sustainable sanitation alliance

SuSanA factsheet

Sustainable sanitation for emergencies and reconstruction situations

April 2012

1 Summary

This factsheet addresses current developments, challenges, gaps and solutions in the planning and implementation of sustainable sanitation for emergencies and reconstruction situations focusing on low and middle income countries. It is mainly intended for students, researchers, policy makers and practitioners.

Shortcomings of current approaches for emergency prevention and relief include: Insufficient resources invested in sanitation, lack of prioritisation of sustainable solutions, inadequate human resource capacity for urban sanitation in humanitarian agencies and lack of good governance for reducing disaster risks. The last issue particularly impacts the risk reduction potential of countries. To reduce the risk and potential effects of disasters, sanitation solutions need to be robust to buffer against certain challenging environments. In emergency situations, groups with specific needs need to be considered (i.e. children, women, elderly, injured and people with disabilities) and appropriate emergency relief measures for each stage of an emergency situation need to be selected.

We recommend the following to the actors in the emergency and reconstruction sectors:

- Increase funding for sanitation in emergency and reconstruction situations with regards to software as well as hardware components.
- When implementing immediate sanitation solutions, apply those which can be adapted in later phases to become more permanent and sustainable.
- Use adequate sanitation options which are robust and can cope with challenging environments.
- Build capacity in local entrepreneurship for long-term self-help in the reconstruction phase.
- In between emergencies incorporate risk reducing measures in local and urban planning which will prevent and reduce the need for response efforts.
- Engage in learning activities and experiment together with other professionals to increase innovation of options.

2 Introduction

The United Nation's International Year of Sanitation 2008 highlighted the need for improved access to sanitation systems in general. In addition, many disaster situations demonstrate the need to address sustainable sanitation solutions in particular. Sustainable sanitation systems take into consideration aspects of health, environmental resources, economic viability and socio-cultural acceptance as well as technical and institutional appropriateness (SuSanA, 2008).

Sustainable sanitation systems in emergencies also require examining the resilience and robustness of existing systems to function during the entire emergency. For example, disaster situations often present additional challenges of difficult environments, such as flooding, lack of transport and access of materials. There are also challenges of a traumatised and injured population and disruption of societal functions exposing vulnerable people to even more health risks.

Figure 1: Raised toilets in Haiti provided by IFRC for 275,000 people per day with materials produced in Dominican Republic and constructed in Haiti (source: IFRC, 2010).

Sustainable solutions also have to manage the transition into a post-disaster phase and future development, and assure that immediate measures do not create unwanted health hazards or other undesirable consequences in the longer term. Many humanitarian actors (mostly NGOs, UN, unilateral aid, etc.) acknowledge that current sanitation practices are often not sufficient.

There is a need for innovation through interaction with experts who are not normally involved in emergency responses, such as private manufacturers, urban sanitation engineers, and industrial designers. This exchange and learning is not that easy as the various actors involved in disaster response usually have little time for networking, research and updating their expertise on other systems. The SuSanA Working Group 8 is aiming to act as an open platform to bring people together with the purpose of pushing

towards more sustainable solutions and information exchange.

3 Shortcomings of current approaches

a) Insufficient resources invested in sanitation

Emergencies pose huge challenges for containing large volumes of excreta of the affected or displaced population. Interventions need to be carried out as quickly as possible in places submerged by flood water or in ruins after an earthquake or due to other disasters. The great focus on water supply in emergencies has made sanitation a forgotten area, often resulting in a sanitary disaster threatening the very health objectives which clean water supply aims to address. Agencies and donors are generally more willing to fund expensive water treatment units (which are often high-tech and can easily be shipped in one container) than to make the expenditure for sanitation systems – which are also less attractive in terms of media coverage (Andy Bastable, Oxfam GB, personal communication, 2011).

Figure 2: Unusable pit latrine during a flood in Bangladesh (source: S. Uddin, 2007)[1].

The result is that toilet pits or containers fill up quickly and become sanitary hazards. For existing sanitary facilities, there is often a lack of consultation with users at the design stage, leading to facilities that are not used as intended. Insufficient resources provided for maintaining and cleaning public facilities lead to unused toilets. Finally, inadequate supervision of self-build sanitation programmes can cause incorrect positioning and construction (Groupe URD, 2010).

b) Lack of prioritisation of sustainable solutions

Due to the focus on speed and quantity, sustainable solutions are often not prioritised. This is related to the phased approach of sanitation interventions in an emergency. In the height of an emergency, options are applied as short term measures (e.g. trench latrines[2]). These options are later replaced in a phased manner by more permanent options such as pit latrines, septic tanks, urine diversion toilets etc.

