



Environment

Water & Environmental Sanitation Network  
(WES-Net India)



## Solution Exchange for WES-Net India Consolidated Reply

*Query: Low cost and ecologically sound sanitation practices/ from  
IWMI Anand/ Comparative Experiences*

Compiled by [Preeti Soni](#), Resource Person and Moderator; additional research provided by  
[Ramya Gopalan](#), Research Associate  
3 October 2005

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**Original Query: Dinesh Kumar, International Water Management Institute  
(IWMI), Anand, Gujarat**

**Posted: 9 September 2005**

I am Dinesh Kumar working at the International Water Management Institute (IWMI) in Anand, Gujarat.

I find that sanitation in rural Gujarat is extremely poor; use of modern toilets very low and open defecation is most common. Given the fact that the dependence on groundwater for drinking in rural areas is extremely high, these could pose serious health problem due to leaching of organic waste. One issue could be affordability. We would be interested in promoting of the low cost sanitation models in some of the villages we are working on groundwater issues in north Gujarat.

In this regard, my query is:

What are the low cost and ecologically sound sanitation practices that are used or recommended in urban and rural areas? What have been your experiences in adopting these methods and technologies?

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### Responses received with thanks from:

1. [D Chandrasekharam](#), Indian Institute of Technology (IIT), Mumbai
2. [Sara Ahmed](#), Indian Institute of Management (IIM), Ahmedabad
3. [A K SenGupta](#), WHO, New Delhi
4. [Nafisa Barot](#), Utthan, Ahmedabad
5. [AJ James](#), Pragmatix India, Gurgaon
6. [Sudarshan Iyengar](#), Centre for Social Studies, Surat
7. [Avani Mohan Singh](#), Haritika, Sangli
8. [Ruchita Khurana](#), Toxics Link, New Delhi
9. [A K Paikaray](#), Mahavir Yuvak Sangh, Bhubaneswar
10. [Suvojit Chattopadhyay](#), Gram Vikas, Berhampur, Orissa

11. Sharadbala Joshi, Loughborough University, Leicestershire\*

\*Offline contribution

*Further contributions are welcome!*

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## Summary of Responses

This query seeking low cost and ecologically sound practices particularly gains relevance in the context of the specific MDG target set for the provision of water supply and sanitation services, to halve the proportion of people without access to safe drinking water and adequate sanitation by 2015. In response, select ecological sanitation models have been identified by members' responses and additional literature.

Ecological sanitation (also called "ecosan") is a cycle, or closed-loop system, which treats human excreta as a resource. Excreta are processed on site until they are free of pathogenic (disease-causing) organisms keeping the eco cycle in the sanitation process closed. It is also a low energy approach using natural processes. It entails the advantages of being economic and flexible. In addition it 1) **eliminates** large quantities of **black water**; 2) **self selects the poor**; 3) **saves domestic water** consumption; 4) enables **recycling** of minerals; 5) facilitates **energy production** from organic waste water resources and 6) also creates **local business opportunities**. Key features of ecological sanitation, therefore, are prevention of pollution and disease caused by human excreta, management of human urine and faeces as resources rather than as waste, recovery and recycling of nutrients, and cost effectiveness of the systems. Members' contributions highlight the following ecological sanitation systems in practice:

