Low-Cost Sanitation for Emergencies, tested in Haiti (Aerosan, USA and Haiti)

Posted by Ekane - 08 Feb 2013 22:51

Dear all,

Andrew Larsen of Fontes Foundation and his partners Andreas Koestler and Hana Nelson received a Bill and Melinda Gates Foundation (BMGF) GCE I grant to implement urban sanitation in Haiti.

I am introducing their work to the Forum in my capacity as one of the moderators.

Title of the grant: Urban Sanitation Solutions for High-Use, Flooded, and Difficult to Serve Areas

Short description of the project: the design is an urban sanitation solution which is low-cost, robust, aesthetic, deployable, and erectable in kit form for areas which have been previously very difficult to serve: high-density urban areas, refugee camps, and flooded areas - situations which are common in the aftermath of disaster.

Objectives: To implement sanitation in Cite Soleil (village of Vodrey), a slum area within Port-au-Prince, Haiti; to address the social and technical issues together with the community served; to use the lessons learned for the development of an erectable sanitation solution for use in disaster affected areas.

Goals: To complete several toilets and a compost system within the village of Vodrey; to demonstrate user acceptability of the sanitation approach; to work with the community through the complete cycle from toilets to a finished, usable product.

Start and end date: Research and preparation - May 2011-March 2012. Implementation - June 2012 to present.

Andrew and partners have so far installed four toilet blocks of five toilets each, operating in Vodrey, a peri-urban community within Cité Soleil- a large slum in Port-au-Prince, Haiti. The toilet blocks have been in operation since August, 2012. These blocks are constructed using local lumber using reused vinyl billboard fabric. The fabric is stretched around lumber frames to make an inexpensive, robust and weatherproof toilet cubicle. Then, five cubicles are placed together over a common collection bin, which allows the toilet block to be very stable, even in high winds and torrential downpours. The billboard fabric

is also used in the collection bin to form a bag (not shown in the drawing), that keeps all excreta from touching the ground. The stairs of each toilet extend to the ground forming wide support for the overall structure. A large, central ventilation plenum extending upward from the tops of the five cubicles enhances wind-driven ventilation.

Please read the attachment for more information about the successes and challenges of this project. We welcome your questions and comments on this project.

And here is a link to Andrew's presentation at the FSM-2 Conference in Durban in October 2012 as well as other documents:

www.susana.org/en/resources/library/details/1716

Best regards,

Nelson Ekane

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by F H Mughal - 10 Feb 2013 06:58

Dear Mr. Nelson,

That was an interesting issue that you discussed. One of the impacts of climate change is heavy flooding. During the recent floods in Pakistan, the toilets in rural areas were badly affected. Not on the sanitation side, I was told at an Asian Development Forum in Manila that the floods in Thailand flooded chemicals of a water treatment plant, causing major concern among the public.

Building sanitation facilities now require consideration of climate change impacts. It is here that your work is helpful. The height of the toilets and, probably, the toilets' foundation may not withstand the flow of rushing flood waters. Please comment on this aspect. Also, I would request you to kindly develop detailed, in-depth hands-on manual on construction of toilets under the flood conditions. I'm sure the proposed document would be of great help to us all. Thanks for the good work.

Regards,

F H Mughal (Mr.)

Karachi, Pakistan

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by Ekane - 11 Feb 2013 18:21

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Dear Mughal,

Thanks for your comment. Providing sanitation solutions in disaster-torn areas is very challenging. However, if we have information on the potential high disaster risk areas, then we may be able to plan for resilient systems. How is the sanitation situation today after the floods in rural Pakistan? What type of toilets are presently being used?

Presently, there is an increasing interest in disaster risk reduction (DRR)among some water and sanitation experts and donor agencies. At Stockholm Environment Institute (SEI), we have the WASH and RESCUE research project which focuses on DRR. Read more about this project in the link below:

forum.susana.org/forum/categories/61-wg-...ches-wash-and-rescue

I agree, a manual on construction of toilets in disaster conditions (not only floods) is highly needed. I am sure Andrew Larsen and colleagues have this in plan from their work in Haiti. I would like to invite Andrew and colleagues to join this discussion and comment on such a manual as well as on the design of the toilet they are implementing in Haiti.

Cheers,

Nelson Ekane

Stockholm Environment Institute (SEI)

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by F H Mughal - 11 Feb 2013 18:45

Dear Mr. Nelson,

Thanks for response. In rural Sindh, Pakistan, sanitation is not quite in order. Pit latrines are, quite often, used in the rural areas. Due to the heavy pressure exerted by massive flood waters, they were washed away and, sanitation simply became nonfunctional.

