



FINISH

Financial Inclusion Improves Sanitation and Health

Note on the International Sanitation Contest

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By

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THE FINISH SANITATION INNOVATION CONTEST OF 2011

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1. Introduction: Rationale for the contest

Safe sanitation must meet the needs of the user, be simple to use, to maintain and repair, be possible to replicate and be affordable. Given the hundreds of thousands of fossils of abandoned and stinking toilets in the developing world, it is imminently clear that among other factors, the inefficient use of toilets and their abandoning is due to a bad fit of the existing sanitation systems to different environmental and social–economic conditions and water availabilities. **Our central hypothesis is that complete and safe sanitation coverage cannot occur in India or in other developing countries, without a better identification of appropriate toilet technologies.** There is a huge potential for improving the designs of existing toilet systems and introducing new functionalities for harvesting and treating water along with the structure of a toilet. **But, to the best of our knowledge, there are no organizations, public or private, devoted to the generation of innovations and improvement of design in low cost household toilets.**

In the above context, to fill this lacuna, under the aegis of the FINISH programme, the present group launched the ‘FINISH sanitation innovation contest’ to generate innovations in terms of a *novel design* and/or *novel choice of materials* used and/or a *new process* and/or any other component of rural low-cost toilets. Clearly, one of the reasons for the lack of innovations in low cost toilets is that new designs of low cost toilets are unlikely to be patentable or have great commercial value. Hence, we wanted to experiment with a ‘scheme of cash prizes’ to see whether it would mobilize effort.

Programme **FINISH** stands for **F**inancial **I**nclusion **I**mproves **S**anitation and **H**ealth and is being supported and implemented since 2009 by an Indian-Dutch consortium comprising insurance companies, banks, academic institutions and NGOs from the two countries. Its objective is to diffuse 1 million safe sanitation systems (i.e. toilets with proper treatment of waste produced) to low income communities in rural India through mobilizing funds from end-user households.

Like in all sanitation drives, for economic viability, the partners of programme FINISH have to attain quantitative targets within a given time period. Their definition of a ‘safe sanitation system’ can often be challenged. However, they are all motivated to build safe and sustainable sanitation systems. Regular training is given to raise awareness. The innovation contest was especially designed to help tackle the difficulties faced by the members of FINISH that had been voiced.

2. Methodology: Steps followed

Firstly, in April (8-9) 2010, at the bi-yearly FINISH workshop on Sustainable Sanitation Systems in Ooty India, all MFIs partners, experts, sanitation drive supervisors and masons were invited to give their views on the shortcomings of the present models. Then, they were split into small groups to identify “challenges” in sanitation systems. In the last half-day of the workshop, each group had to present the challenges identified and these were compiled and summarized on the spot by **Ms. Gita Balakrishnan of ETHOS, an architect, who had been invited to oversee the design of the contest.** Another invitee to the workshop

was **Mr. Madhu Mani of IDEAKEN, a software engineer and co-founder of the start-up IDEAKEN**, who had expressed interest in collaboration, **to build the digital platform for contest implementation**. (Details of all members of organization committee is in the appendix).

Secondly, over the next six months, over skype meetings, the core committee comprising Valentin Post, Shyama V. Ramani, Gita Balakrishnan and Madhu Mani did the following:

- formulated a document outlining the challenges as compiled from the previous workshop; (see details)
- prepared a set of explanatory documents for contest participants;
- compiled a set of judges (see appendix for details);
- Ideaken built the digital platform for contest launch;
- The others tested this platform.

Thirdly, the contest was launched on Nov 19, 2010 to commemorate ‘World Toilet Day’ in Delhi. Emails were sent to the social and professional networks of the core committee members to inform them of the contest. There were also a press Release on Business Wire, PRWeb and partner web sites (WASTE, FIN, Ethos, ideaken) as part of launch. Shyama and Gita worked with the volunteers from UNU-MERIT and Maastricht University to make a grid for judging, which were then dispatched to the judges. The contest ran from 19th November 2010 up to 28th Feb 2011 for solvers to send their solutions to Ideaken.

3. Contest design

See the Introductory video on FINISH by Howard Hudson at <http://www.merit.unu.edu/> under Events & networking 'FINISH: Sanitation Challenge'

3.1. Identification of challenge areas

Participants were asked to deliver innovations in **one or more** of the following **5 Challenge areas of sanitation systems**.

