizes ecosan as a new paradigm which treats human excreta and water from households not as waste but as resources recovered, and safely used in agriculture*

## **Recommended Portals and Information Bases**

From [Pankaj Kumar S.](#), Resource Person

## **Ecological Sanitation, Energy and Environment, Water Governance, UNDP**

<http://www.undp.org/water/initiatives/ecol.html>

*Portal lists information on UNDP's ecological sanitation project and contains links to documents and other material on ecological sanitation*

## **EcoSan**

<http://www.ecosanres.org/>

*Focuses on Ecosan especially in urban areas and provides information on the technical, financial, environmental, health, socio-cultural, institutional, political and legal aspects*

## **Sanitation Connection: Frequently Asked Questions**

<http://www.sanicon.net/faq.php3>

*Portals lists initiatives and projects involved in ecological sanitation across various countries*

## **World Toilet Day (WTD)**

<http://www.worldtoilet.org/>

*contains materials related to improving toilet standards and provides a platform for toilet associations, related organizations and individuals to exchange ideas on sanitation issues*

## **WHO: Guidelines for the Safe Use of Wastewater, Excreta and Greywater**

[http://www.who.int/water\\_sanitation\\_health/wastewater/gsuww/en/index.html](http://www.who.int/water_sanitation_health/wastewater/gsuww/en/index.html)

*Portal contains the third edition of the Guidelines and a series of background papers on the issue of sanitation*

## **International Water Association Ecological Sanitation Specialists Group**

<http://www.ecosan.org/>

*Has material and links on sanitation systems permitting nutrient reuse, mainly by source separation, from high- over medium- to low-tech and central solutions*

## **Recommended Contacts and Experts**

From Bhawna Vajpai, Spatial Decisions, New Delhi; [response 1](#)

**Mr. Håkan Jönsson, Stockholm Environment Institute, Sweden**

Email: [hakan.jonsson@bt.slu.se](mailto:hakan.jonsson@bt.slu.se)

*Recommended for his work on ecosan and related issues*

**Ms. Sridevi, Bangalore Agriculture University, Bangalore**

Email: [sri233011@yahoo.com](mailto:sri233011@yahoo.com)

*Recommended for her recent research work on the use of urine and excreta on crops and the need to promote ecosan toilets in this regard*

### ***Recommended Networks and Communities***

**EcoSanRes Discussion Group** (from [Pankaj Kumar S.](#), Resource Person)

<http://tech.groups.yahoo.com/group/ecosanres/>

To subscribe [ecosanres-subscribe@yahoogroups.com](mailto:ecosanres-subscribe@yahoogroups.com)

*Closed discussion group for professionals working within the area of ecological sanitation, objective is cover news and topics of interest relevant to the EcoSanRes programme*

### ***Recommended Trainings***

**2007/2008 International Training Programme (ITP) in Ecological Sanitation, Sweden**

Contact: Cecilia Ruben; The EcoSanRes Programme at Stockholm Environment Institute (SEI);

Kräftriket 2B, SE-106 91 Stockholm, Sweden; [cecilia.ruben@sei.se](mailto:cecilia.ruben@sei.se);

<http://www.ecosanres.org/ITP2007.htm>

*Program on ecological sanitation focuses on sanitation solutions for urban and peri-urban areas to promote health, enhance human dignity, improve nutritional status and protect water sources*

### ***Related Past Consolidated Replies***

**[Low cost and ecologically sound sanitation practices](#)**, from Dinesh Kumar, IWMI, Anand (Comparative Experience). Issued 3 October 2005

*Identifies low-cost, ecologically sound sanitation practices for urban and rural areas, and experiences in adopting these methods*

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## **Responses in Full**

**[S. Vishwanath](#), Rainwaterclub & Arghyam Trust, Bangalore**

A little bit of experience with ecosan:

1. We have a system installed on the first floor and it is working very well since the last 3 years. It is a source separating composting toilet of the squatting type and the urine is used for growing paddy on the roof along with grey water from the washing machine and bath water. (<http://youtube.com/watch?v=xeE-BzCr8Gs>)

2. There are three more systems installed in urban homes for over two years and they are all working well.

3. A loose consortium of NGO partners (Total Sanitation Campaign, UNICEF, CART, Waste wise, Parisara Pragna kendra, MYRADA, Nirmithi Kendras, Arghyam, Rainwater Club among others) have been implementing eco san units in rural areas of Karnataka. MYRADA has taken the lead in two villages with more than 60 houses each having ecosan. There are over 250 eco san units

now in various parts of Karnataka. These are however recent and one has to observe their performance over time.