- **Systems in Urban and Rural Areas**
  - **Slum networking approach:** Sewers are provided in slums where communities pay for individual household connections and are connected to city-wide infrastructure network. In higher density urban areas, this option reduces possibilities of ground saturation and contamination; and reduces maintenance costs at the household level. An effective structure of tenural rights needs to be in place and serves as an essential prerequisite for the proper functioning of this system. Examples include initiatives in **Indore** and **Ahemdabad**.
  - **Sulabh Sanitation Method:** Low cost, pour flush, water-seal toilet with twin leach pits for on site disposal of human waste. Advantages include affordability, low use of water and the usage of locally available material. Additionally the toilet can never be out of commission as there are twin pits.
- **Wastewater Treatment Systems**
  - **Root Zone Treatment System:** is artificially prepared wetlands comprising of clay or plastic lined excavation and emergent vegetation growing on gravel/sand mixtures. Facilitates treatment of domestic wastewater especially for small towns, villages making it easily possible & affordable with low investment requirements. It is being used in **Auroville, Pondicherry**.
  - **Duckweed Based Wastewater Treatment System** - The duckweed based stabilization pond functions as anaerobic pond except at the top layer where aerobic condition prevails, which hence effectively controls the odour problems of the pond. The capability of up taking nutrients from wastewater attributes this plant to be a biological purifier. This low costing technique is suitable for developing countries as it facilitates resource recovery and environmental protection.

These methods fall under broad contexts in rural and urban areas that have been sourced from additional literature.

- **Dehydrating systems:** In these systems, urine is directed away from faeces to keep the processing chamber dry, volume of material small, and possibly use urine as a fertilizer. Popular examples are:
  - A **Double Vault Dehydrating Toilet**, initiated in **Vietnam**, works to dry the faeces and kill the pathogens prior to its application as a fertilizer in the rice fields. It functions well when used with adequate retention time. Modified versions are used in **China, Central and South America**.
  - A double vault toilet similar to the Vietnamese one has been adapted in coastal regions of **South India**. The vault is lined with straw to allow for decomposition and dehydration of wastes, and requires little maintenance.
- **Composting:** In a composting toilet human wastes are deposited in a processing chamber along with organic household, garden refuse and bulking agents. After sufficient retention time the partly decomposed material is moved for secondary processing. These toilets range from small to larger units, and are used in **Sweden, Norway and Mexico**, and in **Bangalore, India**.
- **Soil Composting:** In this system, soil is added at every level of defaecation in a chamber often with wood ash. It includes shallow pit or raised processing chamber. Soil composting sanitation systems have been predominately used in **Ladakh**, and in **Zimbabwe**.

A variety of such systems and other indigenous technologies are low cost and ecologically sound thus contributing significantly towards achieving the objectives of ecological sanitation. The available technologies and a comparison of experiences and practices are provided in greater detail below.

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## Comparative Experiences

### Systems in Rural Areas

**Orissa**, (from [Sara Ahmed](#), IIM, Ahmedabad)

Gram Vikas is involved in the water and sanitation programme in Orissa wherein the communities bear about 30% of the capital costs, leverage about 50% from the government and Gram Vikas contributes the remaining. The government contribution through the Swajaldhara drinking water supply programme is for establishment of rural piped water supply. Community efforts are also made to tap the local area development funds from local elected representatives. Gram Vikas provides on an average Rs.4,000 per family for construction of toilets and bathing rooms, which is considered as 'social cost' which meets the cost of externally sourced materials including cement, steel, toilet pan, etc.

**Uttar Pradesh** (from [Avani Mohan Singh](#), Haritika, Sangli)

Under the **Swajal Project**, few models in sanitation and provision of drinking water have been developed in the districts of UP to overcome the common problem of open defecation. Particularly in the Bundelkhand region where the soil strata is rocky, low cost twin pit pour flush model of latrines costing around Rs. 3000 have been promoted. Further soak pits, compost pits and CC road with drain for the safe disposal of used water has also been provided.

**Khurda District, Orissa** (from [A.K. Paikaray](#), Mahavir Yuvak Sangh, Bhuvaneshwar)

Under the **Total Sanitation Campaign**, all schools in Khurda District were selected under the district water and sanitation mission headed by the zilla parishad president. Twenty-one school toilet complexes have been built in Begunia Block in five grampanchayats. Individual household latrines have also been promoted. The hindrance faced, however, is the acute water shortage faced in the summer months.

