

Sanitizing India through Technology

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Technology Adoption In Sanitation

- Eliminate the perceived electronic phobia among the common man as it was with ATMs and Mobile Phones.
- Ensure that there is no excess use of power and water and identify means to reduce the use of these valuable resources.
- Ensure that technology does not compromise on the compactness and sleekness much wanted of a public toilet.
- Cost is another determining factor
- Service levels and frequencies of break down should be kept to the minimum thereby reducing the operational and maintenance costs.



PARAMETERS

- Cleanliness & Hygiene
- Maintenance & Upkeep
- Sturdy Enclosure
- Cost Factor

- User Experience & Interfaces
- Accountability & Ownership
- Waste Treatment
- Return on Investment
- Sustainability in the long run



CURRENT SCENARIO: TOILETS ..TOILETS.. EVERYWHERE ?



INEVITABLE QUESTIONS

- Sambalpur District from Odisha says:

Of the total 1492 school - both primary and upper primary - girls' toilets need to be built in 192 schools. But **in 272 schools, though toilets for girls exist, they are not fit to use.**

- How much **money** the Govt. is pumping for sanitation in schools?
- And, why is it still **not successful**?
- How do we ensure **quality and retention**?



INFRASTRUCTURE GAPS

Nearly 76% of India's schools are operated by the government, but nearly half these schools don't have usable toilet facilities for girl students.

State of toilet in schools

(in %)

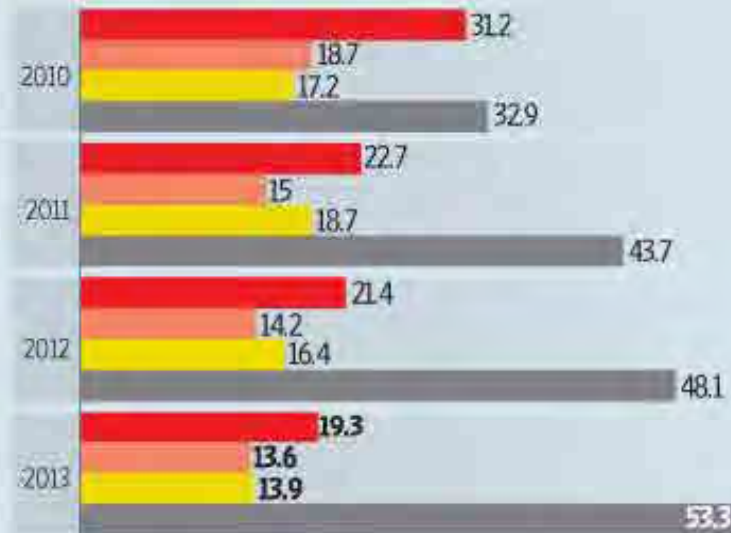
- No toilet facility
- Facility but not usable
- Usable toilet



Girls toilet

(in %)

- No separate provision for girls toilet
- Separate provision but locked
- Separate provision, unlocked, but not usable
- Usable girls toilet



Source: Annual status of education report 2013

YET ANOTHER FAILED ATTEMPT

- MP-MLA Local Area Development Funds
- Toilets are sponsored by the MP/MLA with much hype and attention
- Toilets become unusable in a short span of time since there is no one to take care of the recurring charges
- End Result: The MPs/MLAs name gets tarnished and the toilet structure remains testimony to that.
- Question: Who will take care of the **maintenance**?
 Who will bear the **ownership**?



*Ninety three of these Nirmala
toilets have been funded by the
Infosys Foundation*

SARVA SIKSHA ABHIYAN: THE REAL STORY

THE HINDU

Cities » [Bangalore](#)

Published: February 12, 2013 08:26 IST | Updated: February 12, 2013 08:37 IST

Schools have toilets, but children can't use them

Bageshree S.

Nisha (10) avoids going to the toilet during her school hours to the extent that she can help it because “and she “cannot bear the smell”. The toilets are too few in her school that has over 500 children and it is Nisha goes to a private school where most children are from middle-class families that “education”. But a basic facility like a toilet that children can actually use

In terms of numbers, even government schools

Analytical Report published by the

have toilets for boys

Cumulative Progress under SSA up to 2011-12		
Sl. No.	Item	Sanctions
1.	Opening of New Schools	2,09,914
2.	Opening of New Upper Primary Schools	1,73,969
3.	Construction of Primary Schools	1,92,392
4.	Construction of Upper Primary Schools	1,05,562
5.	Construction of Additional Classrooms	16,03,789
6.	Toilets	5,83,529
7.	Drinking Water facilities	2,23,086
8.	Teachers	19,65,207