Challenge area 1: Propose a **new and complete model** of a sanitation system for a location in India. See table above in information for step 1 for more details on this challenge area.

Challenge area 2: Innovate in the **component(s) of the superstructure** of the sanitation system (excepting toilet slab) in terms of walls and roof and floor and any complementary installations inside or outside the toilet for promotion of privacy and hygiene.

Challenge area 3: Innovate in the **component of toilet slab or seat** for user.

Challenge area 4: Innovate in the component of **structures for collection / treatment** of waste.

Challenge area 5: Innovate in the **component of treatment of waste (process)**.

A detailed guide with possible suggestions for thinking about innovations was provided for each of the sections (see appendix for details).

3.2. Criteria for judging

A set of criteria was identified by Gita Balakrishnan of ETHOS in collaboration with the students of UNU-MERIT for judging the entries. For each challenge a set of features were identified and each was given a number grade. For each challenge area the grades were added up. Some of the judges found the grading too detailed. They preferred to simply rank the entries in each challenge area. For example for every challenge area they ranked the top three entries: 3 (for best), 2 for (OK), 1 (acceptable) etc.

3.3. Details of grading for each challenge area

Challenge Area 1 – Best Complete System -

Waste Management – Should include the design of the system, the uniqueness/originality of design (**with respect to existing systems**); the cost, the ease of execution, environmental sensitivity (**geographical specificity, what is it doing to the soil around it**), maintainability (replicability (**is it a design that can be taken to different locations**)) and adaptability (**whether the design is meant for the conditions targeted by the candidate or others**). 40 points

Superstructure – Appeal, cost, innovation in materials used, Barrier-free design (**accessed by all including handicapped**), maintainability, environmental sensitivity (**use of locally available materials**), social sensitivity (**whether it will encourage or discourage people to use it**); compatibility of superstructure to the waste management system (**how is it compatible with the rest of the system**). 40 points

Context – Suitability for the geographical location (**is it compatible with any targeted condition mentioned in excel sheet**), site conditions, populace etc. 20 points

Ease of Use – (**using and disposing waste – are there any issues that have been tackled to facilitate ease of use?**) 20 points

Maintenance – of both the waste management system and the superstructure 20 points

Environmental Sensitivity – although this forms a part of both the first two categories, I thought it should have some separate points too. 20 points

Special Innovation (**The WOW(!) feature if any**) – Any new thoughtful features to the design that are not an absolute necessity but definitely add value. 20 points

Challenge Area 2 - Best Super-structure Design

- Superstructure – [innovation in materials used, Barrier-free design] = (40 points);
- context and social sensitivity (30 points);
- maintainability (30 points);

- environmental sensitivity (25 points);
- cost effectiveness (25 points);
- compatibility of superstructure to the waste management system (25 points);
- Appeal & Attractiveness – to spread a message and increase Covet factor (20 points).

Challenge Area 3 – Innovation of Toilet Slab or Seat

- Design -Ergonomics – Ease of use; Water Consumption 30 points
- Maintainability 30 points
- Cost 20 points
- Ease of Manufacture 20 points

Challenge Area 4 – Innovation in Collection and Treatment of Waste

- Suitability of design Innovation in handling different forms of waste solid, liquid and gas (e.g. what will be impact on smell) 50 points
- Maintainability 30 points
- Innovations to handle different steps in the process (Such as alternatives for ash, urine disposal etc) 20 points

Challenge Area 5 - Innovation in the treatment of the waste

- **Environmental Impact 45 points**
- **Possibility of Revenue / other Value generation 35 points**
- **Social Acceptability 20 points**

3.4. The Judges

3.4.1. France: François Brikké,

Mr. François Brikké a French national, is currently working with UNICEF Indonesia as Chief Water, Sanitation and Hygiene. From 2004-2008, Mr. Brikké was based in Lima, Peru, as Regional Team Leader of the Water and Sanitation Program – Latin America and the Caribbean (WSP-LAC), administered by the World Bank. Mr. Brikké, is both a socio-economist and a sanitary engineer and graduated from the Faculty of Social Sciences of the University of Nancy (France) and the Institut des Sciences de l'Ingénieur of Montpellier (France). He has had more than 20 years of experience working with or in developing countries of Latin America, Africa and Asia. His experience in the water and sanitation experience started in 1992 at the IRC International Water and Sanitation Centre, where he worked as a Programme Officer in charge of the development of policies and guidelines on sustainable provision of services. He then created his own consultancy firm in 1999, “Dialogue and Development”, based in France, where he specialized in sector policy formulation, reforms, decentralization, SWAPs development, and monitoring.

