



**CAN UNSKILLED MASONS BE CREATIVE?
LESSONS LEARNT FROM THE 'ECOSAN TOILET INNOVATION
CONTEST FOR MASONS' IN ACCHAKARAI, TAMIL NADU**

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Using the observations of

(in alphabetical order)

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SUMMARY

Between January 2006 and December 2008, 350 Ecosan toilets were built in Kameshwaram by about 25 masons from the adjacent village of Achakarai. Paradoxically, none of the masons had toilets in their own homes. Thus, Anbumani of the masons group approached FIN Trust via Mr. V. Ganapathy to demand help. In response, Shyama Ramani wrote out a project proposal for the construction of 20 ecosan toilets which was accepted for financing by the municipality of the city of Reims in France. However, instead of simply donating money for toilet construction, FIN decided to use it as an opportunity to foster creativity and innovation at the grass roots level. Therefore, an innovation for ecosan toilet contest was organized. The 25 masons were informed that they would receive financial help for the construction of ecosan toilets for their own homes and they were encouraged to think of 'improved' and 'new designs' for the same.

On July 17-18, 2009 a set of judges comprising architects, engineer and sanitation experts evaluated the toilets according to a number of criteria. Prizes were awarded to five masons. It was agreed that their efforts were laudable and a number of incremental innovations were identified as having been produced by the masons. These are presented in sections 4-5. However, it was revealed that many of the masons even after having participated in the construction of hundreds of ecosan toilets had made some basic mistakes and some of the technical innovations were not sound. Thus, the contest revealed that there is a need to create stronger 'local capabilities' in 'ecosan toilet construction' and put in place a system that permits the signaling of 'real and credible competence' in 'ecosan toilet construction' among masons.

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1. PRE-CONTEST ACTION



The funds were obtained from the city of Reims municipality in September 2008. But it was difficult to pass the message about the ‘reciprocity’ clause – that the masons would receive funds in the anticipation that they would invest efforts to build ecosans that marked a definite improvement or innovation over existing structures. So a first meeting was organized by Mr.Ganapathy and Mr.Paranjyothi in Nov 2008 to explain the concept of innovation.

Then a second workshop was organized with M.Subburaman of SCOPE and Mr.Chandranesan architect at SCOPE to give ideas on construction of ecosan to the masons in January 2009.



Finally, Gita Balakrishnan of Ethos arranged for us - a third workshop in April 2009 involving Felix Raj an architect from Chennai, who made a visit to give further ideas to the masons and motivate creativity.

Initially the idea had been to give money to each mason and let him buy his own supplies. But neither Mr.Paranjyothi nor the masons felt comfortable with this radical procedure and in the manner of most ‘conventional projects’ the basic materials were purchased for the entire group in March 2008. There was mutual agreement (even from the masons themselves) that if money was given freely, the masons would be tempted to spend money on other more pressing needs. Besides the building materials, a small amount of cash (Rs.1,500) for own creative spending on toilet. They were expected to contribute own labour – worth about 2,000 for this endeavour.

2. RESPONSES OF THE MASONS



- The masons were all master masons who had already built over 700 Ecosan toilets in Kameshwaram and elsewhere in India under the supervision and guidance and payroll of SCOPE – the leading NGO in the field.
- At first 25 masons expressed interest in building the ecosan toilets, but this group diminished to 20 and finally it was 18. Why? **The basic problem is that ‘ecosan’ as a technology faces ‘consumer resistance’ because there is a repugnance for the installation of human waste recycling toilet near a home.** Thus, seven masons backed out, even when they were being given supplies to build toilets free of cost.
- Thereafter at very regular intervals the masons were asked to give their innovative ideas in writing but they were reluctant to do so as it was a contest in which they could earn prize money and hence would not part with their new ideas.
- However in the end they found that ‘innovation creation’ required effort in terms of reflection and it was not evident to come up with new ideas.
- Though the materials were downloaded in their houses four months back, the pace of construction was slow. Despite the repeated requests of Mr.Paranjothi and four visits of mine to the village they took a lot of time to take up the work. Enquiries revealed that demand for masons was very great and they earned about Rs.300 or more per day if they went to work everyday. Naturally they were not prepared to forego this wage. The work on the substructure was over in 12 houses by June, but construction of superstructure was delayed. The masons took up the work of construction seriously only in the last five days. The womenfolk in their houses were going regularly for the NREGP work and this helped them earn about Rs.80 per day and could not help speed up the process.
- The superstructure work was then taken up seriously only four days prior to the date of completion and this naturally meant that was not much time for any specific creative innovation. In the last 24 hours however they made up for their earlier lethargic effort and finished the toilets in time. However the workmanship would have been better and certain minor mistakes they had made could have been easily avoided if they had been more systematic.