4. In a village Kuruburakunte close to Bangalore where we installed an ecosan, which was a dry source separating composting toilet, more than 2 years ago, the unit has been converted by the household into a twin pit system recently. The family was happy with the eco san but relatives found it difficult to use and the family could not talk to the relatives to use it properly. The unit therefore started to smell and on complaints from the neighbour had to be converted to a twin pit pour flush system.

5. It is important to realise, in my opinion, that eco san is a process and not a system to be associated with source separating composting toilet alone. The twin leach pit if properly designed and used is also eco-san.

6. It is in high water table area (where Paul Calvert does remarkable work) or in hard rock area that eco san as a source separating composting toilet makes the most sense. The targeting of the area is crucial for success of eco san as source separating composting toilet.

7. A student -Sridevi- is doing her Ph.D. on the application of urine on crops as part of the eco san work here in the Gandhi Krishi Vigyan Kendra Bangalore under the guidance of Prof Srinivasamurthy. She has completed one and a half year and her study so far shows highly positive results for eco san. She is being supported by Arghyam for her work.

8. ARGHYAM ([www.arghyam.org](http://www.arghyam.org)) is supporting eco san in a big way and is also hugely interested in documenting the learnings from eco san experiences as things go along.

9. Its application in urban areas has been limited and is not a focus. This should change. The target group also remains the poor and this too should change.

It is generally my observation that rural families are happy about eco san and have no problems in handling human waste in a safe way and use its beneficial nutrient qualities. Communication to other users remains a challenge. It is one among the many solutions necessary for India.

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**Latha Bhaskar, Communication & Capacity Development Unit (CCDU) Kerala, Trivandrum**

Inviting your attention to the eco san experience, I would like to share some experimentation in the coastal region of Kerala, initiated by Mr. Paul Calvert. Kindly refer to [www.eco-solutions.org](http://www.eco-solutions.org) for technical details of this model. In Pulluvila, Trivandrum coastal region some viable models can be observed. But there is strong motivational push from the part of the implementing agency, which makes it viable.

As a technically viable option, this model is said to be effective, but it does not fall within the comfort zone of the user which makes it unpopular. Through appropriate R & D appropriate models more feasible and acceptable to the user communities need to be worked out.

In high water table areas, water logged areas and even in water scarce areas, eco san is an alternate model. It is sure to resolve many of our second-generation sanitation issues and water quality problems. However, concentrated efforts of all concerned to develop sustainable models of user acceptance is the only solution to address such issues.

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**Alpana Mukherjee, ADOPT, Dehradun**

Our organization works for the last 7 years in Dehradun valley of Uttarakhand. We built some Ecosan toilets in our village Chharba, in Sahaspur block about 3 years back with help from Paul Calvert from Eco Solution and these are very effective. However, people are still reluctant to accept the concept. For areas where water is scarce, these toilets would be very effective. Ecosan is beneficial for rural and urban settlements – leading to cleaner rivers, greener cities, organic fertilizer, better public health, protected aquifers, richer soils.

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**Madhab Nayak, Fountain of Development Research and Action (FODRA), New Delhi**

I would like to share our experience on promoting ecological sanitation in peri-urban Delhi. Fountain of Development Research and Action (FODRA) has been engaged in promoting ecological sanitation concepts and approaches in low income settlements, primarily to address problems of ground water contamination which has been the main source (through hand pumps) for drinking water. The action research initiative has been with following focuses

- How to change the sanitation habits and attitudes of people and use of recycled human excreta as nutrient in agriculture;
- How to address logistic and other related issues to make the system user friendly in space constraint dwelling units; and
- How to develop a user friendly ecosan pan by diverting and urine and faeces at source.

An ecosan toilet pan (for urine diversion and on-site composting of faeces) was first produced using sand, cement and iron wires and a waterless ecosan toilet unit with 3 seats was constructed in Asalatpur, 10 km away from Delhi border to understand the degree of acceptance by people. People from the village are still using this ecosan toilet. In the process, it was observed that cement pans are very difficult to clean. Accordingly, a ceramic ecosan pan has developed and a few samples have been produced by FODRA. The main reason for not constructing the ecosan toilets in the peri-urban Delhi has been space limitation and logistic problems related to collection and transportation of urine for agriculture use to replace chemical fertiliser. One cycle of the onsite composting of faeces has been completed and used in the field as soil conditioner. The urine diverted from these units is collected and has been used in the crop and vegetable. The result has been very encouraging, which has attracted the attention of neighbourhood farmers towards application of urine as fertiliser.