Challenges commonly faced are high water tables, unstable sandy soils and crowded urban areas, which require creative ideas in the height of the emergency and in the long term for a sustainable solution. If these challenges are not addressed the result can be overflowing, leaking, malfunctioning, or unused toilets, even for solutions designed for that particular emergency phase. When humanitarian agencies leave, there is a lack of sustainable alternatives for the long term, which is a challenge in the prolonged emergency.

c) Inadequate human resource capacity in humanitarian agencies for urban sanitation

There is an increasing number of urban disasters. At the same time humanitarian agencies have inadequate human resource capacity to implement urban sanitation solutions. Such sanitation systems would have to be integrated in the existing urban systems which were often not working well even before the emergency and which are complicated to fix (Heeger, 2011). The most common solution currently used, the pit latrine, is not a viable solution for crowded urban conditions, where it may contaminate the groundwater and thus the water supply. Pit latrines remain however a better solution than a total lack of sanitation solutions i.e. open defecation. The recent response after the earthquake in Haiti in 2010 has led to innovative thinking by many WASH practitioners working in the urban environment of Port au Prince for the first time (see Box 1 and 4).

d) Lack of good governance for reducing disaster risk

In 2010, the earthquakes of nearly the same magnitude in Haiti and Chile disclosed the importance of better building codes, resulting in only 200 lives lost in Chile compared to 200,000 in Haiti. In addition, Haiti had inadequate water and sanitation systems before the earthquake, making the system vulnerable to disasters. For example, it was difficult to agree on a designated area for waste disposal and this led to dumping solid and faecal sludge in the same uncontrolled ways as before the earthquake (see figure 3).

Bad governance, poverty and corruption make a population very vulnerable to disaster. Also, urban development in coastal areas is increasing and consequently there is also a growing exposure of the inhabitants to coastal hazards on a regular basis. Due to lack of planning and infrastructure (e.g. drainage), peri-urban low income areas are turned into sanitary health hazards especially in the rainy season. Vulnerable people with low coping capacity living in these areas might easily get locked in poverty cycles. Peri-urban areas present furthermore a risk as authorities often do not assume formal responsibility and they are effectively left ungoverned (Andrew Parker, UNICEF, personal communication).

[1] For further information see: www.susana.org/lang-en/library?view=ccbktypeitem&type=2&id=1206

[2] The term “toilet” is used for the general function of a user interface and for toilets which are above ground. “Latrine” is used for types of toilets which require a hole in the ground, e.g. a pit latrine.

Figure 3: Dumping of sewage or faecal sludge from a UN camp into a lake in the surroundings of Port au Prince in Haiti in 2010 (source: L. Pierre, "Organizing for Haiti", 2010).

4 Resilient and robust sanitation systems

Natural hazards such as extreme rainfall (leading to floods) and earthquakes do not necessarily result in disasters. They only turn into disasters when human society is unprepared for them, where infrastructure and planning has not been designed to withstand or buffer against them and if society cannot respond or learn adequately. Human history, human action or inaction and exposure (e.g. geography) determines the level of robustness or resilience of a population to the impact of natural hazards.

Solutions need to be robust to buffer against certain challenging environments which include for example:

- Unstable soils (e.g. sandy soils) make the lining of pits necessary to prevent them from collapsing.
- High groundwater tables and flooding cause problems with the containment of the excreta. Potential solutions include sealed pits or above ground structures.
- Rocky soils make digging difficult and uneven geology (e.g. sand mixed with rocks) increases risks of groundwater pollution with pathogens and nitrate.
- Spatial constraints mainly in urban areas where the construction, replacement and maintenance of toilets, as well as pit emptying, is restricted due to a high population density.

Apart from buffer capacity or robustness of technologies, resilient systems also involve the adaptive (social) capacity to learn, adapt and self-organise (Folke, 2006). When disasters occur, informal social structures are important, and in most cases government bodies and local volunteers from organisations such as Red Cross/Red Crescent are early on site and mobilised quickly.