3.4.2. India : Mr. Vasudev

Mr. Vasudev graduated in 1976 as a Mechanical Engineer, and joined M/S ATLAS COPCO, a Swedish leader in the field of exploitation of underground sources of water. After working in M/S Atlas Copco for over 9 years, he decided to set up his own business and started a company specializing in 'Plumbing Works'. He executed many large projects during this period, as one of the leading plumbing contracting companies with engineers heading it. Alongside he was invited to join an emerging specialist company in the field of swimming pools as their 'Technical Director' and went on to make news in the field of swimming pools, by introducing 'Vinyl Lined and Gunited Pools' to the Indian market, apart from designing the water treatment plants etc. for swimming Pools. During his tenure he was also responsible for setting up over 100 swimming pools all over the country. However, realizing that contracting was not his cup of tea, he created yet another firm: 'Atreya Consultants' a company specializing in providing 'Design/Drawings for Plumbing, Fire fighting, Swimming Pools' etc, which has been his mainstay since 1989. Bringing in expertise from the mechanical engineering industry and coupling this to the requirements of the civil construction industry has been a great challenge as well a very satisfying journey for him.

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3.4.3. India : Ms. Chitra Vishwanath

Ms. Chitra Vishwanath is a practising Architect for the last 20 years focussing on Ecological Architecture. www.biome-solutions.com Her specialisation is on earth architecture and most of her designs incorporate rainwater harvesting and waste-water reuse. She has developed a eco-san pan design for Indian use. Apart from running a practise, she has also been teaching a cross cultural design school with the University of Berne.

3.4.4. India : Mr. S. Vishwanath

Mr. S. Vishwanath has been working on sustainable water issues since 24 years including especially rainwater harvesting. www.rainwaterclub.org He is involved in policy and advocacy work on rainwater harvesting at city scale. He is also a freelance writer in 'The Hindu' with a column called 'Waterwise' for the last 3 years. Youtube/twitter handle 'zenrainman'

Biome Solutions Pvt. Ltd.

team encompassing specialisation in Ecological Architecture , rainwater harvesting and sustainable sanitation

www.biome-solutions.com

3.4.5. South Africa : Mr. Walter Johannes

Mr. Walter Johannes is a Technical Director in Aurecon responsible for the design of water and wastewater treatment works. He has more than 25 years' experience in the sanitation field and he has been involved in all forms of Sanitation, ranging from high level waterborne sanitation, to basic on-site sanitation systems. He holds an M Eng. in Water utilisation from the University of Pretoria.

Aurecon provides engineering, management and specialist technical services for public and private sector clients globally in more than 70 countries across Africa, Asia Pacific and the Middle East. Created through the merger of three leading engineering consultancies, Africon, Connel Wagner and Ninham Shand, Aurecon has more than 6000 professionals offering in-depth local market knowledge combined with international expertise.

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3.4.6. India : Mr. Anand Ganeshan Iyer

Mr. Anand graduated in Chemical Engineering. He holds a Post Graduate in Ecology and Environmental Engineering. Worked for 13 years in manufacturing sector and 18 years in the field of Environment and Ecology with focus on Total Water Management, Pollution Control, Water Treatment, Sanitation and Environmental Impact Assessment. Head of Environment Engineering Division of a firm till 1995. Currently heads own consulting firm, The Solutions Centre. Clients include airports, hotel, residential complexes, industries, local governments and organisations like UNIDO and FAO.

4. Outcomes of the contest

4.1. Participation Outcomes

The registration and participation details are summarized from the presentation of Madhu Mani (Ideaken) at the prize giving ceremony.