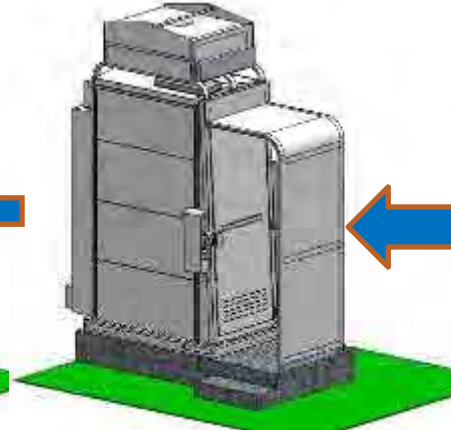
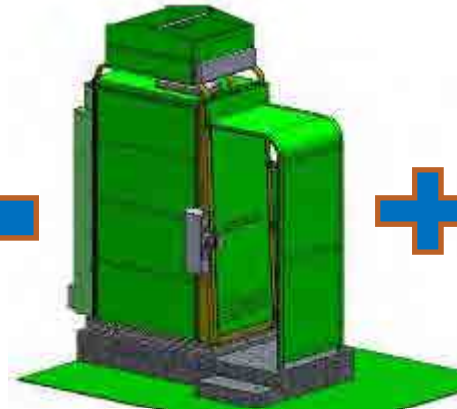
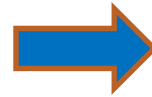
Source: Ministry of Human Resource Development, Annual Report, 2011-12



A locked toilet at Government Middle School, Thakrakot in Reasi.

“Our school has got just one toilet but it remains locked for students. It is opened only when some government officials come for inspection,” alleged a Class VIII student of the school. “

EVOLUTION OF ELECTRONIC PUBLIC TOILET



TRIALS WITH DIFFERENT MATERIALS



Plastic Model

Ferro Cement Model



Vasper Model –Honey Comb

e-toilets stand up to cyclone fury

Pashmina Waterfront BLR - 16 Acre Residential Paradise Abutting 12 Acre Serene Lake.

pashminadevelopers.com

Site by Google

G.V. PRASADA SARMA

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One of the e-toilets that withstood the severe gales at Diamond Park in Visakhapatnam.— photo: C.V. SUBRAHMANYAM

Hudhud has blown away hoardings, panels, sheets and makeshift tents and wrought havoc. But four e-toilets that have been set up as public convenience by GVMC have withstood the gale.

Four e-toilets have been set up at Diamond Park, Jagadamba Junction and on the Beach Road.

The e-toilets have been designed to withstand extreme weather conditions and gales.

They are made of steel and are set up by Kerala-based Eram Scientific Solutions (ESS). They have pre-flushing before entry, automatic flushing and sensors for water, according to the manufacturer.

The e-toilets have two components: electronic and mechanical. The electronic component is custom-made to suit extremities of weather and have worked at -50 degrees at Gulmarg in early 2013, ESS CEO Anvar Sadath told *The Hindu* over phone on Saturday.

Similarly, their sturdiness passed another test when it withstood storm again in June last at

New Delhi, he recalled.

The e-toilets designed can withstand wind speed of 39m/s at Thiruvananthapuram but not higher speeds.



eToilet

India's first Electronic Public Toilet developed by Eram Scientific

- The eToilet is a modular, pre-fabricated public toilet made of steel and is integrated with user-friendly electronic interfaces, to ensure cleanliness and hygiene to every user.
- Unmanned and automated, eToilets have remote monitoring capabilities and its health status can be tracked over web.
- eToilets feature automatic cleaning process through Pre-flush, After-flush and automatic platform cleaning.



eToilet VARIANTS



Public Model in Stainless Steel

Public Model in Mild Steel



She Toilet



School/
Civic Model



CURRENT SCHOOL MODEL



THE HINDU YOUNG WORLD FRIDAY, AUGUST 8, 2014 THE COMPLETE NEWSPAPER FOR CHILDREN

Green army all set for action!

Nature's soldiers will now show you the way to a cleaner and greener environment.



PHOTOGRAPH BY: [Name] / [Location]

By [Name]

Learn to learn
[Text about the importance of learning and the role of the Green Army in promoting environmental awareness.]

Learn to learn
[Text about the importance of learning and the role of the Green Army in promoting environmental awareness.]

Learn to learn
[Text about the importance of learning and the role of the Green Army in promoting environmental awareness.]

Promoting healthy sanitary habits among children

e-toilets at Karuvarakundu government school

Staff Reporter

MALAPPURAM: Government Higher Secondary School at Karuvarakundu in the district has got three modern electronic toilets (e-toilets) from Oil and Natural Gas Corporation Ltd. (ONGC).

The school became the first in the State to get e-toilets, under ONGC's corporate social responsibility scheme.

ONGC chose the Karuvarakundu school considering its recognition by the Ministry of Human Resource Development as one of the five smart schools in the country.