### Systems in Urban Areas

**Indore, Madhya Pradesh** (from [Sharadbala Joshi](#), Loughborough University, Leicestershire\*)

The Department for International Development (DFID) provided significant support for the Slum Networking Project implemented by the Indore Development Authority. The project provided a framework for the integrated upgrading of the entire city within which the slum areas are viewed not as individual settlements but as an urban network. The project also provided for the development of infrastructure thus not just benefiting 4,50,000 slum dwellers but also the entire city. For further information see, [Problems or Opportunities - Towards a better quality of urban life](#)

*From Preeti Soni, Resource Person*

### **Pune, Maharashtra**

A partnership between the municipal government, NGOs and community-based organisations has built more than 400 community toilet blocks greatly improving sanitation for more than half a million people. They have also demonstrated the potential of municipal community partnerships to improve conditions for low-income groups. For further information and other interventions undertaken in the field of sanitation see [SPARC](#) below.

### **Ahmedabad, Gujarat**

Another example of the Slum Networking Project is the ongoing Parivartan Project, which brings infrastructure services including water and sanitation in an affordable and sustainable way to the slums and *Chawls* of the city. This project is led by the Ahmedabad Municipal Corporation (AMC) motivating communities, NGOs and private sector to work in partnership. Its success has resulted in the participation of more slums in the project. For more information, see [Ahmedabad Parivartan](#) below

*From Ramya Gopalan, Research Associate*

### **Bangalore, Karnataka**

A public ecosan toilet block in a slum area in Bangalore provides clean sanitation services at low cost to poor inhabitants. Faeces and urine, collected and treated separately, provide fertiliser for a banana plantation and energy (biogas) for electricity production.

### **Trivandrum, Kerala**

The double vault toilet redesigned by Paul Calvert, [EcoSolutions](#) has been adapted here and is replicated in **Chennai, Tamil Nadu** and **Sri Lanka**. Given the coastal context and high water tables this dry above ground toilet has been successful especially because hygiene education and regular follow up.

### **Ladakh, Jammu and Kashmir**

Experiences in the adoption of **soil composting technique** in dry highland rural regions of Ladakh recommend that it is possible to process human excreta indoors without prior diversion of urine, by using a combination of soil composting and dehydration. During winters soil is piled into a corner available as required. Problems have emerged only recently in the central part of Leh due to the difficulty for households in having access to soil.

## **Waste Water Treatment Systems**

### **Auroville, Pondicherry** (from *Sharadbala Joshi, Loughborough University, Leicestershire\**)

Horizontal planted filters, also called constructed wetlands or **root zone treatment systems** have been developed for recycling domestic wastewater from small individual households, communities and small industrial units producing effluent with similar characteristics to domestic wastewater. At present, [Auroville](#) operates nearly forty treatment systems for recycling domestic wastewater under their decentralized wastewater treatment systems.

### **Kolkata, West Bengal** (from *Ramya Gopalan, Research Associate*)

The Kolkata Wetlands use wastewater both in agriculture and in aquaculture covering an area of about 12,000 ha, known as the Waste Recycling Region. Wastewater-fed aquaculture systems like the Kolkata Wetlands represent controllable public health risks.

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## Related Resources

### Recommended Organizations

**Sulabh International, New Delhi** (from [D Chandrasekharam](#), Indian Institute of Technology (IIT), Mumbai)

<http://www.sulabhtoiletmuseum.org/profile.htm>

*The organization founded by Dr. Bindeshwas Pathak has innovated and promoted a low cost solution to success by the sulabh sanitation method.*

**Safai Vidyalaya (The Environmental Sanitation Institute), Ahmedabad** (from [Sara Ahmed](#), IIM A, Gujarat; [A K Sengupta](#), WHO, New Delhi and [Sudarshan Iyengar](#), Centre for Social Studies, Surat)

Tel: 27557702, 27556247

*The organization has several examples of low cost ecological sanitation models promoted through the "Sanitation Park"*