At same time FODRA has collaborated with a private school for urine collection through slight modification to the existing toilet system to use the collected urine in agriculture as per usage guidelines. FODRA has been experimenting with application of urine to replace urea, and so far the result has been very positive and encouraging. Hence we feel that ecosan toilets can be easily promoted in rural pockets under various government sponsored sanitation programmes.

However, we are unsure about any danger of contamination of the food chain resulting from use of urine or from compost out of human faeces. We request members to please give inputs on whether this should be a concern, and whether we need to test for such contamination in any way.

For more details on specific questions, contact us

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**S. Damodaran, WaterPartners International India Liaison Office, Tiruchirappalli, Tamil Nadu**

Eco-san toilets are considered to be the best option for coastal regions, water logging areas and rocky places.

SCOPE NGO in Tiruchirappalli District of Tamil Nadu is promoting eco-san activities in the rural and coastal areas of Nagapattinam tsunami affected villages. I have personally visited the Kaliapalayam village about 30 km. from Tiruchi City to see the appropriateness of eco-san for water logging areas. This village is close to the River Cauvery where people have no open defecation sites. They need to cross the Tiruchi-Bangalore highway and were using the roadside for open defecation. Sometimes, they need to cross the neck deep water in the agricultural lands to get a safe place for open defecation. SCOPE has constructed 18 eco-san toilets in this village three years ago. The toilets are used and maintained by the villagers without difficulties. One cannot believe that these toilets are really used by the people as there were no smells though it is not a flush out design with water seal. If you want to check the usage you need to use a torch light to find faeces covered with ashes into the drop hole. The interesting fact is that the people in this village are very happily showing the toilets to the visitors with proud.

Based on the first successful intervention in this village, SCOPE has extended further 120 toilets to the nearby village Sevanthilingapuram. If you happen to travel in the Tiruchi-Bangalore road, you can see the eco-san toilets with cement hollow block superstructures. When you reach, Musiri town on the same highway, you can find two community eco-san toilets which are under field testing by SCOPE NGO. In the Musiri town panchayat, there were 200 eco-san household toilets are constructed by SCOPE with funds from WASTE, Netherlands and other collaborating agencies.

SCOPE extended the eco-san toilet concept too to the tsunami affected areas of Nagapattinam in Kameswaram village. Gramalaya, another NGO working in some of the tsunami affected villages of Nagapattinam constructed 10 such eco-san toilets with the design learnt from SCOPE. Among the fishermen communities, the concept is well accepted where people are using the toilets and maintaining it.

SCOPE is taking lot of campaign efforts to propagate the idea of eco-san, though originally the concept was learnt from Paul Calvert from Kerala and from the book published by Duncan Mara. If you want to see the eco-san models just that of you might have seen in the books with urine separation pot, two drop holes with two chambers for composting with plants near the eco-san toilet, you must visit Tiruchi where SCOPE is doing lot of works in eco-san.

For more information on eco-san, kindly visit : [www.scopetrichy.com](http://www.scopetrichy.com)

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#### **K.Y. Babu, UNICEF, Nagapattinam, Tamil Nadu**

I am working with UNICEF, Nagapattinam. We are implementing Ecosan projects through SCOPE a Trichy based NGO pioneering in ecosan in India. We have constructed more than 150 ecosan toilets in Kameswaram village and another 100 is in progress.

For the past four months ecosan toilets in Kameswaram are working perfectly with out any problems. Presently 5 chambers are filled and we are planning to organise a chamber opening function in the presence of Government officials and interested persons like you. We will inform you later in this regard.

Following is the process of implementation:

1. Initially we constructed one demonstration ecosan toilet in the house of a woman belonging to an SHG (Shanthi Mathiselvan, who has now emerged as Vice-President of the Village Panchayat) after proper IEC and intensive campaigns.
2. The beneficiaries (50-60) visited Kaliyampalayam village of Trichy, where SCOPE has constructed earlier. A chamber was opened in front of the beneficiaries and they were educated by ecosan toilet users for better understanding about ecosan.
3. We have constructed toilet in collaboration with other Funding partners like FIN- a france based NGO, DRDA, and UNICEF.
4. Conducted a Mason training programme by UNICEF/SCOPE
5. The approximate cost for each toilet is Rs. 7000- 8500
6. Every beneficiary of the ecosan contributed Rs.1500-2100 as beneficiary contribution.
7. A motivator has been identified among the community to motivate and educate the community.
8. Now all the 150 toilets are functioning perfectly, the technology has made impressions on the near by village called Pudupalli and now another 100 ecosan toilets are in progress by REAL-PLAN NGO with the technical support from UNICEF/SCOPE and funded by Plan-international and UNICEF.

For more information about ecosan you may please contact Dr. Vijayanthi, APO, WES, UNICEF, Chennai and Mr. Suburam, SCOPE.