- **A total of 3002 views were generated for the contest which is around 2500 “unique” individuals.**
- **A total of 417 “unique” individuals read the complete challenge, out of which 109 signed up for the contest.**
- **Out of the total of 417 solvers, 301 or 66% were from India. USA was the next largest with 37 solvers viewing the challenge.**

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Overview »

FINISH Sanitation Challenge Report

Nov 19, 2010 - Feb 28, 2011

This graph represents the trend based on filtered dimensions but not on filtered metrics.



This custom dimension resulted in 3,002 Pageviews via 1 page titles

Filtered for page titles containing "FINISH Sanitation Challenge" and page titles excluding "Link to FINISH Sanitation Challenge"

New tab Views: [Grid] [Table] [List] [Full]

Pageviews 3,002 % of Site Total: 8.63%	Unique Pageviews 2,534 % of Site Total: 8.70%
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Overview »

FINISH Sanitation Challenge Report

Nov 19, 2010 - Mar 1, 2011



This custom dimension resulted in 456 Pageviews via 1 page titles

Filtered for page titles containing "Challenge C-0111"

New tab Views: [Grid] [Table] [List] [Full]

Pageviews 456 % of Site Total: 1.30%	Unique Pageviews 417 % of Site Total: 1.42%
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Page Title	Pageviews	Unique Pageviews
1. Challenge C-0111-0101 - Seeking innovative sanitation system design suitable for mass rural installation	456	417

Filter Page Title: containing Challenge C-0111 Go to: 1 Show rows: 10 1 - 1 of 1

Country/Territory	Pageviews	Pageviews	Page Title contribution to total
India	301	66.01%	
United States	37	8.11%	
Netherlands	10	2.19%	
Italy	8	1.75%	
United Kingdom	6	1.32%	
Pakistan	6	1.32%	
Germany	6	1.32%	
Russia	5	1.10%	
Cambodia	5	1.10%	
Spain	5	1.10%	

4.2. Winners

There were 13 final entries, out of which 11 were complete in all respects. Of the 11 entries, 6 entries were selected for awards as follows.

1st prize in systems : No. 64: Combined shower, urine diversion, dry latrine and drip irrigation system to Benjamin Clouet of IDE - Cambodia 6000 Euros

1st Prize in superstructures: No. 34: Cook & SOAPI integrated system with rainwater collection, separation of urine / faeces, and production of biogas to JELMER trainees, Netherlands 1750 Euros

Second prize systems: 61: Easy (to buy, build and use) latrine to Yi Wei of IDE - Cambodia 750 Euros

Second prize collection systems: 41: Plastic liner to Dylan Marriner of USA 750 Euros

Second prize superstructures: 16: Dry composting toilet building for schools or other public facilities to Henry Hill Pierce of USA 750 Euros

Implementation award to 75: SCOPE UDDT or ECOSAN model to M. Subburaman No cash prize but funds will be raised to implement the winning models in the town of Musuri where Mr. Subburaman operates SCOPE.

5. Analysis of winning entries

The evaluation of the judges was used by Valentin Post of WASTE and Gita Balakrishnan of ETHOS to decide upon the winners according to the following logic.

1st prize in systems

5.1. Combined shower, urine diversion, dry latrine and drip irrigation system.

What is striking in the entry: The incorporation of a shower shows the insight of the contestant. Sanitation does not start and end with a toilet. Considering the fact that rural populations look more and more for solutions that are not only responding to their sanitation needs but also to their personal hygiene needs, this option offers the possibility of combining the two in an innovative and cost effective way, through the combination of shower (grey water disposal) and urine.

What makes it innovative: This sanitation design offers the possibility of a drip irrigation system, using water run-off from the shower together with urine that allows for gardening and therefore income generation activities. The fact that there is no direct handling of urine (that has proven to be cumbersome in many projects) is a true and clever innovation. It also allows for a rapid dilution of urine in the water run off, therefore avoiding discomfort.

What's already known: The use of a double pit is a tested solution for sludge management at community level, avoiding unsafe handling and providing sufficient time for sludge maturation into compost to become usable as fertilizer, through the alternate use of pits.

What makes it replicable: As a whole, the devise is simple, easy to build, relatively low cost, and possible to manufacture within a community using local tools and skills. The technical guidance manual that was provided is already well done and user friendly.