The 4,096 students and 110 staff of the school could use the toilets and it would go a long way in improving sanitation on the campus, K. Anwar Sadath, chief executive officer of Eram Scientific Solutions, which developed the e-toilets, said.

"Our school model e-toilet is exclusively designed to meet the specific sanitary needs of students," he said. Mr. Sadath will open the facility on Thursday.

The e-toilets being set up at Karuvarakundu have ergonomic enclosure, better access, student-specific instruction boards, and car-



GREAT LEAP: Students of Government Higher Secondary School at Karuvarakundu in Malappuram district in front of the e-toilets set up by Oil and Natural Gas Corporation Ltd.

toons promoting hygiene and sanitation.

They have a pre-flush system, after-use auto flush and manual flush, automatic floor wash system, sensor-enabled user detection system, health faucet, overhead water tank, stainless steel wash-down squatting pan, overhead display for indicating machine status, sanitary napkin vending machine, and napkin incinerator. The e-toilets designed with Green Army caricatures would promote good hygiene habits among

children, sources said.

ONGC had implemented the scheme through Kerala State Electronics Development Corporation Ltd. (KSEDC). Mr. Sadath said Eram Scientific Solutions had set up more than 500 e-toilets across the country.

The largest single deployment of e-toilets in schools in the country was in Kochi, where 35 schools got 105 units under the Chief Minister's award-winning programme called Suchi@School conceived by P. Rajeev, MP.



eLITE

**WORLD'S
MOST
ECONOMICAL
LY PRICED
SOLAR
POWERED
ETOILET FOR
SCHOOLS**



FEATURES & SPECIFICATIONS OF THE PROPOSED MODEL

- ✓ Portable, Compact and User-friendly Design
- ✓ Durable Materials
- ✓ Less Maintenance
- ✓ Easy to Install and Service
- ✓ Status Indications
- ✓ Stainless Steel Closet with SS Floor
- ✓ Self-washing and Cleaning Mechanisms
- ✓ Automatic Ceiling light
- ✓ Solar Powered System (Optional)
- ✓ Manual Flushing System
- ✓ Sensor enabled Energy/Water saving Design
- ✓ Automatic Floor Cleaning Mechanism.
- ✓ Inbuilt water tank
- ✓ Can be connected to existing drainage or to STP
- ✓ Natural light provided

	DL9007 LC
Toilet Structure	50 x 30 x 2mm Thick MS Tube with Powder Coating
Panels	CRS with Powder Coating 1mm Thick
Overall Size (in Mille Metres)	1710L x 1000B x 2650H
Base (in Mille Metres)	1600L x 800B x 300H

MAJOR CONCERNS IN SANITATION AND HOW THEY ARE ADDRESSED

- Unavailability of Sewage facility
 - Multiple options for Sewage Disposal / Sewage Treatment Plants are available.
 - Sewage Treatment Plants include Anapackage based STP and DRDO Bio-digester.
 - Sewage Disposal options include construction of sewage pit.
- Lack of running water
 - Proposed unit has an inbuilt overhead water tank
 - Additional water tanks can be constructed at a extra cost
 - Bore well facility can also be opted.
- Lack of electricity
 - Solar panels has been integrated to the unit.



eToilet IMPERIAL MODEL



Coin/ Card Operated Entry
Disabled Friendly
Vacuum assisted power flushing
Sensor enabled water minimization

Air-conditioned Interiors
Toilet seat sterilization system
Touch free sensor switches
Recessed sanitary disposal

Monday, 15 September 2014

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ERAM TO COLLABORATE WITH IDEO FOR NEXT GENERATION E-TOILETS

Posted by: Kerala IT News | August 8, 2014 | in: IT & ITes

Trivandrum: USA based Ideo.org which is well known for human-centred design is collaborating with Technopark, Trivandrum based electronic Toilet Manufacturer, Eram Scientific Solutions for designing next generation e-Toilets. Ideo.org is part of well-known Ideo, the designer of Apple's first mouse, Microsoft's second mouse, Steelcase's Leap chair etc.

This collaboration for developing technology assisted affordable sanitation solution is supported by Bill & Melinda Gates Foundation (BMGF). The primary aim of this design engagement is to develop and enhance the pro- user interfaces, while optimizing space and ensuring cost affordability.