Table 1: Progress after giving of materials in March

Sl.No	NAME	Apr-29	May-21	Jun-27
1	ANBUMANI	basement finished	done till roof	finishing stage&door balance
2	ANBUSELVAN	basement finished	No progress	done till roof&finishing work progress
3	BASKARAN	basement finished	done till roof	finishing stage work progress

4	DEVADOSS	basement finished	done till roof	finishing
5	GNANASEKARAN	nothing	nothing	done till roof
6	IYYAPPAN	basement finished	No progress	finishing stagwork progress
7	KANNAN	basement finished	No progress	finishing stage work progress
8	LAKSHMANAN	Nothing	done till roof	finishing stage work progress
9	A.R.MAHENDRAN	basement finished	done till roof	finishig stage work progress
10	R.MAHENDRAN	Basement finished ?	Done till roof ?	DONE TILL ROOF WORK PROGRESS
11	MUNIYANDI	Nothing	done till roof	finishing stage work progress
12	NANDHAKUMAR	basement finished	done till roof	finishing stage work progress
13	POORNACHANDRAN	basement finished	No progress	done till roof.
14	RAJA	basement finished	No progress	done till roof
15	RAMAN	No progress	done till roof	done till roof work prores
16	RAVIKUMAR	basement finished	No progress	done till roof
17	SELLAIYAN	No progress	No progress	done till roof
18	THANDAYUTHABANI	basement finished	No progress	done till roof work progress

3. THE JUDGES AND CRITERIA USED FOR EVALUATION



We had a multidisciplinary team of four judges as shown on photo from left to right: engineer Chandraneshan (Chandranesan and associates), architect Felix Raj, architect Geeta Balakrishnan (Ethos) and sanitation expert, M. Subburaman (SCOPE). The criteria for judgment were formulated as follows by Gita Balakrishnan.

Nature of evaluation	Innovations in Planning: dimensions, sizes, light, ventilation etc.	Innovations in masonry: bonding, jalls, foundations, courses, lintels	Innovations in roofing techniques	Innovations in detailing – openings etc.	Ecosan features	Innovations in finishing .
Marks	20	20	20	20	20	20

4. GENERAL OBSERVATIONS ON THE TOILETS BUILT

It was revealed to us (we were not aware of it earlier) that the innovation contest was a real test for the masons themselves to know whether they could build solid ecosan toilets by themselves without the supervision of an engineer or architect. Though these masons had supposedly built over hundreds of ecosan toilets with SCOPE in different parts of the country and had even given training to other masons, so far they had always been supervised by an expert with a formal degree in architecture or engineering. They had simply obeyed instructions. Second, in most programmes they were required to build toilets in a record time of 4-5 days. Working feverishly to meet targets they never received feedback from other masons or toilet users.

Keeping the above in mind, all judges felt that the effort put in by the masons was most laudable. The quality of the Ecosan construction was much better than that of ecosan toilets made under the mass sanitation programmes in which they had participated! Furthermore, from the outside, most of the toilets were far more pleasing to the eye, more beautiful and more aesthetic than those made under mass sanitation programmes. It was clear that all the masons understood the basic principles underlying the construction of ecosan toilets.

The most striking ‘technical improvement’ was in terms of roofing. During construction of Ecosan Toilets in the past, the masons had found that it was very difficult to fix the joints of the roof slabs and often the sloping joints allowed the water to seep inside the toilet during the rains (as in the case in most toilets built by Gramalaya in Kameshwaram). Keeping this in mind, many masons had selected curved asbestos sheets as roof.