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**[Kumar Alok](#), UNICEF, New Delhi**

My reply to the questions raised by Pankaj is given below:

*1. Do we think Ecosan toilets, in spite of the many benefits that we have all talked about, are culturally unsuitable in the Indian context ?*

The experience of using toilet linked biogas plant is not bad everywhere.

In the Indian context, definitely people had reservations about using biogas generated from excreta but slowly this problem is reducing. Dr Mapuskar has promoted a large number of such toilets in and around Pune district.

Also, I don't think that ecosan toilets are culturally unsuitable. In a country where a vast majority do not use a toilet for defecation, drawing such a conclusion is not proper. I have a firm belief that those who are adopting the toilet for the first time are open to any technology, but those who have already used leach pit s or septic toilets may face some difficulty in shifting to ecosan.

*2. Government/ Policy support to Ecosan appears to be miniscule.*

As far as my experience is concerned, I don't see any government programme which promotes septic tank. It is definitely not in rural areas, but even in urban areas under the Integrated Low Cost Sanitation Schemes (ILCS), leach pit toilets of Sulabh model were promoted. So Pankaj, I feel that part of the statement in the query is wrong.

As far as TSC is concerned, it includes ecosan as an option and modest efforts have been made. But the real challenge is that the cost of Ecosan toilet is more than the leach pit toilets. Since subsidy in TSC is linked to income status and not to the type of technology, the acceleration is slow. But I feel that the real barrier is due to lack of trained masons at village level. Ecosan being a new concept, very few masons are aware of it and are capable of constructing such toilets whereas most of the masons in rural or urban areas are now aware of septic tank or leach pit technology. So I feel that we must expand the capacity to build such toilets at the village level.

This will automatically give a boost to Ecosan which is a viable alternative and in many cases the only alternative.

*3. Demonstration of Eco-san approach had not reached a critical mass yet for it to be mainstreamed into conventional sanitation programmes.*

It is true that Ecosan approach has not reached a critical mass in India. Just a beginning has been made. But I feel that its growth rate is quite high and very soon it will be recognized as a viable technology. Earlier work was done only in Tamil Nadu and Kerala, but now ECOSAN projects are going on in Karnataka, Maharashtra, Bihar, Jharkhand, etc. also and there is good response from the people. UNICEF and Government of India both are now promoting ECOSAN technology.

I see great potential for ECOSAN community urinals which have already been set up in Tamil Nadu and Karnataka. The urine collected can be used in the field and the problem of poor sanitation due to urination in the open can be tackled. Such urinals may even become commercially viable if the entire urine is used as fertilizer. So back-end linkages with agriculture sector are required. At UNICEF, we are already in touch with MANAGE of agriculture ministry for this purpose.

I personally believe that ecosan technology has a very bright future in India.

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**Mrinalinee Vanarase, IORA for Environmental Solutions, Pune**

This is with reference to Pankaj's mail. I think he has pointed out the basic and most critical problems in Eco-san promotion and upscaling.

Let us look at cities and villages separately.

The problems in cities are severe due to centralised collection and treatment. Of course, city dwellers can also adopt eco-san systems as Vishwanath has been advocating. However, this needs awareness among policy makers, administrators, service industry and common people. You must have heard about Eco-housing programme in Pune and Mumbai. It is still in its initial stage, but can be a great vehicle to generate awareness and to provide incentives. You can get full information about this programme on the following link:

<http://www.ecohousingindia.org/index.php?option=content&task=view&id=26&Itemid=26>

My organization has participated in this programme for developing criteria on water efficient landscape planning.

Villages need a different treatment. Here, who is passing the message is most important. They need not verbally ask you what have you done to treat your waste or what is your experience (some times they do ask!) but they judge you by your actions on that account. So it is very important for them to know your authority and interest. That gives you a necessary entry point.

Secondly, it is always good to start at a small scale. As has been said, demonstration of a functioning system at reasonable scale is very important. Then it can spread easily. Behavioural or attitudinal change is an ongoing process and it needs great consistency to bring about those changes. I wonder how short terms projects supported by small funds can achieve this purpose. However, many NGOs do work in this fashion of short term projects. This is very dangerous. We need to have long term plans.

I don't know if our civil engineers and architects get any knowledge on eco-san in their curriculum. If they do get it, if the contractors know how to do it, if administrators think this is essential, we will see some changes soon.

Between if and then, there is this word 'education', which we need to focus on as an urgent priority.

This mail contains a little of my experience and examples. Eco-san is not my core work area, but I appreciate its importance, hence this effort.