From [Sara Ahmed](#), IIM, Ahmedabad

**Water and Sanitation Management Organisation (WASMO), Gandhinagar**

<http://www.wasmo.org/eng/swajaldhara.htm>

*Main facilitating organization for the Swajaldhara program, also responsible for fund disbursement under the Total Sanitation Campaign*

**Utthan, Ahmedabad**

<http://www.utthangujarat.org/i3.htm>

*Utthan development action planning team promotes loans for sanitation through women SHGs (San - Banks) in an effort to promote health and sanitation*

**Gram Vikas, Orissa**

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

*Gramvikas is a rural development organization promotes rural sanitation and environmental health covering villages in largely poor, adivasi areas with users contributing to partial costs.*

**Pravah, Ahmedabad**

[pravah@rediffmail.com](mailto:pravah@rediffmail.com); [pravah@icenet.net](mailto:pravah@icenet.net)

*Pravah is working on various options to sanitise the urban slums of Ahmedabad with partner NGOs*

**Water Supply and Sanitation Collaborative Council (WSSCC), Geneva**

<http://www.wsscc.org/home.cfm>

*This organization through its WASH (Water, Sanitation and Hygiene) campaign aims to enable 15 million people reach basic sanitation by 2015 in accordance with the MDGs.*

**Friends of Women's World Banking India** (from [Nafisa Barot](#), Utthan, Ahmedabad)

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

*FWWB was set up in an effort to enable poor women to access financial resources required for business activities. Evidence indicates women accessing low interest loans for sanitation.*

**WASTE, Netherlands** (from [AJ James](#), Pragmatix India, Gurgaon)

[www.waste.nl](http://www.waste.nl)

*An NGO in the Netherlands documenting ecosan practices in different parts of the world*

**Society for the Promotion of Area Resource Centres (SPARC), Bombay** (from [Preeti Soni](#), Resource Person)

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

*Works for development in urban slums including provision of adequate sanitation facilities.*

**EcoSolutions-India, Trivandrum** (from [Ramya Gopalan](#), Research Associate)

<http://www.eco-solutions.org/>

*The organization seeks to design, demonstrate and promote ecological sanitation on the Indian subcontinent since 1994*

### **Recommended Contacts**

From [Sara Ahmed](#), IIM (A), Ahmedabad

**Joe Mediath**, Gram Vikas, Orissa

[info@gramvikas.org](mailto:info@gramvikas.org)

*Recommended as a source for further information on Gram Vikas's initiation to promote rural sanitation and environmental health*

**Nafisa Barot**, South Asia Regional Representative, WSSCC, Geneva

*Recommended for more information on the WASH campaign to be launched by WSSCC*

**Ishwarbhai Patel**, Environmental Sanitation Institute (Safai Vidyalaya), Ahmedabad (from [Sara Ahmed](#), IIM A, Gujarat; [A K Sengupta](#), WHO, New Delhi and [Sudarshan Jyengar](#), Centre for Social Studies, Surat)

[safai@icenet.net](mailto:safai@icenet.net)

*Pioneer of Safai Vidyalaya, recommended for their considerable experience in the field of environmental sanitation*

**Sandeep**, Hunnar Shala, Kutch (from [Nafisa Barot](#), Utthan, Ahmedabad)

*Suggested particularly for the eco sanitation model using less water and solid matter as a fertiliser*

From [AJ James](#), Pragmatix India, Gurgaon

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

*Recommended for more information on the joint working of WASTE and FODRA on eco-sanitation projects in different parts of India.*

**Paul Deverill**, WES - UNICEF, New Delhi

[pdeverill@unicef.org](mailto:pdeverill@unicef.org)

*For more information on eco-san toilets promoted by WES - UNICEF (e.g., in Alwar, Rajasthan)*

**Mark Ellery**, WSP - South Asia, New Delhi and **C.Ajith Kumar**, WSP - South Asia, New Delhi

[mellery@worldbank.org](mailto:mellery@worldbank.org)

[ckumar1@worldbank.org](mailto:ckumar1@worldbank.org)

