

Conference report

Design a Bog Day

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Humanitarian field staff, product designers and manufacturers attended a one-day event to tackle sanitation challenges in humanitarian situations. The challenges included designing a household handwashing device, a latrine superstructure, a trench lining for latrines in difficult soils, and a raised latrine for rocky ground and areas of high water tables. Design criteria included: a manufactured commodity, lightweight and robust, packable and portable, and low cost. A number of innovative designs were discussed which will now be developed into prototypes for testing in the field.

Keywords: sanitation, humanitarian situations, product design, latrines

SILENT THUNDER WAS HEARD throughout Oxfam House in September as Design a Bog Day brought together some great and imaginative minds to brainstorm and develop designs for new emergency sanitation kits.

Sanitation was recently formally recognized as being one of the biggest gaps in humanitarian WASH provision by the Global WASH Gap Analysis (Bastable and Russell, 2013), but it has been known in the sector for some time. The 2nd Stoutenberg Conference of 2011 identified that key areas for improvement were raised latrines, desludging and faecal sludge treatment. These were the themes of the 2012 Delft workshop on emergency sanitation (Sustainable Sanitation Alliance, 2012), where specifications were developed. These and other efforts resulted in the Emergency Sanitation Project, a collaboration between IFRC, WASTE and Oxfam GB, funded by OFDA, developing new solutions for emergency sanitation in the areas of: desludging, disposable bags, treatment, handwashing, no-latrine options, urinals, latrine linings, raised latrines, latrine superstructures, and slab designs. It is as part of this that Design a Bog Day was conceived, with a specific mandate to focus on four hardware-related areas:

1. *Handwashing device.* A household-level, hygienic, water-saving device to encourage handwashing at more of the critical times, either integral to a water container or adaptable to fit many.
2. *Latrine superstructure.* Something flat-pack or foldable that can give users shelter, privacy, comfort, dignity, and security when going to the toilet.
3. *Trench lining.* Products that can allow the digging of pits in difficult soils. Potentially two products: one for crumbly soils that does not need to be deep or structural, and one for the infamous black cotton soil and similar where a full structural lining is required.

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4. *Raised latrine.* A solution for when it is not possible to dig into the ground because of high water tables, rocky ground, government restrictions or collapsing soil. At least 1m³ faecal containment per latrine is required, although the use of smaller interchangeable containers may be possible.

Attendees from beyond the field of sanitation were sought, with adverts put out in relevant press to search for product designers and potential manufacturers. The result was a mix of field practitioners from INGOs, academics, product designers and representatives from suppliers and manufacturers. This brought together people who would approach things differently and meant networks could be built between people who might not normally meet.

In advance of the day attendees were introduced to some of the design tensions associated with developing kit for humanitarian relief, namely:

- As a *manufactured commodity* it must be ready to go and one size fits all, but the kit provides a *human experience* for all sorts of people – young, old, sick, healthy, women, men – all who need dignity and protection.
- The kit needs to be *lightweight* so that it can be flown in at reasonable cost, but it must also be *robust* to withstand rough handling on route and then use hundreds of times a day in some of the toughest climates in the world.
- Emergencies are often in hard-to-reach places so it must be *packable and portable*, but it must also be easy to put up in a hurry, in less than ideal conditions, when fieldworkers have got a hundred other things to do.
- There's a budget even in an emergency setting, and donors can be hard people to convince, so it needs to be *low cost*, but it also needs to be *high value*: providing people with invaluable health protection, dignity, security and safety.



Figure 1 One of the more outlandish ideas: a latrine for rapid poo drying

Participants brought objects that solved some of these tensions and could provide inspiration for a new sanitation kit. Objects ranged from a pair of tights, which is a manufactured commodity that provides a comfortable human experience, and is lightweight and strong; to a rubbish chute (the type used for dropping things from scaffolding to skips), which is stackable and transportable, lightweight and robust; to a cardboard tube, which is multi-purpose and low cost, yet light and strong.

The most promising sparks of ideas were fanned into embers by considering how the products must perform at each stage in their life: in use, for maintenance and installation, in selection by the project team, being transported, being manufactured, and right back to the design stage.

These ideas included a dual pipe mechanism which, when pushed up, would dispense a fixed amount of water; a handwashing device inspired by a budgie bottle, which would feed out water without any mechanism; a 'pram potty' folding latrine superstructure inspired by a lampshade (see Figure 2) that would fold up; a 'second-life latrine' that after initial construction is sprayed with concrete; an inflatable temporary formwork for latrine linings; an impregnated flexible lining roll for latrine trenches; a raised latrine made from a wheelie bin; an inflatable slab which was inspired by an inflatable windsurfer; and a hexagonal raised latrine which could use less material than an equivalent rectangular design.

While all these ideas and various other small things that came up can inspire further brainstorming, there are a few ideas that after voting were particularly popular:

- A wrist- or foot-operated *pump atomizer*, which releases a controlled spray of water from an existing container by pulling a large loop. It's hands-free, water saving and can be used by disabled people.
- A *spray lining* using a foam or maybe spraycrete that can be sprayed onto a chicken wire mesh. Challenges here involve identifying a suitable spray material that is suitable for air freight.
- A *snake-like latrine lining* consisting of a very long bag, or bags, which are filled with a material that hardens on contact with water, possibly mixed with soil (see Figure 3). Questions remain regarding its strength, and what could that material in the middle be?
- A *raised latrine block*, inspired by Flexsolutions' raised latrine design, that will have a very large containment volume underneath, making it easier to empty.

To make these embers burst into flame I will be working with designers and manufacturers to refine the ideas and make them into workable prototypes, which will be put out for discussion to all interested parties. I will be looking out for opportunities to test these prototypes in the unpredictable world of humanitarian response.

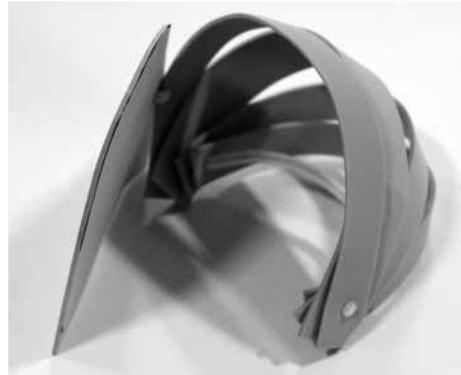


Figure 2 A model of the 'pram potty' pop-up superstructure



Figure 3 A hollow snake-like lining. Can we make this work in practice?

One of the inevitable questions asked during the day is how much this sanitation equipment will have to cost. Other than the stock answer of 'cheap', I am researching how much it costs to implement sanitation in different emergency situations, and hope this will provide a good ballpark figure. While working on bringing down the cost of high-quality sanitation equipment is necessary, there is an equal need to raise expectations about the quality of sanitation infrastructure that should be provided in the early phases of emergencies. It is not acceptable to expect people to use poor-quality sanitation facilities in emergencies. I hope that in time it will be standard practice to see high-quality sanitation and handwashing kit being purchased alongside the water equipment and self-supporting plastic slabs that are now ubiquitous in emergency responses.

More photos from the day and the specifications for the emergency kit we were trying to develop at Design a Bog Day, as well as information regarding the Emergency Sanitation Project more generally, is available at: www.emergencysanitationproject.org

References

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