What needs more thought: What requires some improvement is that a somewhat larger and different type of filter should be included in the design to deal with soaps etc emanating from the showers. Also the segregation between shower and toilet area will require local fine-tuning. Finally the distance between the pits will need to be enlarged.

Yet this option is the most innovative one as it offers a comprehensive system that responds to personal sanitation, hygiene, ecological, income generation needs at a relatively low cost. It offers a high potential of scaling up. Congratulations to the innovators.

1st Prize superstructures

5.2. Cook & SOAPI integrated system with rainwater collection, separation of urine / faeces, and production of biogas.

What the entry is: This integrated sanitation option can, according to its designers, be done at household and / or community level, offers the possibility of collecting water for multiple hygiene and horticultural purposes. It separates urine and faeces for their subsequent reuse, the latter either for fertilization or the production of biogas.

What's known already: The technology is basically UDDT with biogas plant and in that sense has only a limited innovative aspect.

What is innovative: The household and / or community option is an original idea. The technical feasibility of upscaling and downscaling is indicated, yet this is unknown at present. Nevertheless the concept is quite comprehensive (including use of rainwater harvesting) in its outlook.

What else is attractive: It is attractive in its integrated concept and in its use of sustainable products for its construction, such as protected cardboard, sandwich material of corrugated fiberboard skins, lightweight but stiff honeycomb cardboard, cardboard tubing. Though this material may or may not be readily available, whenever it can be had, it could reduce the cost of the superstructure significantly. In addition, it has integrated rainwater harvesting to the superstructure design.

What needs further thought: Though applicable to individual households, it will be better suited to groups of households as community toilets, as the production of faeces from a sole family is not sufficient to have an effective and efficient production of biogas. Thus, at Communal / neighbourhood level, this becomes more interesting. Economies of scale could be gained as well for the initial investment in building the system.

In conclusion, this system is innovative in the sense that it integrates many aspects of sustainability, and uses unusual material, hence we congratulate the designers on their solution and award them first prize in the category superstructure

2nd prize in systems

5.3. Easy (to buy, build and use) latrine

What is innovative about the entry: The innovative aspect of this sanitation option is its easiness to build and use as well as its low cost for a good quality product.

What is not innovative about the entry: The technology as such does not represent any major innovation, and hence it cannot compete for first prize.

How we see the innovation: Yet we place its innovativeness more in the way this product has been studied from both demand and supply side and subsequently marketed. Usually, latrine and sanitation products are sold using shame and blame techniques (Community Led Total Sanitation), or using health / comfort / status criteria, but they are rarely sold as an easy and friendly accessible product.

What we appreciated: The story of Cambodia shows that this marketing technique is working. The details and reference material provided does facilitate an easy replication.

What is missing: The author should also have described the upstream work that needs to be made for manufacturing, marketing and distributing purposes.

In conclusion, this sanitation option could help to scale up rapidly the efforts to improve Sanitation MDGs through development of the supply-side chain in tune with demands of end-users. To succeed beyond the marketing potential, it should include an integrated aspect to sanitation development.

We congratulate the contestants on their solution and award them second prize in the systems category for the marketing potential it offers.

2nd prize collection systems

5.4. Variation on Vietnamese double vault composting toilet

What the entry is: The solution describes a urine diversion composting toilet. In essence the solution would be a minor diversion from the well-tested Urine diversion dehydration toilet as promoted in India.

What is innovative: Instead of building above the ground chambers the designers are suggesting to dig holes that can function as chambers. The real innovation in the design lies in the choice of material, i.e. HDPE 30 mil. This could reduce construction costs.

What is already known: HDPE 30 mil appears to be a trademark. However there are several companies in India making HDPE liners and local offers could be obtained too.

What we agree about: They correctly state that superstructures should be as per the user preferences and wishes and preferably be low cost (unless the users desires otherwise, and pays for it, of course).

It is believed that the widely practiced anal cleansing in India would not cause insurmountable operational problems, though if it does a three hole slab would be a solution.

What needs more thought: We would like to clarify with the designer how he /she foresees the emptying of the vault as it is dug in the ground and may not be easily accessible for emptying.

Furthermore we would also like to clarify how the designer proposes to protect the HDPE from perforation by sharp objects in the soil or during emptying of the vault.