Other innovations were in terms of:

- ⇒ Roofing material – with use of different local materials.
- ⇒ Different materials for rafters to hold the roof in place.
- ⇒ Recycling of materials for new uses.
- ⇒ Arrangement of foot rests within the toilets. (e.g. horizontal arrangements of the toilet, provision of higher ground to act as foot rest throughout the length of the toilet etc.)
- ⇒ Use of tiles in different parts of the part.
- ⇒ Colour schemes and positioning of the ‘toilet slabs’ and foot rests within the toilet.

At the same time, many masons had made some very simple mistakes while constructing the toilets, revealing the real need to focus on better 'knowledge transfer' to unskilled masons so that they can build good quality ecosan toilets on their own without supervision from an engineer or architect. **It is quite revealing that after building hundreds of ecosan toilets they were not capable of building perfect toilets. This can surely be achieved easily if we can undertake a project to 'build skills in masons' rather than 'finish building toilets in record time'.**

The most common mistakes were as follows:

- The vent pipe cowl which was below the roof and not above. They simply left the same as it was since on 17th July they were unable to get a Proper T Joint to at least take the top portion of the cowl above the roof. The result was some masons decided to bend the pipe and this was technically not correct. Many had also not fixed cowl or a mosquito net atop the pipe.
- The footrest positioning was wrong in many houses.
- Not much thought had been given in selecting the site for the toilet. In most cases the toilet was at the furthest end of the compound and this prevented much scope for putting up a kitchen garden which has to be close to the urine pot and filter bed.
- The gardening was not done properly since they had finished construction only on the previous night.
- Not much attention was paid to provide special fittings inside the toilets.
- The steps were steep in many houses.
- Very few had provided lighting inside the toilet.
- In quite a few houses the terrain had a gentle slope from the house to the toilet, posing threat of water during rainy season to the compost chamber which was almost on the ground level. Masons like Mr.Devadas however had taken protective steps.
- One mason who built a water tank using the compost chamber wall as one of the walls of the water tank, abandoned the tank as the dampness in the water in the water tank would regard the dehydration of the compost in the chamber.

5. SPECIFIC DETAILS NOTED FOR EACH OF THE ECOSAN TOILETS BUILT BY THE 18 MASONS

1. Anbu Mani



+Good technical point	–Bad technical point	Aesthetic input
<p>+The vent pipe was taken to a height above the roof</p> <p>+ There was a provision for an attachment of an adjacent bath room in the future.</p> <p>+ Bamboo rafters for resting the roof.</p>	<p>–The vent pipe was taken to a height above the roof but the way the vent pipe was taken above the roof through a bend in the pipe. So – while the need to take it above the roof was understood, the bend in the pipe was not the best way to do so.</p>	<p>CDs on the façade</p>



2. Anbu Selvam

+Good technical point	-Bad technical point
<ul style="list-style-type: none"><li data-bbox="316 539 794 573">+ The vent pipe above or below roof?<li data-bbox="300 611 810 645">+ The roof had a parapet to hold it down.<li data-bbox="260 683 850 786">+ There is provision for a small area as one got down the steps to wash the feet with water draining off.	<p data-bbox="1007 539 1342 573">The toilet was incomplete.</p>

3. Bhaskaran



+Good technical point	-Bad technical point	Aesthetic input
+ Bamboo rafters for roof which had an overhang;	- Vent pipe was incorrect – at the window.	Old tiles on steps



4. Devadas - Special Mention Prize



+Good technical points

- + The outlet for urine and wash water is well-handled;
- + The bend is longer for easy-cleaning;
- + The garden is cordoned off.
- + There is protection for the plinth at the ground level – one of the few toilets to have this.
- +Nice latch for the door;
- +Spoon for putting the ash;
- + **Concrete filled into the bamboo to hold the bamboo and the roof down during heavy winds.**

5. Gnansekaran



+Good technical point	-Bad technical point	Aesthetic input
+Vent Pipe position correct	- Incomplete. - Roof just placed	



6. Iyappan - Second Prize winner



+Good technical point	-Bad technical point
<p>+ The only toilet where there is some experimentation with the planning.</p> <p>+Entrance from the side instead of the conventional front entrance;</p> <p>+PVC bend used for fluid outlets; This has also helped in solving the issue of the position of the vent pipe.</p> <p>+Larger vent pipe used wooden rafters; +Traps as filters for the fluid outlet; +Steel frame for door; +Shelf inside the toilet;</p> <p>+A platform provided for instead of the footrest – solves the problem of appropriate size of foot rest.</p>	<p>– vent finishing below the roof – needs to be corrected;</p>

7. Kannan



+Good technical point	-Bad technical point	Aesthetic input
+Bamboo rafters; +Filter for fluid outlets provided	- Vent ends below roof at window & needs correction.	

