Open discussion on MOSAN toilet design

Posted by Mona - 10 Oct 2012 14:44

Hello everyone,

I am the designer of the portable sanitation solution MOSAN, which was designed for the urban poor in 2011.

MOSAN is an urine-diversion dry toilet which is used in a sitting posture. The toilet has 3 main components: a main pot, a separation toilet seat and a lid. There are two inner containers for excreta collection.

The toilet only collects excreta, no flushing water, no anal washing water or any kinds of waste should be added. Faeces has be be covered properly with dry material like ash or saw dust. This avoids smell, keeps faeces dry (reduces pathogens) and makes the content less unsightly for the next user.

In December 2011 we built 2 functional prototypes in Germany. One is currently exhibited at GIZ headquarters in Eschborn. For more information about the prototyping process in Germany, Bangladesh and our work, please read the topic " moSAN - mobile toilet for the urban poor in Bangladesh " or have a look at our tumblr blog
mosan-bangladesh.tumblr.com

In May 2011 simple prototypes were tested for 4 days in Bangladesh and in summer 2012 two willing users, one male and one female, tested one advanced prototype in Germany (see pictures below). The test results will now be used for a redesign and further development of the concept.

In this regard we would also like to get YOUR FEEDBACK. What do you think about the toilet design?

We would like to discuss ideas and sketches to optimize the MOSAN toilet to become the most desirable toilet on earth

==========

Open discussion on MOSAN toilet design

Posted by christoph - 18 Oct 2012 10:53

Hi Mona,

have a look at the construction manual we made

www.susana.org/docs_ccbk/susana_download...ultrotariaperuen.pdf

page 14 gives some aspects to look for and erros to avoid.

(Thanks Trevor for the advice how to insert a picture)

Yours

Christoph

==========

Open discussion on MOSAN toilet design

Posted by christoph - 18 Oct 2012 11:18

_____

Dear Dave,

This topic might move to be a new topic (Service models) but I will answer it here. First of all I would like say that I´m happy to hear that the number of groups trying out service models is growing and I totally agree with an idea, that in early stage it has to done by people who have the strong will to overcome problems – which are normal to a new approach. But I disagree with you when you write “I would not trust this to the municipal authority”
.

How about water supply, don´t you trust the municipality on that? How about sewage systems? How about garbage collection?

I don´t discuss with you the severe failures there are. We have to work on that in order to get better. In my opinion the municipal authority is THE ONLY solution to go to scale. How they do it, by outsourcing to a private, maybe an NGO as well, by building up an area, by integrating it with their sewage or garbage service…. those are all models to be tested out and probably they will exist side by side as there are lots of models how to provide sewer borne sanitation. But **the responsibility for sanitation has to be with the municipality!**
By most laws and regulations the responsibility for sanitation is by the municipality. You might answer that the non sewer areas are not included. That is the crucial point. Most municipalities do not define the non sewer areas as their responsibility, but if we really want to see these systems in scale, the responsibility has to be with the municipality obligation of funding, possibility of funding, obligation of thinking about solutions.

Sorry eThekwini people, I have to mention you again. They took the responsibility for these areas and had to deal with large problems…you all know the story they are still struggling but they are on track and way ahead.

Yours

Christoph

P.S. I very much agree on your concern of the change o behavior squatting – sitting.

==========

Open discussion on MOSAN toilet design

Posted by DavidAlan - 18 Oct 2012 11:45

_____

We are in the early stages of our trials and as you say at this stage it may not be appropriate to involve the municipality (who do know what we are doing by the way), so I should have been clearer. In fact, our longer term plan is to create the template for local business people to run models like this, not local councils. I will continue to build a robust model that will appeal to investors as I believe this is the most likely way of reaching scale in many countries. In addition, the Tamil Nadu State Government is monitoring what we are doing and actively (and financially significantly) subsidising our rural village work.

But do I trust the municipality? Indian water and rubbish systems... Ummm, I will think about that one!

David

==========

Open discussion on MOSAN toilet design

Posted by HSO1 - 18 Oct 2012 11:48

_____

Please contact me on

This e-mail address is being protected from spambots. You need JavaScript enabled to view it

should you be interested in childrens UD pedestals.

Thank you

Guy

==========

Re: Open discussion on MOSAN toilet design
Posted by Mona - 18 Oct 2012 17:02

Dear Marijn,

many thanks for sharing your experiences. I really like the idea with colored beads. I can imagine this is a great way to get more people answering questions about sensitive topics like sanitation!

==========

Re: Open discussion on MOSAN toilet design
Posted by Mona - 18 Oct 2012 17:43

Dear David, dear Christoph,

many thanks for supporting this discussion and taking it to one of the most important points: the sanitation service! We are aware of the logistical challenge of a manual emptying service and treatment service. The process of emptying the toilet, collection from house-to-house and transport to the place of treatment needs to be as comfortable as possible. Using bags inside the toilet could be one solution to avoid smell during the steps of collection and transport. But for sure the collectors (and users) need to be schooled well and work very precise. Next month we will start designing a detailed service chain and plan trials for next year. We will update you with our ideas soon.

Also important to say: **we never planned or plan to change people's behavior**. We only reported that during our research in Bangladesh, even people with squatting habits showed great interest in a sitting solution. One family with a very clean superstructure squatting toilet in front of their house (provided by an NGO) wanted to test the MoSan toilet. The mother reported how comfortable it was for her children not to go out at night and be scared at the dark toilet. This example shows, that in some situations an in-house sitting toilet might be also a good solution for people with squatting habits (e.g. for elderly and people with disabilities).

But we will never convince people to use MoSan against their will or try to change their habits!!!