The jury was highly divided on this solution. As some of the jurors were impressed with the recommended use of plastic liners as a way to reduce costs, we decided on second prize in the collection category.

2nd prize superstructures

5.5. Dry composting toilet building for schools or other public facilities.

What is innovative: The design adopted has highly original ideas like an easily operable tank switching system. This option is innovative; it uses the high temperature principle generated by black metal painted chimney for the killing of human pathogens in a very daring and innovative technical design, as well as an intelligent cross-ventilation and use of rainwater harvesting.

What is well known: The approach is standard UDDT.

What is missing or requires more thought: There is limited information on building costs and skills required in construction. The designer should clarify how the air will pass through

the toilets to the vaults below as most of the time the vaults will be closed / toilets will be sealed. The metal plates of the tank switching system should be corrosion proof.

Whilst the drawings offer some explanation it is rather complicated for the jurors to see how it could be built in practice, thus we award the designers second prize in the superstructure category particularly for the cross ventilation aspects, and the details of the switch system as well as the attention given to pathogen elimination through high temperature.

We congratulate the contestants on their solution and look forward to further interaction.

5.6. Implementation award to: SCOPE ECOSAN model

What is innovative: Although in a way, this proposal is rather “orthodox” in terms of the application of the ECOSAN principles, it offers an innovative variation (3 in 1): a) urine collection done through mud pot with holes buried in the earth; b) wash water collected separately; and c) drop hole for faeces.

What is well known: SCOPE proposes a model based the implementation of the innovative ecological sanitation concept and philosophy.

What we appreciated: SCOPE rightly highlights the important component of hygiene and sanitation education. It also explains how to use and maintain a UDDT / ECOSAN, based on practical experience.

The cultural dimension is essential and should be tackled as well; water is used for every act of cleaning and there is a strong taboo in for instance Indonesia about the reuse of human faeces (unlike in China or Vietnam). This situation could be the same in some areas of India, especially in the northern part.

In conclusion, this option presents a possible variation of the classical model of ECOSAN based on the innovative principles of ecological sanitation, using local material for its construction. In a way, this option or should we say this approach remains innovative, but to spread more readily outside its area of operation still has to address more thoroughly the cultural issue to ensure its success.

Thus we congratulate SCOPE with the achievements in Southern India, we gratefully acknowledge the details provided and award SCOPE the special implementation award.

6. Follow-up

We could have stopped at this point. Selection of the winners, awarding prizes and distributing the prizes could have been the end to it. **Yet this exit route never really crossed our minds.** We consider it a new challenge and one we need to take upon with the winners – namely how we can put their ideas into practice. Secondly, this also gives more meaning to the implementation award.

Following some deliberations we are opting for a short and a long route. Both of the routes converge in the small town of Musiri on the banks of the Cauvery River in Tamilnadu. Few people would give Musiri a second look; it is a sleepy town; not having any important historical or religious monuments, not too important from a logistical point of view either. Yet it has attracted news stories from BBC and CNN, nearly all the Indian dailies, many important local visitors and to top it all – many foreigners too.

So, what is it they seek in Musiri? The answer is perhaps surprising: toilets. Musiri houses the first get paid for use public toilet, India's first sludge treatment plant, different types of school toilets, many different types of toilets from urine diversion to single pit, and to boot this also those that generate biogas. This remarkable diversity and variety is caused by a sanitation pioneer on the one hand and the farsightedness of the town Panchayat on the other.

This sanitation pioneer is none other than Mr. M. Subburaman, indeed the founder of **SCOPE Society for Community Organisation and People's Education (SCOPE)** in 1986 and the winner of the implementation award. Post World Water Day the prize winner and the organisers worked out a scheme how their designs could be implemented.

As part of the short route, the designs of the winners with suitable and agreeable modifications will be implemented in the town of Musiri on a pilot basis. The route is short, as all these should be implemented before World Toilet Day 2011 (19 November)

In the long route the modified / adopted designs will form part and parcel of a plan that is put to the Government of India amongst others: the Musiri sanitation science and technology park. The Musiri sanitation science and technology park will be a blue print of all different types of systems presently operational in India, the place for new systems to be tested, the first town to achieve open defecation free status. Another interesting feature herein is that all these systems will actually be used, so user problems can and will be tackled too. Thus, the innovations of the prize winners will feature right alongside rehabilitation of public toilets, use and get paid toilet, the urine bank, sludge treatment, small town sewer and treatment, biogas generation and so on.