*Recommended contacts for information on several interesting indigenous technologies being applied in rural Maharashtra*

**Dr. Kamala Choudhury**, Vikram Sarabhai Foundation (from [Ruchita Khurana](#), ToxicsLink, New Delhi)  
*Suggested for expertise in the subject of rural sanitation issues.*

### **Recommended Websites**

**Ecological Sanitation at WASTE** (from [AJ James](#), Pragmatix India, Gurgaon)

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

*Ecological Sanitation site at WASTE, a Dutch NGO. provides information on the various aspects important for the success of ecological sanitation.*

**Ecological Sanitation Links** (From [Ramya Gopalan](#), Research Associate)

[http://www.thewaterpage.com/ecosan\\_links.htm](http://www.thewaterpage.com/ecosan_links.htm)

*This section of the Water Page provides ecological sanitation web links to organizations, publications and resource centers*

### **Recommended Documentation**

**Scaling Up Rural Sanitation in South Asia** (from [Ruchita Khurana](#), ToxicsLink, New Delhi)

Water and Sanitation Program (WSP) Report, May 2004, available at,

[http://www.wsp.org/publications/SANITATION\\_STUDY\\_PRESS.pdf](http://www.wsp.org/publications/SANITATION_STUDY_PRESS.pdf) (size: 1.07 MB)

*The publication cites good case studies from developing countries on sanitation programs reported by WSP - an international partnership for improving the water and sanitation sector*

**Gram Vikas' Intervention in Water and Sanitation** (from [Suvojit Chattopadhyay](#), Gram Vikas, Berhampur, Orissa)

<http://www.solutionexchange-un.net.in/environment/cr/res27090501.doc>

*A short concept note regarding the approach towards water and sanitation adopted by Gram Vikas*

*From Preeti Soni, Resource Person*

**The Soozhal Initiative: A Model for Achieving Total Sanitation in Low-Income Rural Areas**

S. Ramesh Sakthivel and Roger Fitzgerald (2004), Water For All Publication Series, ADB, available at

[http://www.adb.org/Documents/Books/Water\\_for\\_All\\_Series/Water\\_Poverty\\_Realities/Soozhal.pdf](http://www.adb.org/Documents/Books/Water_for_All_Series/Water_Poverty_Realities/Soozhal.pdf) (size: 34 KB)

*This Case Study sets out the experience of a rural sanitation program initiated by Soozhal network in part of the Cuddalore district, Tamil Nadu*

**Ahmedabad Parivartan**

[http://www.citiesalliance.org/citiesalliancehomepage.nsf/Attachments/Cities+Without+Slums+Action+Plan+-+Annex/\\$File/annex.pdf](http://www.citiesalliance.org/citiesalliancehomepage.nsf/Attachments/Cities+Without+Slums+Action+Plan+-+Annex/$File/annex.pdf) (size: 249 KB)

*Summary of a current example of Scaling - Up Slum Upgrading, providing the action plan and the way forward for the Parivartan Project in Ahmedabad*

*Further documentation identified by Ramya Gopalan, Research Associate*

**Problems or Opportunities Towards a better quality of urban life**

<http://envfor.nic.in/divisions/ic/wssd/doc3/chapter13/css/Chapter13.htm>

*Showcases the Slum Networking Project, Indore jointly undertaken by the Indore Development Authority and DFID covering health care, infrastructure and community development*

### **Waste Water Recycling**

The Auroville, Pondicherry

[http://www.auroville.org/research/water\\_recycle.htm](http://www.auroville.org/research/water_recycle.htm)

*Provides details on the adoption of root zone treatment system for the recycling of waste water under the Decentralised Wastewater Systems*

### **Root Zone Treatment System**

Central Pollution Control Board, New Delhi

<http://www.cpcb.nic.in/pciiahandbook.htm>

*The Central Pollution Control Board provides a handbook on the application and assessment of Root Zone Treatment System*