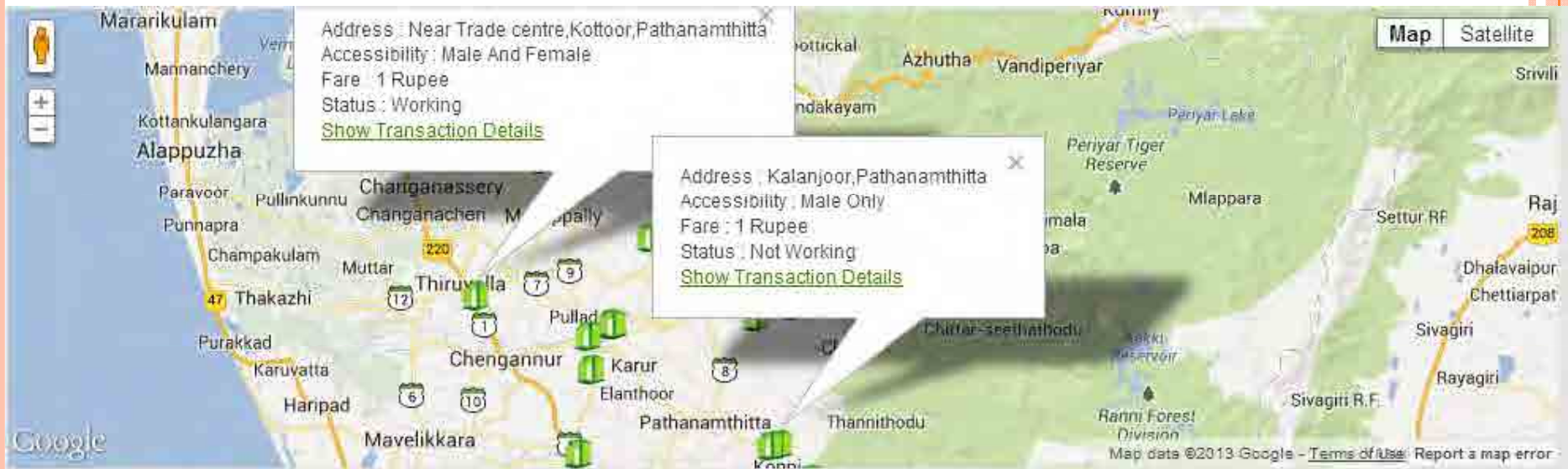
 Eram Scientific

Accountability through Online Monitoring Connected eToilet Infrastructure (CeTI)

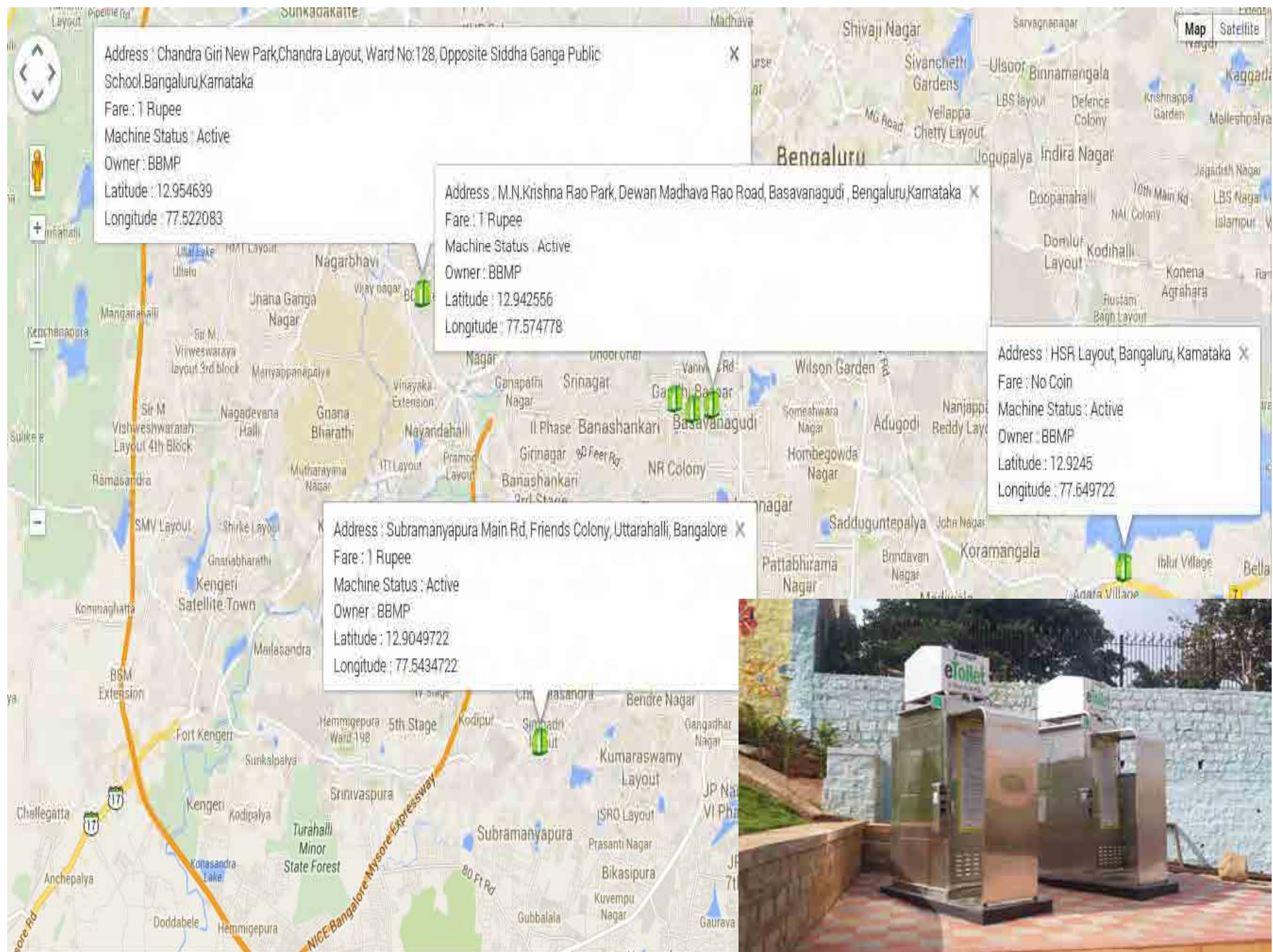
- GPRS connected futuristic toilet network for realtime tracking and updations
- Ensuring transparency and accountability of operations
- Mapping and connecting all the eToilet units via web and mobile
- Reports can be generated on footfalls, collections, water level, flush counts, etc.
- Travelers can identify and select the eToilet units according to their journey route.
- Green spaces with connected eToilets
- Toilet map to be made available on mobiles in the near future



