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### Sanitation Issues of India

- Health and Dignity
- Sanitation to 610 million people
- Rapid urbanization- increased generation of waste water → 
- Increased gap between generation and treatment of waste water
- Decrease in fresh water availability per capita
- Need of huge funding US\$15BN for CST → 

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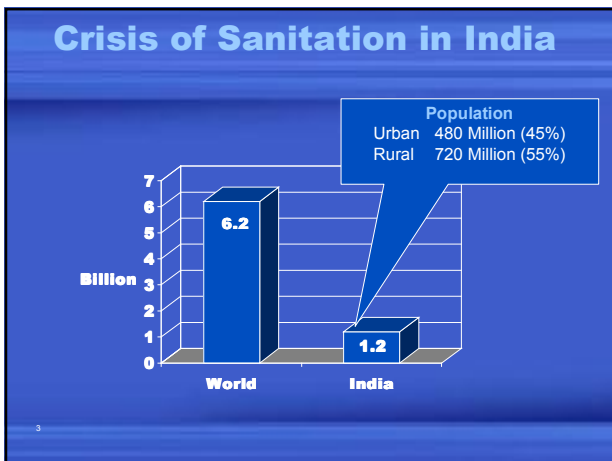
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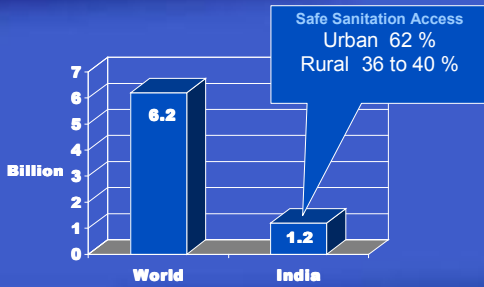
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## Crisis of Sanitation in India



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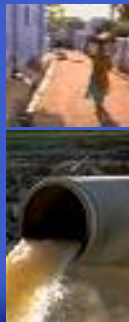
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## Need of an Hour

- Safe sanitation access to all
- Solution to provide safe sanitation
- Suitable technology to reduce excess use of water
- Minimize environmental degradation



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## Applications And Progress Of Ecosan In India

- Major ecosan founder organisations focussing on India since last 4-6 years.
- Ecosolutions-In southern part of India.
- GTZ-Promotion and Pilot projects.
- Seecon-Pilot projects, Workshops, e-learning courses, capacity building.
- IWWA-Awareness creation, promotion, workshops, training courses.
- Ecosanres-Along with Unicef-promotion, ecosan material, workshops.
- BORDA-small projects, workshops, training of man-power for construction.
- Sulabh International-R&D for urine use, chain of public toilets with reuse principle by incorporating biogas systems.
- Local NGO;s

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## Workshops and Conferences



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## Ecological Solutions



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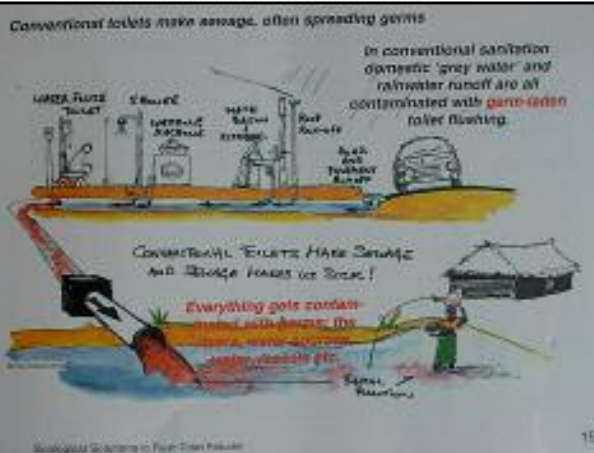
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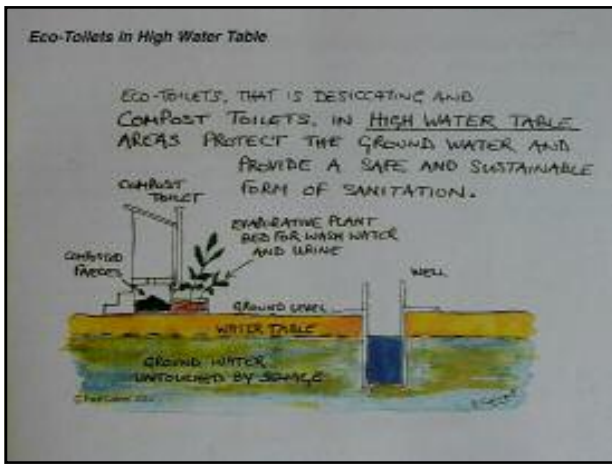
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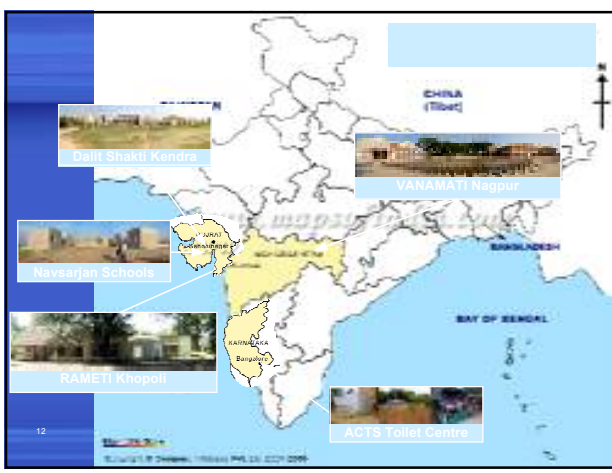
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## INDIAN WATER WORKS ASSOCIATION-IWWA