Climate change is a reality and floods will come again here. Building toilets that take into consideration the climate-induced floods is the need of the hour. SEI is a great forum, which can develop the manual. As I said, the proposed manual would be useful worldwide. Flooding occured in many other countries. Please request Andrew Larsen and colleagues to include this in their work plans. And, yes, I agree with you - the proposed manual should not limit to floods, but should also include other aspects of disaster (earthquake, drought conditions, storms, etc).

Regards,

F H Mughal

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by Andrew - 13 Feb 2013 09:37

Hello Mr. Mughal,

Thanks for your interest in our work. Yes, I want to continue working toward a sanitation solution which can work in a variety of difficult situations with a focus on disaster-affected areas. We are fortunate to be able to work in Haiti through a grant from the Bill & Melinda Gates Foundation--they have been very supportive of our ideas. A more directed focus on disaster recovery is one of my main goals with the design we are working on.

Certainly, Pakistan has seen at least two major disasters in the last few years. With our system, we are containing all excreta and then processing it through composting or a combination of urine-diversion and desiccation. The latter has not been done just yet but we are hoping to be able to work on that more. With very dry areas where there is insufficient carbon for composting, it would be especially useful. Since it is all contained, there is no contact with the outside environment.

I have some friends at COMSATS Abbottabad (Dr. Bahadar Nawab and his students), whom I have met through my professors at the Norwegian University of Life Sciences. My school has very good connections in Pakistan through, among others, Professor Ingrid Nyborg at Noragric. Perhaps you may know some of these people? I would be excited to bring what we are learning to Pakistan at some point. I am also in contact with Nazir Sabir in Rawalpindi through email. He and I met at an alpine sanitation conference in the U.S. in 2010. He has expressed specific interest in environmental problems associated with sanitation on the Baltoro Glacier.

Please tell me more about what your work is involved with. Thanks for the post!

Andrew

Thanks also to Nelson and SEI for all the work they do!

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by F H Mughal - 13 Feb 2013 11:55

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Dear Dr. Andrew,

Seems like you have got a good number of friends in Pakistan, and you seems to know Pakistan quite well!!

I'm glad to learn about your work and, your intentions to work for the development of the proposed manual. I'm based in Karachi, a city in Sindh province of Pakistan. I'm a Senior Water and Sanitation Engineer. I earned my M. Eng. from AIT, Bangkok, in 1975. I'm concerned about the poor sanitation in Sindh; and now the climate change-induced disasters have added a new dimension.

Since, you have met Pakistani friends at seminars and workshops, perhaps, it would be helpful if SEI holds a workshop at its headquarter office, where we can come and learn from experiences of other participants, on the resilience in water and sanitation sectors in wake of the climate change.

Meanwhile, I'll be looking forward to your work on the development of manuals and resources. Good luck!!

Best regards,

F H Mughal

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by Ekane - 13 Feb 2013 21:02

Dear Mr. Mughal,

Regarding sustainable sanitation meetings in Stockholm, SEI usually hosts the Sustainable Sanitation Alliance (SuSanA) meeting in conjunction with the World Water Week (WWW) in Stockholm: www.worldwaterweek.org/

SEI hosted one of the largest ecological sanitation programmes (EcoSanRes Programme): www.ecosanres.org/index.htm

This programme ran for 10 years. Part of the objective of the programme was to establish sustainable sanitation knowledge nodes around the world. I include our knowledge nodes in the Asian region and their contact details below:

Environment and Public Health Organization (ENPHO)

110/25 Adarsa Marg-1, Thapagaon

New Baneshwor

G.P.O. Box No.: 4102

Kathmandu (East)

Nepal

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

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

www.enpho.org

www.nepal.watsan.net/page/627

James Gao (CWA)

Clean Water Alliance

F1702, Trumph City

No.170 Beiyuan Road, Beijing 100101

China

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

(James Gao)

www.cleanwater.org.cn/page/defaulten.asp?pageID=142

Zhifu Li (University of Science and Technology Beijing)

University of Science and Technology

Xuyean Road 30, Haidian District, Beijing 100083

China

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

(Zhifu Li)

ces.ustb.edu.cn/teacher/253.html

www.susanchina.cn

Center for Advanced Philippine Studies, CAPS

120 A K-8th Street, East Kamias Quezon City 1102

Philippines

www.ecosan.ph

www.caps.ph

Read more on the activities and publications of these nodes: www.ecosanres.org/nodes.htm

Best regards,

Nelson Ekane

Stockholm Environment Institute (SEI)

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by agi81 - 14 Feb 2013 11:29

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Dear all,

my name name is Agazi Medhanie and I am working as an intern for SuSanA since almost one month.

I followed attentive this very interesting discussion. In this context I read a very good study from Chars Livelihoods Programme to assess the performance of low cost latrines and access to clean water during the July 2012 flood in Bangladesh.