Features



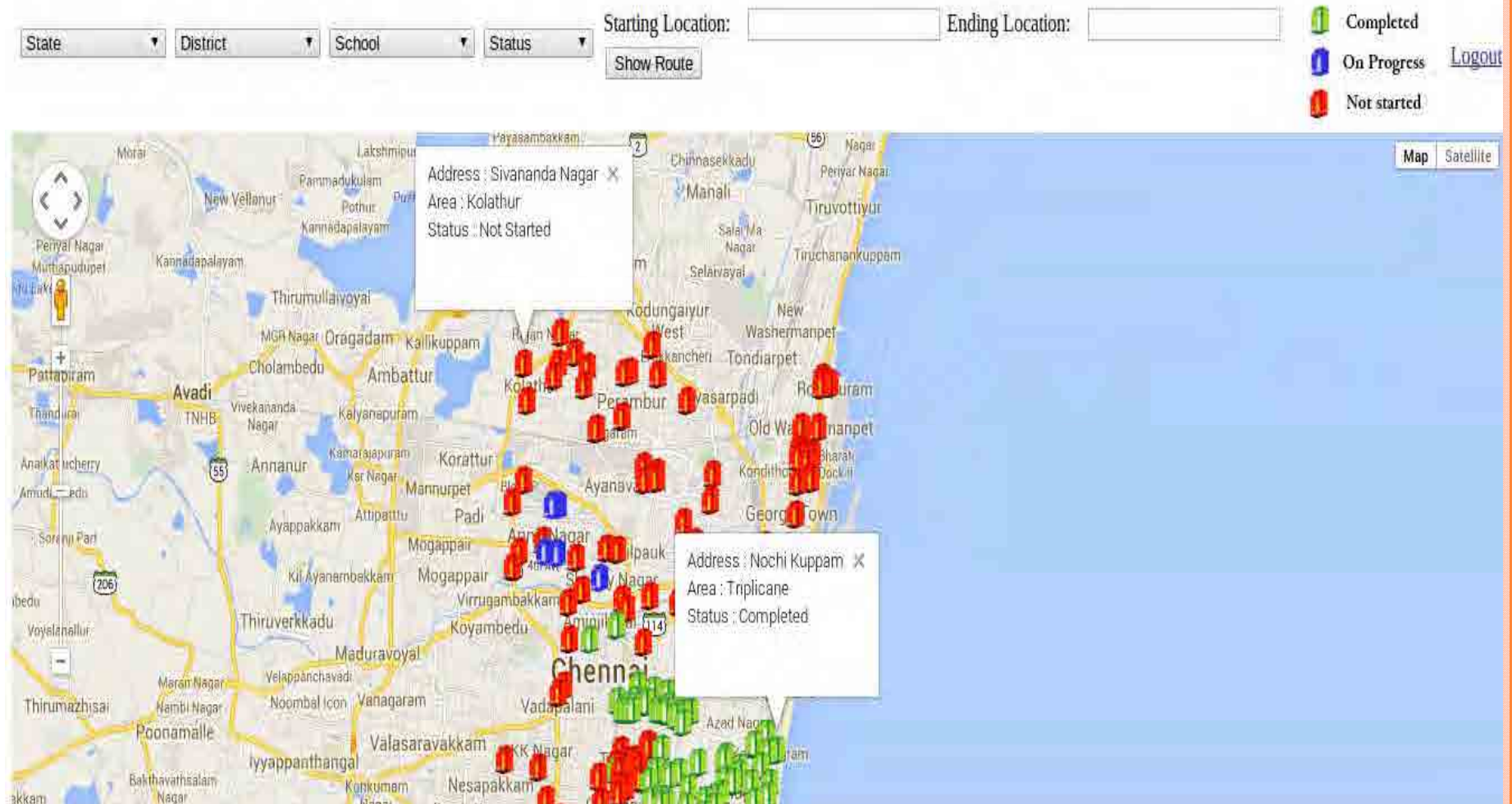
My Machines		Usage/Collections		Alerts		Reports
Total machines	27	Total Collections	7869	Intruder	558	Year wise Usage Report
Active	23	Todays Collection	17	Water Low	161	Year wise Collection Report
Not Working	4	Total Usage	4745	Complaints	2	
		Todays Usage	10			