- Foremost NGO of water and sanitation Engineers and Professionals in India
- Working through 27 centers spread over India
- Have separate ecosan cell
- Awareness creation through workshops, conference, training courses
- Promotion of ecosan by implementing pilot projects
- Till today organized 5 workshops with help of GTZ and Seecon spreading over India
- Successful organization of International Conference in 2005

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## About Indian Water Works Association

- IWWA is a galaxy of Engineers and scientists working in the field of water and sanitation.
- IWWA is a non-Government organization launched in the year 1968.
- Now IWWA has 26 centers in almost every state of the country.



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## IWWA's National and International activities

- Information exchange platform
- New Technologies,
  - Management methodologies,



The activities to cite a few include:

- National Annual Convention.
- International & National Seminars, workshops and conferences.
- Monthly lecture sessions.
- Technical visits
- People's awareness programs.



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## VIRAR SCIENCE GARDEN



- Project name- ecofriendly public toilet center at Virar science garden
- Type of project- Public toilet center
- Implementing organisation-Virar Municipal Council
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**Design assumptions and design parameters for Virar Project**

**Blackwater production:**

Calculation of daily blackwater production is based upon the following assumptions:  
people contr. to blackwater prod.: ca. 200 to 400 per persons per day  
specific blackwater production: ca. 3,5 to 4,0 litres per person per day  
For calculating the appropriate size of the digester, 3,5 to 4,0 litres of wastewater per user per day is considered. Based upon these assumptions daily blackwater production will be ca. 0,8 to 1,5 m<sup>3</sup>. If no further biowaste (e.g. wet organics from the nearby vegetable market, ...) or manure is codigested along with the blackwater, the required reactor capacity (hydraulic volume of the biogas plant) has to be ca. 45 m<sup>3</sup> (considering a hydraulic retention time of 30 days).

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**Biogas production:**

Calculation of daily biogas production is based upon the following assumptions:  
people contr. faecal matter: ca. 200 to 400 persons per day  
specific biogas production: ca. 0,025 to 0,030 m<sup>3</sup> per person per day  
If no further biowaste (e.g. wet organics from the nearby vegetable market, ...) or manure is codigested along with the blackwater, daily biogas production is estimated to be 6 to 10 m<sup>3</sup>. Weekly biogas production (about 40 to 70 m<sup>3</sup>) equals ca. 1 to 2 cylinders of LPG (@ 14,2 kg each). Annual biogas production of ca. 2,200 m<sup>3</sup> to 3,600 m<sup>3</sup> (equals 50 to 100 cylinders of LPG) is worth Rs. 22,000 to Rs. 44,000 (@ present costs of about Rs. 425 per cylinder).

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**Pandharpur- The Pilgrimage Town**



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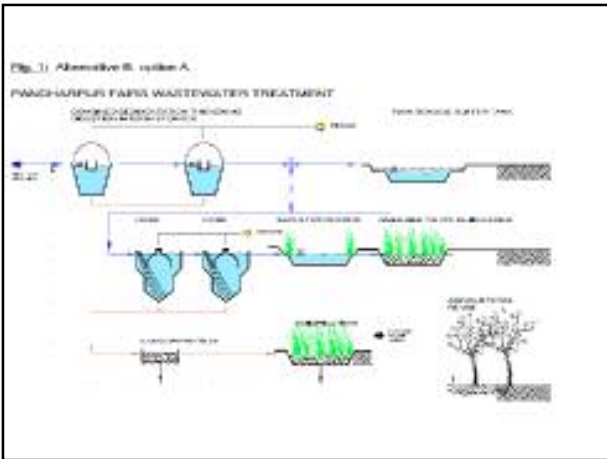
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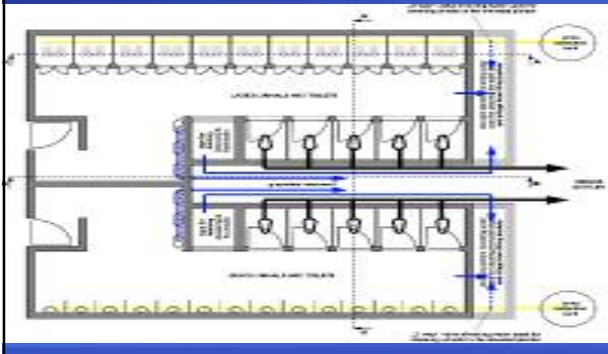
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### Design of the new sanitation centre- Badalapur School Project.