Box 1: Sanitation technology development in Haiti
After the earthquake in Haiti (2010), a very crowded environment combined with extremely difficult digging conditions made many agencies install a considerable number of raised and portable toilets. Haiti thus triggered more innovative thinking about sanitation solutions from all agencies e.g. biodegradable plastic bags, biogas systems, urine diversion and compost toilets. An indicator of the effort in sanitation by the agencies was the fact that the cholera outbreak in Port au Prince did not become an epidemic in the camps, while this was the case outside the camps (Johannessen, 2011).

Apart from robust technology or "hardware solutions", appropriate "software methods" that engage target groups, create demand for services and encourage the change of behaviours also need to be applied. This is often coordinated by the WASH cluster[3]. Good practice includes the introduction and support of health committees, training WASH (water, sanitation and hygiene) workers, appointing a focal point for cleaning, and paying people to do this with a certain rotation frequency. Further examples include:

- PHAST (Participatory Hygiene and Sanitation Transformation) triggers behaviour change in communities, and empowers them to plan and operate WASH systems, and is used during emergencies.
- Community Health Clubs have been used for cholera mitigation in Zimbabwe (2008-09) where health education and changes of hygiene practices prevented a cholera epidemic. It has also been applied in refugee camps in Uganda (Waterkeyn et al., 2009).
- During the flood in Pakistan in 2010, a great number of camps used CLTS (Community Led Total Sanitation) to encourage people to use toilets (Johannessen, 2011).
- An "EcoSan toilet beauty contest" by SCOPE after the Indian Ocean tsunami in 2004 was a popular form to involve communities during the reconstruction phase[4]. In fact, the lack of a severe disease outbreak after this tsunami is to a considerable part credited to extensive hand washing and hygiene campaigns.

Interventions in emergencies tend to be managed well when they are implemented by dedicated groups of staff working with small communities with whom they develop clear reciprocal relationships and understanding. Local NGOs already active in the area are often invaluable in mobilising and reaching local communities and building their trust.

Box 2: Adapting toilets to fit special needs
In 2011 ACF cooperated with the manufacturer Nag Magic to develop an improved plastic slab design. The new design makes it possible to transport more slabs at a time, to support people who have difficulties with squatting, to make it easier for wheelchair users to enter and turn, has bright colours which help visibly impaired people and has adaptations for children (Johannessen, 2011).

[3] More information on the WASH cluster (WASH stands for water, sanitation, hygiene): www.humanitarianreform.org
[4] SCOPE in Trichy, India: www.scopetrichy.com

5 Consideration to groups with specific needs

a) Specific needs of children

- Young children defecate either in the open or in a potty, which needs to be managed by their parents or carers. Cleaning and disposal of children's faeces needs to be done rapidly and hygienically, as the faeces can be highly infectious.
- Young children prefer bright toilets, without a roof and door (Harvey, 2007) or only a slab. They need to be near the women's toilet and require accessories such as: extra step, potty and low hand washing if integrated with adult toilets.
- Children's latrines can be painted with hygiene related messages specifically targeted at children thus creating awareness and ownership.
- When surrounded by chaos, schools can provide children with a sense of normality and personal safety, helping them to recover psychologically. Appropriate WASH measures in schools should be taken[5].

Figure 4: Child friendly toilet which is open and bright for use by young children in a post Tsunami camp in Sri Lanka in 2004 (source: J. Lapegue, ACF, 2004).

b) Specific needs of women

- Women should be consulted on the design and location of the toilet, to consider their preferences and reduce security risks, especially at night (Adams, 1999).
- In many cultures, toilets and relevant training needs to be separate for women, men and children.
- There is a need to provide menstrual pads and underwear in an emergency, bearing in mind the cultural context and appropriateness e.g. colour, shape, disposable versus recyclable. In the long term, refugees can produce their own pads out of local and recycled materials (Ann-Kathrin Scheuermann and Annelie Albers, GIZ, personal communication, 2011).
- Some agencies (e.g. Red Cross) provide "hygiene comfort kits" which include underwear that is important to accompany the menstruation items and extra cloth.

c) Specific needs of people with disabilities, elderly or injured people

As many as 1 out of 5 people can be disabled by birth or due to temporary illness and injuries in an emergency (Jones and Reed, 2005). People with disabilities need to be able to access the toilet and need support for sitting. There is also a need for space for a wheelchair user to enter the toilet cubicle and turn around.