CLUSTER-BASED APPROACH

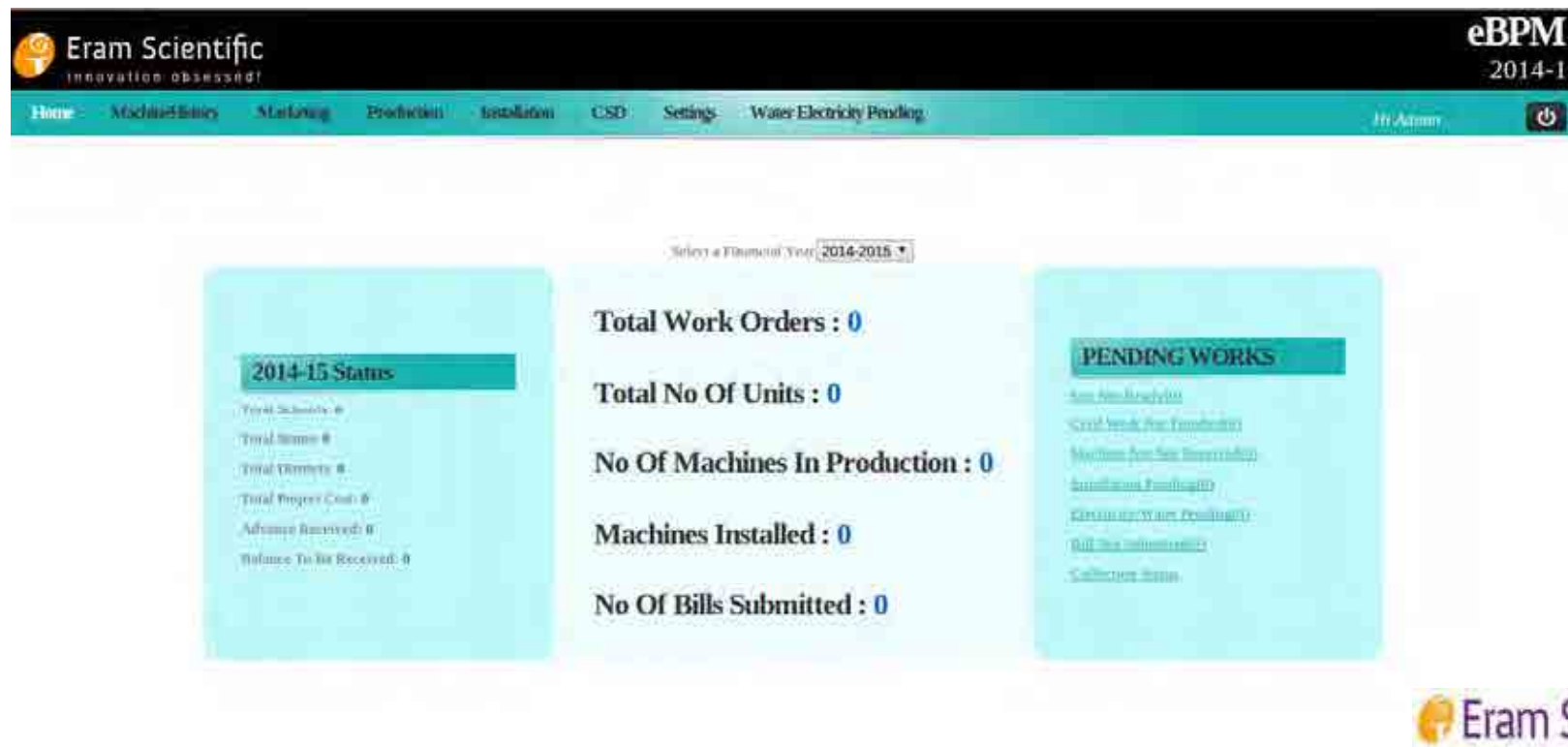
Chennai Toilet Map

[Work Status](#) [Route Map](#)