7. Details on organization committee

7.1. Gita Balakrishnan (*ETHOS*)

Ms. Gita Balakrishnan A graduate from the School of Planning and Architecture, New Delhi, Gita Balakrishnan completed practical training at the Centre for Building Performance and Diagnostics at the Carnegie Mellon University, Pittsburgh , USA . She underwent a training programme on Stabilized Mud Blocks and other alternative methods of construction at Indian Institute of Science Bangalore. She has designed and constructed many buildings using alternative methods of construction in Bangalore. She worked with an NGO, AVAS – as a shelter coordinator in the slums of Bangalore. She is now a trustee of AVAS. She moved to Kolkata in 2001 and started *Ethos* with the intention of making the architectural and civil engineering community alive to the changes happening globally and in our country in the field of architecture and construction. Ethos reaches out to around 10000 students of architecture and civil engineering from around 400 college across India through interesting events. The flagship events of Ethos are [Archumen](#), a quiz on architecture and [Bending Moment](#), a quiz on civil engineering. Ethos also organizes design competitions such as

[Transparence](#), **SAVE AS YOU BUILD** and [IGBC Green Design Competition](#). Archumen was conducted in Sri Lanka in 2006 and an episode was hosted at Lahore during the students' jamboree at the Asian Congress of Architect in 2010. Log on to www.ethosindia.in.

7.2. *Madhu Mani (IDEAKEN)*

Mr. Madhu Mani – Armed with an University Gold Medal in Master of Computer Applications, Madhu started his professional career with BFL Software. He soon got an exciting offer from then a small company - Wipro - who were just beginning to find their feet in the IT industry. That was the start of a long journey that took him from Delhi to USA to UK and even continental Europe - consulting for different companies and helping them service their IT requirements. After 13 years of working with different customers from financial institutions to large telecom companies, he missed the excitement and nimbleness of a startup. He also noticed how the web had changed the world and globalisation had affected the way in which we carried out our work today. This led to starting ideaken, with a few of his friends. Today as part of a start up IT company ideaken, he works with large companies and help them innovate through the use of technology.

7.3. *Valentin Post (WASTE)*

Mr. Valentin Post, a Dutch national, obtained a double Masters degree, first in quantitative development economics; and then second, in the history of agro-metropolitan societies from Erasmus University in Rotterdam (1987-1993). He carried out extensive fieldwork in India in writing the dissertations of these two degrees. Then from 1993 to 2001, he worked in UNIDO (United Nations Industrial Development Organisation) on various projects related to waste management, gaining intimate knowledge of the problems of South Asia. At this point, he took a study leave to pursue an MBA in Environment at the University of Twente (2000-2001). He then returned to UNIDO as a consultant till 2004. After a brief stint with Kilian Water and the Central Environment Authority of Sri Lanka, he joined WASTE as a Senior Advisor and Controller. He is currently responsible for managing projects related to: Waste innovative financing, Waste Ventures Fund and Micro finance and sanitation project (BISWA-SNS REAAL)

7.4. *Shyama V. Ramani (UNU-MERIT & FIN)*

Ms. Shyama V. Ramani (ramani@merit.unu.edu shyama_ramani@yahoo.com) is Professor of the Economics of Health, Life Sciences and Development, UNU-MERIT and Maastricht University, The Netherlands. She obtained her Ph.D. in economics at Cornell University, USA with the Andrew D. White Fellowship in 1989. Her fields of specialization are the economics of innovation, development economics and applied game theory. A firm called 'Tecknowmetrix' has been created in France on the basis of her publications on technology indicators and she is one of its co-founders. After the Tsunami of December 2004, she also created two non-profit organizations, Association 'Un Ami in France' and 'Friend in Need' in India, to help an isolated fishing village named Kameshwaram along the Indian coastline, attain the millennium development goals. She was one of the laureates of the trophy 'Women of the Earth' in 2008 awarded by the Institut de France and Yves Rocher Foundation.

8. Contact for further enquiries

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