Box 3: Key socio-cultural considerations

- User consultation is crucial also in the immediate phase.
- Accountability of the operation and maintenance can be supported by limiting access (e.g. using a padlock).
- Information, training and sensitising can achieve significant reductions of diarrhoeal diseases.
- Cultural considerations, e.g. people who practice anal cleansing with water need access to water. Toilet seats and urinals oriented towards Mecca might be rejected in Muslim cultures.

6 Solutions for the immediate to short-term stages of an emergency

Top priority in immediate emergencies is containing excreta as fast as possible. Defecation fields are frequently mentioned in the literature but are not often implemented. Often the implemented minimum standard is a simple pit latrine structure. In addition, it is necessary to equip each toilet or block of toilets with a hand washing facility with soap. Desludging and safe disposal of the collected excreta is crucial for the mitigation of health risks but is often very challenging.

Humanitarian agencies usually install so called rapid latrines. These latrines are ready-made solutions and normally part of the agency's contingency stocks in the region or are ready at the headquarters' warehouses to be shipped at the height of a crisis. At the initial stage, there is also a need to plan intermediate steps, such as communal toilets, setting up a slab manufacturing facility and collecting local materials for superstructures.

Humanitarian agencies have realised that the more permanent these initial structures are, the better. They also recognise that the first 1-2 weeks are the most critical as this is the time when there is a big gap in suitable technologies even without considering aspects of sustainability.

In 2011, WASTE and Oxfam GB organised a workshop in Stoutenburg, the Netherlands, involving sanitation specialists from different humanitarian agencies and the development sector to discuss how to improve gaps in technologies for the immediate phase and to understand more of the product design process. Three technology gaps were identified: 1) raised toilets; 2) improved desludging options; and 3) sludge disposal and treatment kits. These

[5] www.unicef.org/wash/schools/files/WASH_in__Schools_in_Emergencies_Guidebook_for_teachers_.pdf

three gaps were selected acknowledging that much work had already been done on slabs and on biodegradable bags. Each of these would need design specifications to fulfil the requirements of an emergency (lightweight, pallet size, flat packed etc.) (Johannessen, 2011). In the following some of these more sustainable immediate solutions are described.

Box 4: Oxfam's new sanitation approaches in Haiti

Oxfam's response in Haiti included pit latrines, septic tanks, portable toilets ("port-a-loos"), urine diversion, and biodegradable toilet bags. The latter two approaches are described below:

1) **Urine diversion dehydration toilets (UDDTs)** were funded and installed in cooperation with the local partner SOIL. This involved the installation of 200 urine diversion toilets in 31 camps in PAP in the months immediately following the earthquake. Urine was diverted either to a soak-away or was stored for agricultural use. After each excreta deposit, users added a small amount of chopped sugarcane. The mix was contained in a plastic drum, which was removed weekly by the local partner SOIL, who composted it. The aim of the urine diversion was to reduce the volume of faecal sludge and to produce a demand for the urine and compost. Users indicated that they preferred this to pit latrines or raised toilets as the UDDTs were considerably less smelly (http://oursoil.org/what-we-do/ecosan/).

2) **Peepoo toilets or simple biodegradable bags** were used directly inside of cubicles or by placing them inside of small containers for home use. Male and female urinals were also part of this approach. People used the urinals and defecated into a bag, tied a knot in the bag and deposited it in a covered plastic drum, emptied daily. The contents were taken to a local composting site. This approach has also received very good feedback. It is a good solution when desludging trucks are unable to access the congested camps, or for use at night.

Source: Cocking and Bastable (2010) and Patel (2011)

a) Biodegradable plastic bags

Biodegradable bags can be inserted into a locally available small container to create individual toilets or to be used as part of a communal facility. During emergencies, biodegradable bags could help address the time needed to construct adequate latrines or where traditional options cannot be utilised, or if there are gaps in coverage (for household-level use especially by people with disabilities, children and women at night). Proper burial or collection for a composting system must be ensured to make it a hygienically safe system. Further research is needed regarding the cost effectiveness over time and phase-out points or upgrading strategies.