### **Duckweed Based Wastewater Treatment System**

<http://www.cpcb.nic.in/r&d-cpcb/ch7-20603.htm>

*The Central Pollution Control Board provides information on the application and assessment of Duckweed Based Waste Water Treatment System*

### **Ecological Sanitation**

Anton Earle, October 2001

[http://www.thewaterpage.com/ecosan\\_main.htm](http://www.thewaterpage.com/ecosan_main.htm)

*This document of The Water Page, an independent initiative with emphasis on Africa and other developing regions, provides a detailed evaluation of ecological sanitation technologies.*

### **Ecological Sanitation and Reuse of Water-ecosan-A Think piece on Ecological Sanitation**

Jensenn, P.D. et al (2004), The Agricultural University of Norway

[http://www.dep.no/filarkiv/204575/ecosan\\_thinkpiece\\_final3.pdf](http://www.dep.no/filarkiv/204575/ecosan_thinkpiece_final3.pdf) (size: 871 KB)

*This paper is a "think piece" showing that there are comprehensive experiences and technologies that meet new and sustainable sanitation requirements in developing countries*

### **Ecological Sanitation - Revised and Enlarged Edition**

Winblad U & Simpson-Hébert M (editors) (2004), Stockholm Environment Institute, Stockholm, Sweden

<http://64.233.161.104/search?q=cache:hZkDvH6gyMJ:www.ecosanres.org/PDF%2520files/Ecological%2520Sanitation%25202004.pdf+low+cost+and+ecologically+sound+sanitation+practices+&hl=en>

<http://www.ecosanres.org/PDF%20files/Ecological%20Sanitation%202004.pdf> (size: 1.24 MB) Pdf format

*This book discusses sanitation for the future, describing available technologies and experiences across the world and further highlighting the challenges faced and benefits perceived*

### **Low-Cost Urban Sanitation**

Mara, D (1996), John Wiley and Sons, West Sussex, UK

*This book covers the public health, technical, socio- economic, socio-cultural and institutional aspects of sanitation in towns in developing countries.*

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

### **Consolidated Reply: Cost-effective & financially sustainable urban water supply & sanitation services/from IWMI, Gujarat/Comparative Experiences**

<http://www.solutionexchange-un.net.in/environment/cr-public/cr-se-wes-16060501-public.doc>

*It provides examples, experiences and additional readings in the context of cost-effective and financially sustainable approaches for provision of urban water supply and sanitation services*

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## Responses in Full

### **D Chandrasekharam, Indian Institute of Technology (IIT), Mumbai**

Perhaps the best way is to adopt Sulabh Sanitation (Sulabh Shauchalaya) method initiated by Dr Bindeshwas Pathak.

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### **Sara Ahmed, Indian Institute of Management (IIM), Ahmedabad**

Sorry, I should have got back to you after the NGI seminar with this information but anyway it's good to see you using SE-WES! As far as rural Gujarat goes, then Shri Ishwarbhai Patel at Safai Vidyalaya is the best to contact: safai@icenet.net Tel. 27557702, 27556247 (The Environmental Sanitation Institute, Gandhi Ashram, Ahmedabad 380 027). They have several examples of eco-sanitation, but I don't think have worked in North Gujarat.

WASMO, as the main facilitating organisation for the Swajaldhara program, is also responsible for fund disbursement under the Total Sanitation Campaign if I am not mistaken - there should be a district level office for Patan which you could contact.

Some NGOs, e.g. Utthan, are also promoting loans for sanitation through women's SHGs (San-Banks) but its too early to say how repayment is proceeding (utthan@icenet.net). Pravah is working on sanitation in urban slums of Ahmedabad with partner NGOs so you may want to look at the options they are promoting. There's also a report Pravah has done on urban community sanitation alternatives - a rapid assessment of slums in Ahmedabad looking at pay-and-use toilets, the Slum Networking project, etc. (pravah@rediffmail.com, pravah@icenet.net).