ONLINE ERP SYSTEM FOR PROJECT MONITORING

- A total ERP system for the entire project field implementation monitoring
- This would be similar to the Connected eToilet Infrastructure portal (<http://delightbharath.com/>)



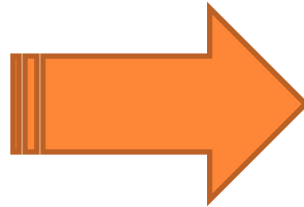
EASY ACCESS, TRANSPARENT OPERATIONS

<div>  Eram Scientific <small>Innovation obsessed!</small> </div> <div> eBPM 2014-15 </div>									
<div> Home MachineHistory Marketing Production Installation CSD Settings Water Electricity Pending </div> <div> Hi Admin  </div>									
WorkOrders									
Financial Year: All State: Select District: Select Schools: 									
SL No	CUSTOMER	LOCATION	UNIT	MARKETING	PRODUCTION	INSTALLATION	CSD	OVERALL STATUS	OPEN
1	VELINALLOOR GRAMAPANCHAYAT	VELINALLUR PANCHAYAT OFFICE PREMISES	Inside Panchayat Premises	WorkOrder : Received on 26-08-2014 Site : Ready Agreement : Not Received Customer Required Date : 0000-00-00	CivilMaterialStatus : Not Delivered STP status : Not Delivered Start Date of Unit Production : 00-00-0000 Expected Date of Completion : 00-00-0000	Platform : Not Done Installation : Not Planned Civil Finishing : Not Ready Water : Not Connected Electricity : Not Connected	Electronics : Not Done Sim : Not Released Firmware : Not Released CustomerAcceptance : Not Received DOI/Open to Public : Not Done	Marketing : Bill Not Submitted Production : Pending Installation : Pending Csd : Pending	VIEW
2	KURNOOL MUNICIPAL CORPORATION	KURNOOL MUNICIPAL CORPORATION OFFICE PREMISES	Kurnool Municipal Corporation Office Premises	WorkOrder : Received on 08-08-2014 Site : Ready Agreement : Not Received Customer Required Date : 2014-08-31	CivilMaterialStatus : Not Delivered STP status : Not Delivered Start Date of Unit Production : 00-00-0000 Expected Date of Completion : 00-00-0000	Platform : Not Done Installation : Not Planned Civil Finishing : Not Ready Water : Not Connected Electricity : Not Connected	Electronics : Not Done Sim : Not Released Firmware : Not Released CustomerAcceptance : Not Received DOI/Open to Public : Not Done	Marketing : Bill Submitted Production : Pending Installation : Pending Csd : Pending	VIEW
				WorkOrder : STP status : Not	CivilMaterialStatus : Not Delivered STP status : Not	Platform : Not Done	Electronics : Not Done		

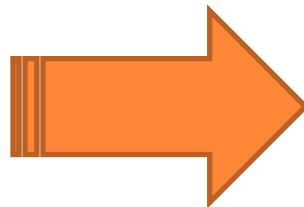
Return of Investment Assured

2 Types of Income Streams, unlike the Traditional Toilets

Income through
Advertisements



Income
through
coin collection



JOINT FIELD TRIALS FOR EFFECTIVE WASTE PROCESSING



CALTECH's
CLEW Waste
Treatment
System being
put aside the
eToilet at
Ahmedabad



ESS-DUKE UNIVERSITY JOINT FIELD TRIAL

Duke University's anaerobic
treatment system, 'Anaerobic
Digestion Pasteurization
Latrine' (ADPL) system
installed at IIT, Chennai
along with eToilet

Upcoming field trial with University of South Florida for developing
sanitation solution for slums, communities