Figure 5: How to use the Peepoo (source: www.peepoople.com)

The "Peepoo toilet" is one such model on the market. Pathogens in the faeces which are collected in the bags are killed due to ammonia gas which develops when the urea granules supplied inside of the bags get wet. This technology can include a reuse aspect, and the fertiliser value of the bag's content could create an income for collectors.

b) Emergency urine diversion toilet slab

The prefabricated plastic toilet slab for immediate dispatch is central in an emergency, as other toilet parts are often locally available. Some humanitarian agencies have taken measures to diversify the standard squatting slab by adding a urine diversion part to separate urine and faeces.

The urine diversion slab allows for immediate separation of urine. By reducing the liquid content the time that the toilet can be used for – before the container or pit fills up – is prolonged. Separating urine also accelerates the drying process of faecal matter and reduces odour and flies. The urine, which contains the most nutrients of human excreta, can either be drained into a soak pit or collected and reused. However, the reuse of urine and faeces is an "add on" and can only be applied at a later stage (in the recovery phase). Urine does not necessarily have to be reused if the only aim of the separation is to reduce volume of faecal waste, and reduce odour and flies.

Challenges may however be:

- User acceptance and willingness or behaviour change to use the toilets correctly, such as ensuring that anal wash water is discharged separately from the faeces.
- Urine pipe blockages.
- The urine diversion pan may be more difficult to clean compared to a normal pit latrine slab.
- Finding suitable local or regional suppliers in the longer term.

c) Raised toilets with or without urine diversion

The raised toilet is appropriate when it is physically not possible to dig into the soil (hard surfaces) or land ownership prohibits digging. In Haiti, for example, IFRC could not use their rapid toilets in many places. Disadvantages of raised toilets include relatively slow and costly installation and the need for more frequent desludging than toilet options dug into the ground where all liquids are allowed to infiltrate (Johannessen, 2011). The speed and cost issues are currently being optimised.

Figure 6: Left: Plastic urine diversion slab prototype by Indian manufacturer Nag Magic, is not yet available on the market (source: Oxfam GB, 2011). Right: Raised toilets in Bangladesh are still functional during flood events (source: S. Uddin, 2007).

Table 1: Simplified overview of different priorities and technology choices depending on the phase of emergency.

	Immediate (<one month)	Short term (one to six months)	Medium term and recovery (six months to one year)	Long-term (>one year)
Priorities	Fast containment of excreta (and hand washing)	Promoting use, organising people for O&M of toilets, hand washing	Longer term use and sharing	Improvement of sanitation where people demand it
Solutions	Collective solutions	Collective and household solutions	Household solutions & institutions (schools etc.)	Household solutions & institutions
Technology choice (current practices)	Defecation fields, shallow trench, deep trench, biodegradable bags, raised toilets, urine diverting dry toilets (UDDTs)	Communally managed toilets, family toilets	Pit latrine, VIP latrine, UDDT, Fossa alterna, Arborloo, pour-flush toilets, septic tanks, decentralised wastewater treatment systems	Previous technologies and individual simple pit latrines may be an option in low-density, longer-term emergency settlements.
Socio economic factors	- Consultation - Special needs groups - Information -hygiene training, sensitising	Previous factors and: - Monitoring (full toilets or pits) - Logistics and handling - Accountability	Previous factors and: - Financial resources and willingness to pay - Local champions	All previous factors

d) Waterless urinals

Urinals are useful for keeping liquids out of the toilet pit, thus extending the period it takes to fill the pit. Where appropriate, the urine can be reused as fertiliser for crops following existing urine reuse guidelines

e) Trench latrines and other wet toilet systems

Often excreta are buried in deep trench latrines. If water is available, wet systems such as pour flush pit latrines, may be selected. In any case, the most important aspect from a sustainability point of view is to design and place the latrines in a way to avoid groundwater contamination. Pit latrines and soak-aways for percolation into the ground should be at a suitable distance from any groundwater source, and the bottom of any latrine should be high enough above the water table (for details see Nick et al., 2012). Drainage or spillage from latrines must not run towards any surface water source or shallow groundwater source. Ideally, environmental health staff should be involved in ensuring that adequate sites are chosen and laid out to provide suitable conditions for sanitation.