Of course one of the best NGO initiatives in promoting rural sanitation and environmental health is Gram Vikas, Orissa - they've really been able to cover complete villages in predominantly poor, adivasi areas and got users to contribute to partial costs (the rest is subsidy and loans). You can get in touch with Joe Mediath at: info@gramvikas.org and see if they have literature they can send you. There's also the Rama Krishna Mission's work at Midnapore, W Bengal which I am sure you can access - maybe through UNICEF?

Finally, the Water Supply and Sanitation Collaborative Council (WSSCC, Geneva) through its WASH Campaign (Water, Sanitation and Hygiene) will be launching the global 15/15 Campaign to enable 15 million people to reach basic sanitation by 2015 as part of the MDGs. I know that India will be a key partner in this campaign (funds are yet to be sanctioned) and the WSSCC will be looking for organisations that can 'deliver', i.e. meet 'hard' sanitation targets supported of course by the software of capacity building, hygiene education, etc. Nafisa Barot, South Asia Regional Representative for the WSSCC is the best person to get in touch for more information on this initiative (nafisa@icenet.net).

I hope that this is useful and you can follow up with the organisations listed.

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### **A K Sengupta, WHO, New Delhi**

Since you are in Gujarat please get in touch with Mr. Ishwar Bhai Patel of Environmental Sanitation Institute at Ahmedabad. They are working in this field for last 40 years or so. They have got a "Sanitation Park" to show different low cost technologies.

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**Nafisa Barot, Utthan, Ahmedabad**

We have been working on sanitation issues in the rural areas as well as have some experience in collective irrigation managed by a group of very poor women in Dahod area.

For the query of Dinesh kumar, I would suggest you could look at eco sanitation, where in use of water is very less and the solid matter used as fertiliser. Sandeep from Hunnar Shala in Kutchch could provide you with more information.

Our women in Bhavanagar and Rajula are accessing low interest loans for sanitation from Friends of Women's World Banking.

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**AJ James, Pragmatix India, Gurgaon**

In response to your query, I would like to mention the work of an NGO in the Netherlands called WASTE ([www.waste.nl](http://www.waste.nl)), which has been doing precisely this kind of documentation of ecosan practices in different parts of the world. They have been working on eco-san projects in different parts of India (I know about Bangalore and Delhi). In Delhi, they work with Madhab Nayak of FODRA in the trans-Yamuna region ([madhab.nayak@fodra.org](mailto:madhab.nayak@fodra.org)).

The WES section of UNICEF India has also been promoting eco-san toilets (e.g., in Alwar, Rajasthan), and perhaps Paul Deverill ([pdeverill@unicef.org](mailto:pdeverill@unicef.org)) may be able to point you in the right direction as far as documentation is concerned.

There are also several interesting indigenous techniques being applied in rural Maharashtra, recently documented by the Water and Sanitation Program – South Asia), about which Mark Ellery ([mellery@worldbank.org](mailto:mellery@worldbank.org)) or C. Ajith Kumar ([ckumar1@worldbank.org](mailto:ckumar1@worldbank.org)) may be able to give you more information.

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**Sudarshan Iyengar, Centre for Social Studies, Surat**

I am hope you are addressing this to a larger audience. Bangladesh has done well and I hope they will respond. Have you visited Sughad campus of Environmental Sanitation Institute of Ishwarbhai Patel. He has built well.

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**[Avani Mohan Singh](#), Haritika, Sangli**

We were working with UP.Rural water supply and environmental sanitation project (Swajal) project in Jhansi and Lalitpur districts of Uttar Pradesh. Open defecation is really a common problem in most part of our country. We have developed few model villages in Jhansi/Lalitpur and Chhatarpur in sanitation and drinking water point of view.

Here in Bundelkhand region of UP and MP the soil strata is rocky. That is why we have promoted low cost twin pit pour flush model of latrines cost around Rs.3000 of latrine. Also providing soak pit, compost pit and CC road with drain for safe disposal used water.

