Rethinking the unthinkable — effective excreta disposal in emergency situations

by Jim Howard

Thoughts about the needs of people living in refugee camps usually focus on food, water, and medical care. Who wants to dwell on the unpleasant (if necessary) removal of vast amounts of human waste? Technical solutions can be found if fresh, creative thinking is applied to sanitation engineering.

THINKING ON SANITATION in emergencies — compared with other interventions such as water supply and medicine — is surrounded by a lot of confusion, reflected in the lack of prepared equipment and packages.

The fundamental problem is that, whilst supplying water and food involves bringing in welcome inputs to the needy population, sanitation (particularly excreta disposal) concerns taking away a daily production of unwelcome and unpleasant human excreta. Talking about the subject is difficult, even for professionals in the field (witness the number of euphemisms commonly used for human shit), and agencies usually try to deal with it on the cheap.[1]

Many current attitudes display a tendency to excuse bad engineering by over-stressing the software side of sanitation, which is only of use when supporting a well-prepared, physical engineering input.

The answer lies in having well-thought-out and tested sanitation equipment, to provide facilities which are welcomed by people in emergencies. This is not available today. Because sanitation needs are very specific to terrain, climate, culture, duration of the situation etc., there has to be a wide range of technical options available.

Desperate measures ...

• *Sewage storage, India 1971.* When civil war erupted in East Pakistan in 1971, around 10 million refugees fled over the border into India. Torrential monsoon rains turned the 100 or so camp sites into quagmires of water and sewage, with serious outbreaks of dysentery and cholera. Oxfam's emergency solution was to build sewage-containment ponds, ringed by plastic latrine plates, with pipes discharging into the pond. Well-used, the units' operating time was limited before desludging became necessary; fly larvae were a severe problem.

• *Oxfam sanitation unit, Bangladesh, 1972-80.*

As a direct result of this India experience, Oxfam manufactured over 100 sanitation units in what had become Bangladesh, based on enclosed storage and treatment, using two 18 000-litre

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Rwandan refugees cross the Rusizi bridge into Zaire at Bukavu, August 1994.

Chris Bain/Oxfam

Women build an Oxfam tank in the Goma camp of Mugunga, August 1994.

pillow tanks (made of flexible plastic, also known as bladder tanks), and 20 latrine plates. The University of Surrey carried out detailed field studies of their effectiveness in sewage treatment, the elimination of cholera, and the control of parasites. Although initially designed for 1000 people, on any one day each unit was used by up to 3000.[2]

- *Sea-water flush sewerage system, Pulau Bidong, Malaysia 1978-9.*

This small, uninhabited volcanic island in the South China Sea was 'home' for up to 50 000 Vietnamese refugee boat-people. All requirements had to be shipped the 12 miles from the mainland, including all water supplies. Very quickly the small beaches and the surrounding sea were thick with human excreta and, as the situation became intolerable, the people placed their excreta into the plastic food-bags and cast them offshore to drift with the current. The authorities became alarmed when thousands of noxious 'balloons' floated into high-class tourist resorts.

Oxfam installed a 50 000-litre water-storage tank, on a high point of the island; sea water was pumped from the beach to the tank, and then used to flush a 200mm plastic sewer pipe which crossed the main living area of the camp. A number of latrine blocks — each containing 20 latrine plates — were constructed along, and connected to, the sewer pipe. The sewer followed a gradient steep enough to prevent excreta from sticking to the sides, and discharged through a submerged outlet well clear of the island. The gravity system dealt well with the sewage of up to 50 000 people.

Varying numbers of refugees continued to live on Pulau Bidong for several years, and the system was modified: the tanks were sectional steel plates (Braithwaite pattern), the main sewer pipe was a 200mm push-fit type, and both plastic and wooden latrine plates were used. The sea-water supply also came in useful to fight fires; a serious risk in what were the densest of living conditions, with people living in flimsy, two- and three-storey bamboo structures.

For the future

Lessons learned from these experiences include:

- each situation is different, but several technical options are available;
- people like, and will use, safe, clean, private latrine facilities;
- the user need not be aware of, or involved in, the type of treatment or disposal system being used, but is very aware of her or his point of contact. The facilities must be user-friendly for men, women, and children;
- it is important to ascertain and provide for the anal-cleansing habits used by that population. What can be provided — water, soap, paper?
- more thought should be given to using mechanical means to prepare defecation areas and trench latrines: trenches can be cut deeper, with more controlled width, suitable for bridging with lightweight, movable latrine structures.
- Oxfam-type water tanks — bolted, corrugated-steel tanks — either lined or unlined, could be used for sewage containment or even treatment, particularly where there are natural gradients;
- more thought should be given to transporting sewage off sites. Agencies often get involved with transporting water; the volumes of sewage would normally be much smaller, and carried over far shorter distances than water. Pumping of sewage, particularly if macerated (ground up), could also overcome problems on certain sites; the site collection of sewage — via plastic buckets with lids supplied to each family — is not beyond the realms of possibility, and is already used extensively in different parts of the world.

As a part of good camp management, the maximum possible amount of human excreta and refuse should be removed and disposed of outside the camp area. These are a few thoughts; fresh and more creative thinking on engineering preparedness is urgently needed from every agency.

Notes

1. For the historical perspective, see 'People are at the heart of sanitation', de Jong, D., *Waterlines*, Vol. 14, No. 3.
2. Details of the Oxfam sanitation unit, and biological studies, are available from Oxfam.

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