SUSTAINABILITY IN THE LONG RUN

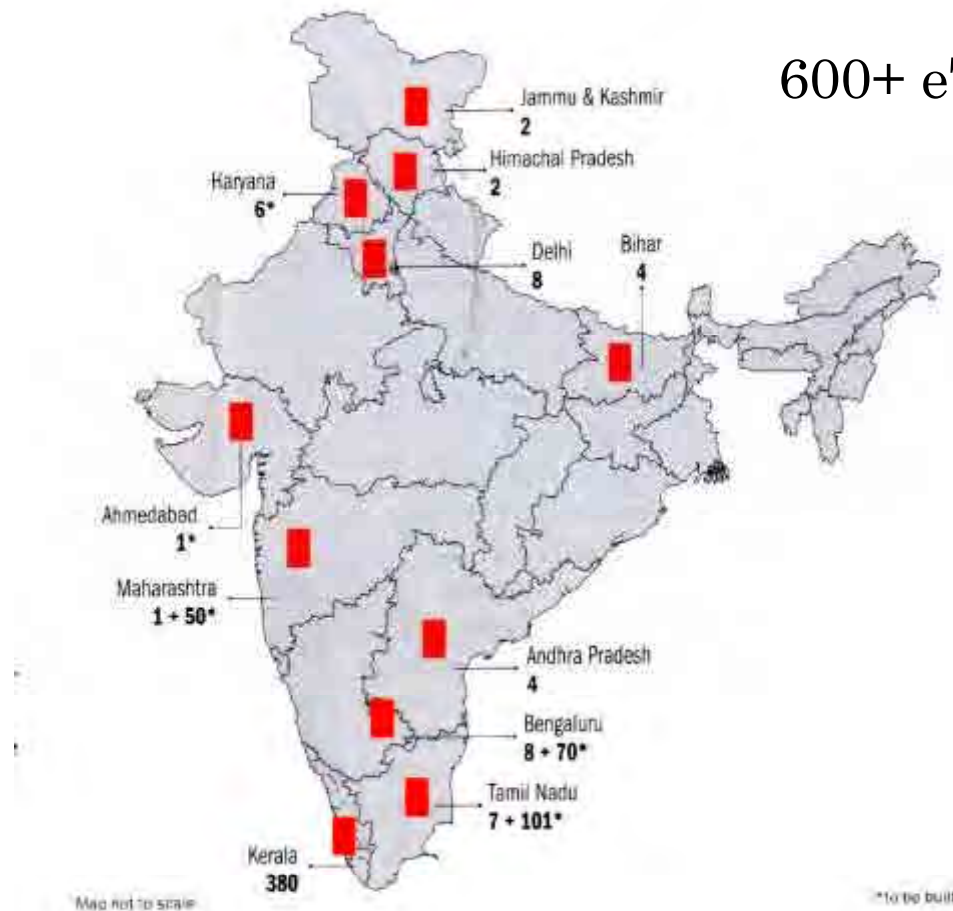


Reach

Source: Outlook BUSINESS / 5 September 2014

Looking beyond

Eram Scientific is now expanding outside its home state of Kerala



RECOGNITIONS FROM WORLD OVER


34+ Awards,
3 International
Grants
5 Research
Partners

600 **eToilet**
200+ STPs

*World's Most Innovative Company-India,
by FAST COMPANY*

एम ग्रुप
Eram Group



 Eram Scientific

MAJOR PROJECTS



RELATED KEYWORDS: She-Toilets | Chennai-Corporation

With She-Toilets, Chennai shows way in sanitation

Divya Chandrababu, TSN | Jan 26, 2014 | 9:53 AM IST

g+1 59

CHENNAI: The Chennai Corporation is aiming for a clean sweep to tackle problems of female hygiene and access to sanitation — special 'She Toilets' have been planned for women in 348 locations across the city and will be opened by the end of the year. They will also be the first e-toilets (electronic, fully automated toilets) in the city. The toilets will have sanitary napkin vending machines and incinerators.

"This is also the first time Chennai Corporation has done a detailed survey and mapping of where public toilets are required and where the public oppose it," said a senior corporation official. "Earlier the corporation would only ask the zonal engineer where to put up a toilet." These 348 locations include bus stands, markets and open spaces.



She toilets will come as a relief to women who work outdoors all day such as vendors, construction workers and police officers.



This eToilet Is Changing The Way Public Sanitation Works In India

Shravya Parikh | September 2, 2014 | Innovation, Sanitation, Technology



This is when the joined Eram Scientific Solutions Pvt. Ltd., the team that was coming up with innovative solutions to change the way public sanitation worked in the country.



Binty Baby, a civil engineer and a management graduate by profession, always wondered why something cannot be done about the poor condition of public sanitation system in the country. She was struck by the paradox that in a country like India with over 1.2 billion people, 55% of this population (nearly 600 million people) has no access to toilets. The situation is even more challenging for young school-going girls who are unable to get access to this basic necessity. Every month, girls between the ages of 12 and 18 are missing school for 5 days every month during their menstrual cycle because there are no decent toilet facilities in the school.

"And then I thought about the importance of IT in solving everyday issues. I believed that if technology is used in a smarter way, it could impact the lives of hundreds of people," Binty says.



VISION: eTOILET NEXTGEN

- Equip the sanitation landscape with CeTI by creating clusters and thereby developing the network of Connected eToilet Infrastructure.
- Ensure toilet provision is accessible and available to all
- Toilets which are self-sustainable, creating its own energy and water for its functioning and also powering the external environment.

THANK YOU!!!



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