8. Lakshmanan



+Good technical point	–Bad technical point	Aesthetic input
<p>+ The only toilet to have handles for the chamber openings at the back which aids in opening.</p> <p>+Bamboo rafters, i.e. use of local materials.</p>	<p>–Vent pipe needs to go above the roof.</p> <p>– water tank next to Ecosan compost pit will add humidity to compost pit – not good</p>	<p>Lattice on windows on side</p>

9. A.R.Mahendran

+Good technical point

+Bamboo rafters

+ Slanted vent pipe to solve the problem of the vent pipe running through the middle of the ventilator. Another option would have been to shift the ventilator to a side.



10. R.Mahendran



+Good technical point	-Bad technical point	Aesthetic input
Slanting Vent Pipe		



11. Muniyandi Third Prize winner



+Good technical point	Aesthetic input
<ul style="list-style-type: none"> +Nosing on steps; +Vent pipe correctly placed; +Overhang of roof given; +Projected chamber plinth; +Bamboo rafters; +Location of the FIN ad was on the left as against the conventional right side and hence the ad was not obscured when the door was kept open. 	<ul style="list-style-type: none"> + Beer bottles for ventilators; +Tile chips on footrests;



12. Nanda Kumar



+	-
+Overhang of roof present +Bamboo rafters.	Vent pipe incorrect;

13. Poornachandran



+Good technical point	Aesthetic input
+ Slanting Pipe for vent – the first innovator; +Casurina poles for rafters	+Tile chips on steps

14. Raja

+Good technical point
+Overhang in front
+Gap between wall and roof for ventilation

15. Raman



+Good technical point	-Bad technical point
Bamboo rafter with blocked ends to prevent pests; PVC bends in pipes	vent pipe narrow stopping at ventilator



15. Ravi Kumar
Special Mention Prize

+Good technical point	-Bad technical point	Aesthetic input
+Vent pipe ok; +Old metal pipes for roof;	No overhang??	- Lovely decoration- does not look like toilet from outside - Interesting colour combination for the façade and the back wall.



16. Sellaiyan



+Good technical point	-Bad technical point
+Bamboo rafters	-Vent pipe not over roof
+Urine being collected in a pot	- Garden not adjacent.



17. Thandayuthapani - First Prize winner



+	-
<p>+He has had the courage to be different building an excellent thatch roof;</p> <p>+ Gap between walls and roof, allowing for good ventilation;</p> <p>+Shelf inside;</p> <p>+Colour coded squatting sides.</p>	<p>Vent pipe to be thicker and to be taken over the roof;</p>



6. CONCLUSIONS AND FOLLOW-UP

There are two major conclusions.

First, there is a real need to 'signal' competence in masons for the construction of ecosan toilets. Just because it is 'simple technology' does not mean it can be made correctly by unskilled people or by giving training to masons for a week as it is the case today in sanitation programmes. Such a strategy is leading to badly built toilets that become dysfunctional due to technical faults and are therefore abandoned over time.

Second, there is a real problem of 'repugnance' of consumers to the idea of having a human-waste recycling toilet next to their homes. This cannot be wished away and efforts need to be made to demonstrate the benefits of ecosan and the ease with which it can be integrated as a part of a residence, in order to aid its diffusion in India.

Therefore as a follow-up we must think of ways by which we can accord 'certificates of competence in Ecosan toilets building' to masons who really know the craft in an objective and scientific fashion. Second, we must have more of such contests to promote 'learning' and 'motivation' among the masons community to arrive at better designs of Ecosan toilets. The creativity potential of masons remains largely untapped both by themselves and the NGOs or government agencies employing them.

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- ❖ S. Paranjyothi (on left) and V. Ganapathy (of right) of FIN for their organization of the event.



❖ The judges! And the impromptu lecture given by Gita to the masons.



❖ The dignitaries who graced the occasion such as the collector of Nagapattinam C. Munianathan



❖ And the masons themselves !