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### Badalapur-Project



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### New common sanitation complex at DSK (under construction)



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**Rear view (right) of toilet block at Navsarjan Primary School in Dhandhuka**



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**ACTS ecosan Pilot Project - Public Toilet Centre, Bangalore  
Reuse of urine as liquid fertilizer in banana production**



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## Challenges For Ecosan Promotion In India

- Geographical Diversity
- Social And Cultural Issues
- Anti-scavenging Laws
- Inadequate Funds For Innovation And Alternative Solutions
- Large population with moderate literacy
- Requirement of continuous IEC campaign

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Daily increase in population to be served to meet the MDG target on water supply and sanitation in 2015

Country	Projected Population (10 <sup>3</sup> )	MDG Attained Coverage (%)		Daily Increase Needed In People To Meet The MDG Targets	
		Water Supply	Sanitation	Water Supply	Sanitation
Afghanistan	41,401	no data	no data	-	-
Bangladesh	168,158	86	62	8,000	7,000
Bhutan	2,684	no data	no data	-	-
India	1,260,366	84	56	33,000	82,000
Iran	79,917	96	92	3,000	3,000
Maldives	416	100	no data	> 50	-
Nepal	32,747	85	56	2,000	2,000
Pakistan	193,419	92	69	9,000	11,000
Sri Lanka	22,293	86	60	1,000	1,000
South Asia	1,801,401	86	60	64,000	115,000

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## India




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## Ecosan IEC campaign

- Short courses(IWWA,SEECON,GTZ)
- Showcasing permanent models
- Project consultancy
- R&D
- News letter
- Translation of ecosan material in local languages

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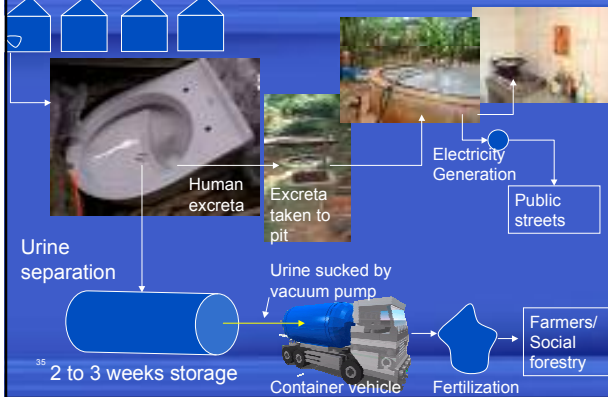


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## Eco Public Toilets Scheme 1




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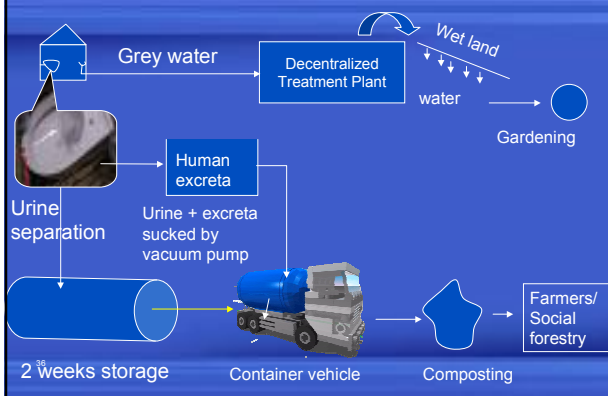


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## Eco Individual Toilets Scheme 2




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## Achievements

- Effective network in place
- Awareness generation programme continued
- Workshops and Conferences to reach masses
- Training courses to begin for ecosan professionals
- Pilot cum R&D projects on the rise
- Ecosan material in local languages

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## Observations and Suggestions

- More ecosan experts are needed
- Sustainable campaign to highlight ecosan concept
- New townships being developed where no CST ecosan can provide viable alternative
- Peri Urban areas not connected to CST should be regarded as potential ecosan sites on informed choice basis
- Ecosan service provider to be developed
- More pilot cum R&D projects needed, particularly for reuse of urine
- Funds for IEC to be increased considering size of the country

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## Thanks

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