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**Ravi Kant Sinha, Department of Drinking Water Supply, Ministry of Rural Development, New Delhi**

I would like to point out that the TSC programme of the Rural Development Ministry does not promote septic tanks. The programme is based on demand generation for toilets. Choice of toilets is left to the beneficiary and the wisdom of the local authorities.

I feel that Ecosan toilets are necessary, but the premise that it needs to attain critical mass implies that it is the only solution. I feel that because of the costs, this model may not be the only solution across our country. We need to identify areas where such toilets are essential and then work on its promotion in such areas only. Also, if the costs can be reduced by innovations, it may be more acceptable. Along with this aspect, the end use of waste needs to be promoted with proper awareness campaigns. I would be interested in any further suggestions that we can use in modifying the TSC programme itself to promote the Ecosan models.

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**Sunita Nadhamuni, Arghyam, Bangalore**

I visited the ecosan project by Myrada in a couple of villages in Kolar district last week. The project is still in the early stages; the systems have been in use only for a couple of months. So it would be interesting to see this 6 months or a year from now. I'm giving below a few of my observations, which were all very positive, from that visit:

- There was a heavy emphasis on local-capacity building. In the project timeline of 9 months, construction work has happened only in the last 2-3 months, after preparatory work in community-organization, capacity-building, exposure and training at the start of the project.
- The eco-san units have been used for the last couple of months. They are functioning almost perfectly. The community is sold out on them; they say it is easy to maintain, very convenient, doesn't require water, clean, and so on.
- Most of the people we talked to from the community understood the ecosan system well; its usage and maintenance and in some cases, also the importance of using such systems as opposed to the conventional choices. This included children, older women, and men.
- The turning point for them in accepting ecosan was a field visit for 25 community members to H.D. Kote where such systems are in good use. Prior to that, understanding was low, even amongst the Myrada field staff.
- There was also a conventional single-pit toilet built at the same time which didn't look as clean; the women mostly preferred the ecosan for the ease in keeping it clean.

- The project started with just 5 ecosan units, and quickly ramped up to 120 due to the demand.

As others have mentioned, social barriers to using it are probably higher in urban areas than rural. It would be interesting to know what efforts are going on for designing ecosan systems that are easier to handle and use.

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**Bhawna Vajpai, Spatial Decisions, New Delhi (response 1)**

This is with reference to questions raised by Mr. Madhav Nayak regarding danger of contamination of the food by using fertilisers made through ecosan. As far as I know, there are no dangers if we follow available guideline for the use of urine and faeces in Agriculture.

On this, I would suggest contacting Mr. Håkan Jönsson" <[hakan.jonsson@bt.slu.se](mailto:hakan.jonsson@bt.slu.se)> from Stockholm Environment Institute, Sweden, who has done work on Ecosan and this issue.

During my recent visits to Bangalore, I also met Ms. Sridevi ([sri233011@yahoo.com](mailto:sri233011@yahoo.com)) from Bangalore Agriculture University; she has recently done research on use of urine and excreta on crops.

It was nice to know about FODRA's work on Ecosan, and I would like to visit your area if it suits you.

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**Bhawna Vajpai, Spatial Decisions, New Delhi (response 2)**

Being a firm believer in ecological sanitation-'ecosan', and having been trained in the same, I have been reading the postings of members with immense interest. There may be an initial hindrance in practicing ecological sanitation, but I believe that people are open to change when informed properly. My experiences say that it is much easier to motivate people from 'no sanitation to ecological sanitation' in comparison to 'conventional sanitation to ecological sanitation'. Most of the problems encountered during the use of ecosan toilet or similar units - like waterless urinals, wet decomposing, etc - are mainly related to inadequate knowledge about the proper use and maintenance.

I have seen cases in ecosan installations where a minute fault in design defeats the purpose and leads to foul smell and poor sanitary conditions, etc. The introduction of any new technology or installation requires more careful supervision in order to make it work properly. In a few cases of ecosan installations, I have seen that simple building errors can ruin the benefits by making the toilet smelly or difficult to clean. Often these supervisory tasks can be more diligently carried out by users.

There is a need to develop 'User Manuals for Ecosan', comprising a series of important issues like building, maintenance and nutrient reuse process through pictorial presentations. The manual may also contain pictures of wrong and faulty solutions. I am very much interested in any such available document and in giving my technical inputs in any such a proposed document.

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*Many thanks to all who contributed to this query!*

*If you have further information to share on this topic, please send it to the Water Community at [se-wes@solutionexchange-un.net.in](mailto:se-wes@solutionexchange-un.net.in) with the subject heading "Re: [se-watr] Ecological Sanitation - Examples; Experiences. Additional Reply."*

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