Specific questions relating to latrine use revealed that 77% of recipients reported using their own latrine during the flood, and 20% using another household's latrine.The low-cost latrine model proved successful as the majority of recipients continued to have access to sanitation during this time of flood.

This study shows that you **can** have good results with **low cost latrines** even in **flood** regions. Hope my post could enrich this debate.

The complete study is attached below.

Kind regards,

SuSanA secretariat.

[posted by Agazi Medhanie]

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by Andrew - 15 Feb 2013 06:19

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Thank you Agazi for the post. I will look through the Chars report. I think it is interesting that the usage

of the latrines was high when the population had them for individual families. It's always difficult to get the cost down low enough for each family to have one, but in aid situations it can certainly be argued that not getting latrines in during disasters can result in much greater expense during recovery, not to mention unnecessary suffering by those served.

Andrew

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by Ekane - 20 Mar 2013 13:36

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Dear Andrew,

Just breaking the silence and redirecting our discussion back to Haiti.

It is good that community leaders in Haiti were involved in the awareness campaigns you had and that the families using the toilets have taken the responsibility of maintaining the toilets. This is an indication of ownership which is key for sustainability of these toilet blocks. I am, therefore, interested in knowing the arrangement(s) these families have put in place for cleaning the toilet blocks i.e. what contributions are made for cleaning in cash and/or kind? who does what in cleaning and how often do they clean? Also inform about the arrangement and remuneration of the team of 4 people responsible for other operation and maintenance (O&M) activities beyond cleaning.

It is good that local materials are used and that the blocks are inexpensive to construct. What is the cost of the construction materials for a toilet block i.e. local lumber, nails, etc. Are the billboards obtained for free? How much was the labour cost for construction (in cash and kind)?

Finally, what were the direct support costs of the awareness campaigns and how long were these campaigns?

Best regards,

Nelson

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Re: Urban sanitation solutions for high-use, flooded, and difficult to serve areas in Haiti

Posted by gitum - 12 May 2013 22:44

Dear Andrew,

It's a very interesting project. I also pursue my PhD on WASH issues in Onaville in Canaan area, Haiti which increase my interest on your project. If you don't mind, I also would like to ask you couple of questions regarding to your work.

How often do you collect excreta from the collection bin below the toilet for transferring it to a composting site (every 6 months or so)? How far and how big is the composting site? How do you manage the composting facility?

I am also curious on your community involvement work. Currently, we work in collaboration with a local NGO, TECHO. TECHO informed us that there is lack of local sanitation expert in the area to start the community education on WASH. How did you solve this issue? Did you work with SOIL or another Organization? Also, how long did the community awareness education take?

Moreover, in my previous research I come up with the problem of helminths in Haiti. I saw from your presentation at FSM-2 Conference that 60°C, 1 week hemophilic composting process will be enough for pathogen removal. Still, I am curious if you have any information on helminths.

Best,

Gökce

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Low-cost sanitation for emergencies - Aerosan in New Delhi

Posted by Andrew - 24 Apr 2014 08:54

Here are some links to our Aerosan booth (Low-Cost Sanitation for Emergencies) in New Delhi, at the Reinvent the Toilet Fair sponsored by the Bill & Melinda Gates Foundation in March of this year. It was a really good gathering of people working in sanitation. We made some good connections there will be working more closely on emergency designs and deployment going forward.

Cheers,

Andrew, Hana, Dave, Attilus

My interview about project story (questions asked by Elisabeth):

In this video you can see me giving a guided tour of our exhibit (it was a hot day with little shade!!):

Short description copied from Technical Guides (susana.org/lang-en/library?view=ccbktype...p;type=2&id=2001), page 5:

Aerosan: Low-Cost Sanitation

for Emergencies

Aerosan has developed a four-toilet array as well as a separate single-unit cubicle. Key to the design is the use of enhanced passive ventilation for both control of odors and also drying of excreta. The material can be subsequently composted. The low-cost construction approach using re-purposed vinyl billboard fabric allows for a large plenum (a space provided for air circulation and venting), which, driven by a Venturi is able to move more air through the system than would normally be available in a typical 4” (100 mm) vent pipe. The design

puts the outlet of the plenum 15’ (4.3 m) above the ground, so odors are released at a higher elevation than typical vented toilet cubicles.

Several units have been deployed for field testing in Haiti and are operating at a high level.

The unit shown at the Delhi toilet fair is fully functional and will be an improved design from the one shown at the first toilet fair in Seattle in 2012. Design improvements have focused on reducing the weight, cost, and improving the wall and plenum structures. Also, the whole design will be available in kit form for use in emergencies.

How it works

The primary technical feature of this toilet is the design of a passive ventilation system which draws more air than is necessary for simple odor control. In this way, a degree of drying takes place which reduces volume accumulation of excreta and thus increases the number of users that can use the system per maintenance period. Ventilation is both wind and solar-driven, but all passive.

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