Hopefully one day urban slum dwellers will have the choice to decide between different innovative sanitation solutions

==========

Re: Open discussion on MOSAN toilet design
Posted by Mona - 30 Oct 2012 14:46

Hello everyone,

next year we aim to test the MoSan toilet in Africa, so we need to have some prototypes ready for shipping. Thats why we will produce 10 prototypes in Germany within the next 2 month, update and improve the design. Here some notes to the planned changes on the MoSan design and the sanitation service.

We decided to change the way of prototyping from manual laminating with fiber and epoxy to **vacuum forming (also called deep-drawing)**
with plastic sheets. It simplifies the prototyping process a lot and has many more advantages, e.g.

- the **recycling of the toilet itself is way easier**, since thermoplastics are used and the plastic could be recycled for new production

- the **toilet will be lighter** and all **surfaces will be smooth and water repellant**

- as a result the **cleaning of the toilet will be easier and more hygienic**.

One important change will be that all parts become **stackable**. That means we need to change the shape of the main pot and adjust all angles.

Another change is, that the toilet shall also be **usable for more than 24h without emptying**. Usually we planned the collection service collects inner containers every 24h. This is probably still the most comfortable solution for the users, since no smell will occur and the toilet never fills up completely. In cases, this service becomes too expensive or other problems come up, we will ensure the toilet is still be usable.

One idea is, to provide **additional urine containers/ bottles, for replacement**. All containers have screw lids and are "branded" with the
MoSan identity and logo
(which will be designed during the marketing phase).

Another idea is to attach a **tube which drains the urine into a big external container**. It might be worth a try to connect two or more households to one urine container.

We will also test the **usage of biodegradable bags** inside the faeces bucket. This means the inner toilet bucket will stay always with the family and only the bags are collected and transported off site. An **extra collection bin**
will be provided for storing full bags. The collection service will then pick up the storage bin and urine bottles or replace the bigger urine container shared by two families.

The combination of bags and multiple urine bottles or bigger external urine containers offers a **multiple day use of the MoSan toilet**
.

We are looking forward to your feedback!

Mona

==========

Re: Open discussion on MOSAN toilet design
Posted by Mona - 31 Oct 2012 15:56

By the way, I found a UDDT seat for children, which can be used with sitting toilets:

www.berger-biotechnik.de/trenntoiletten/...r-trenntoiletten.php

==========

Re: Open discussion on MOSAN toilet design
Posted by petersluk - 14 Nov 2012 11:24

Dear Mona,

I really like your product and I think its great that you are taking it through so many tests.

Just some general issues with the Prototyping, which you have probably already thought of:

- Since you say you want to make the product stackable you are probably thinking of changing the shape of the pot anyway to make the cross-section area (viewed from top) decrease towards the bottom. When designing this you should **consider minimum angles and thicknesses of material** for vacuum forming or deep drawing but you can best discuss this with the person operating the vacuum forming or deep drawing machine.

- If you are designing the product for manufacture what manufacturing processes are you considering for a final product? I think you might be able to do some interesting things with **rotational moulding.** You could make the whole thing out of one mould or two lids, two main pots out of one mould. You then simply cut it into the separate parts.

- Also consider adding ribs into your prototypes. They would make the final product stronger and long lasting but might effect the user interaction when cleaning.

I am currently working on a project that focuses on sanitation facilities for disabled in peri-urban areas in Zambia. I think your Idea of targeting the product at elderly or disabled is good. There are many who have difficulties traveling to pit latrines in wheelchairs or with Crutches on the uneven terrain especially at night and rely on others to take them. So for them a portable solution with a container that can be emptied by someone else would be ideal. However if you really want to target these groups you should consider designing extra supportive structures or something for them to hold onto and help them get onto the toilet from a wheelchair or the floor.

Regards Lukas

==========

Re: Open discussion on MOSAN toilet design

Posted by Mona - 14 Nov 2012 12:08

_____

Dear Lukas,

thanks so much for your precise advise. As you said, we are working close with manufacturers and learn from their experience. For their machines 1° is enough to release the parts easily from the molds, but my knowledge is that 2-3° work better, especially if we have no compressor unit for releasing. Do you have experience with deep-drawing in Zambia?

For the final production deep-drawing could be a cost-effective method and the results are of very good quality (depending on the plastics). Rotational moulding is a good option too, but the initial costs for molds are much higher than for deep-drawing. So the final method will relate on the scale of the production.

To add additional support for people with disabilities is very important too. Our idea is to design a railing fitted to the place where MoSan will be used. Either fixed to a wall or a mobile version standing on the

ground.

It is really nice to hear that you confirm our ideas and concepts from your point of view and your experience in Zambia. For which organization are you working? MoSan could be a great solution for peri-urban areas as well
Please stay in touch!

Best, Mona

==========

Re: Open discussion on MOSAN toilet design

Posted by petersluk - 20 Nov 2012 15:41

Dear Mona,

Im currently working in the GIZ water program in Zambia and my current task is to design a latrine for people with disabilities in Sambia. I am a Product Design Engineer and I have a little experience with deep drawing from projects in University but non in Africa or Zambia.

I tried to upload some videos of people with disability in the peri-urban areas here, that might help but it doesnt seem to work. So if you give me an email address i can try to send them to you.

Cheers,

Lukas

==========

Re: Open discussion on MOSAN toilet design

Posted by Mona - 20 Nov 2012 16:08

Great! I would love to get an insight in current habits in Zambia. Please upload the video on an external server, like www.ge.tt or in your public dropbox folder and post the links, so the SuSanA community can also watch the videos

Many thanks!

==========