Our one of the village have 100 sanitation cover having free from open defecation.

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### **Ruchita Khurana, ToxicsLink, New Delhi**

I have come across a recent report by The water and Sanitation Program titled "Scaling up Rural sanitation in South Asia". The publication cites some good case studies from developing countries on sanitation programmes. The report is attached for your reference (<http://www.solutionexchange-un.net.in/environment/cr/res19090501.pdf>)

Also I would suggest you to contact Dr. Kamala Choudhry from Vikaram Sarabhai Foundation. Dr. Choudhry is extremely knowledgeable on the subject of rural sanitation issues.

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### **Ashok Paikaray, Mahavir Yubak Sangh, Bhubaneswar**

We have a success story on TOTAL SANITATION CAMPAIGN in Begunia, a block in Khurda district in Orissa. People of this block are used to relieving themselves in the open. They go to fields, meadows, the sides of roads to answer the call of nature. In the process they pollute the air and defile the water of the pond as they consider so sacred. No wonder, they suffer.

Children emulate the elders. The students of the local schools go to the fields to relieve themselves. All their knowledge about health and hygienic remains confined to books. Of course, they know they should change their habits. But in practice they do nothing of the sort. No facilities were available. But what was worse was the lack of will to change things. It is no easy tasking to changes the attitude of people, attitude formed over generations. These were also being reinforced in the school.

Not that every family in the village is poor and lacks in the means to construct a house hold latrine. The fact is for villages are not a priority. It does not occur to them that by defecating in the open, they are actually inviting serious health hazards. However a change took place. The district water and sanitation mission headed by zilla parishad president Sri Prasanta Kumar Jagdev the mission selected all the schools in Khurda district for covering under total sanitation campaign. A toilet unit consisting of two urinals, one for boys and the other for girls, and a latrine was constructed at a cost of twenty thousand rupees. It was not difficult on the part of the school to contribute 10% of the total cost amounting to two thousand rupees. The construction of a toilet complex became a reality. Mahavir Yubak Sangh (MYS) a NGO in Orissa come forward to support this campaign. Till date we have completed 21 school toilet complexes in Begunia Block in five gramapanchyats. For the students of the school things have now changed to attend the call of nature. This has given a sense of dignity to them.

Promotion of individual household latrines is the primary focus of the project and this will be done through a demand driven approach.

Another achievement by the NGO was that till date we have constructed about 1148 individual household latrines for the BPL famines in those panchyats namely Sarua, Baghamari, Begunia, Radhakantapur and Govindapur of Begunia block in Khurda distict. The massive campaign is possible only because of the involvement of president zilla parishad SJ. Jagdev and the PRI members in the block.

There are several hindrances to move this total sanitation campaign as there is acute water problem during summer. In each flush one member has to use two bucket of water. So sanitation is incomplete without water.

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**Suvojit Chattopadhyay, Gram Vikas, Berhampur, Orissa**

Gram Vikas has been working on water and sanitation for over a decade now, among the poorest rural communities in Orissa. We have found that even among the poorest of communities, it is not low-cost that matters; it is more an issue of cost-effectiveness. This implies a premium on quality, being absolutely uncompromising on standards of construction and institutional mechanisms that need to be put in place. I am attaching a short concept note on our approach to water and sanitation - and how, in a state as poor as Orissa, this model has successfully proven itself over and over again, in fact, 211 times  
<http://www.solutionexchange-un.net.in/environment/cr/res27090501.doc>

Hope you find it interesting. Do get back to us with your comments and suggestions. We would be happy to share with you further details regarding our programme if you wish.

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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 Solution Exchange for WES-Net at [se-wes@solutionexchange-un.net.in](mailto:se-wes@solutionexchange-un.net.in) with the subject heading "Re: [se-wes] Query: Low cost and ecologically sound sanitation practices, from IWMI Anand / Comparative experiences".*

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