Figure 7: Emergency pit lining kits to avoid collapse. A man hole provides access for desludging. Left: modular corrugated plastic. Right: new design with internal props (instead of relying on locally available wooden props included in former design (source: J. Rhode, Evenproducts, 2011).

f) Desludging and disposal

Desludging is necessary when the containers or pits of toilets are full, and is often done by a fleet of vacuum trucks. There are also manual desludging pumps. Commonly faced problems are stones, corn husks, and other materials used for anal cleansing as well as garbage that is disposed of in the toilet's pit or container which make it difficult to pump out the faecal sludge. A big gap in emergencies is the safe disposal and management of the faecal sludge once emptied from the toilet facilities.

Box 5: Rapid latrines by IFRC

The immediate emergency requires sanitation solutions suitable for fast response. The IFRC "rapid latrine", has a prefabricated superstructure that can be shipped and easily erected. It has been developed in cooperation with UNICEF, Oxfam, and equipment suppliers. The technology is included in the Mass Sanitation Module 20 (MSM20) which provides hygiene promotion and sanitation for 20,000 people. The MSM20 includes 100 rapid latrines, and 100 squatting plates, with additional rapid latrines available if needed. The squatting plates have a pour flush option. The rapid latrine is built to cater for the first 1-4 weeks, when local procurement of materials is difficult. However, there are examples, where rapid latrines have become a permanent solution as during the emergency response to the Sichuan earthquake in 2008. Design principles for the rapid latrine are:

1. Easy to assemble, clean and transport
2. Rapid construction (20-25 superstructures per day)
3. Light weight
4. Durable for 3-6 months and stable
5. Cheap

Source: Libertad Gonzalez and William Carter (IFRC), see in Johannessen (2011)

7 Solutions for the medium (recovery) to long-term stages of an emergency

In the medium (6-12 months) to long-term (>1 year) stage of an emergency the situation is stabilised and emergency toilets can be turned into more permanent structures. Ideally, the immediate solutions should be suitable to be adapted. For details on sanitation technologies in the medium to long-term stages see Harvey (2007). Some

examples of sanitation systems used in the past during the recovery or long-term stages include:

- Larger communal glass fibre systems which are affordable and light weight such as the DEWATS systems of BORDA in Indonesia.[6]
- Biogas sanitation is an option investigated by IFRC (2010) for Haiti during the reconstruction phase. These systems produce biogas which can be used for cooking thus saving fire wood (addition of animal excreta or organic waste is recommended to obtain a reasonable amount of biogas). The design must be resilient to local disaster risks.
- Fossa Alterna with two alternating pits; this technology was successfully introduced in camps in Harare (Morgan, 2007).
- Raised UDDTs have been built such as in Bangladesh by Terre des Hommes to withstand flood events (Delepière, 2011).

8 Rehabilitation and disaster risk reduction

Re-building better after a disaster reduces risks from recurring hazards such as floods. Rehabilitation in urban areas poses very different technical challenges than those in rural environments, but can also be an opportunity. An example of this is the case of Maputo, Mozambique where MSF (Médecins Sans Frontières) after the floods in 2000 put in a system of water, sanitation, drainage, waste collection and hygiene education in a suburb, and empowered a local association to manage it. In 2011, ten years later, this is still functioning and provides a safer living environment with less cholera and other water related diseases than before. Functioning drainage plays a key role in avoiding flooding of the sanitation systems (Marculino Chemane, WaterAid Maputo, personal communication in 2011).

Disasters can thus act like a "wake up" call to trigger more investment in risk reduction, which also decreases the need for response in the future. A lack of risk reduction prior to a disaster makes the response more difficult after a disaster. For example, in Haiti, the sanitation systems prior to the earthquake were inadequate where many people used plastic bags ("flying toilets") or open defecation.

The solutions developed can provide livelihood opportunities in local communities for organisations like health clubs, women clubs, artisans, operators, manufacturers and the list goes on. A prime example being the production of toilet slabs which can be set up a few weeks after the disaster event. The motivation and social mobilisation is crucial for successful reconstruction, which also involves reconstructing the local economy and society.

9 Feasibility for reuse of nutrients

The UDDT (urine diversion dehydration toilet), can enable the reuse of urine and dried faecal matter. In the past, UDDTs have been used for sanitation provision during and after the emergency situation, and this was documented for El Salvador (hurricane in 1998), Afghanistan (civil war in 1992-1995), Guara Guara in Mozambique (after floods in 2000) and Pakistan (earthquake, October 2005). The UDDTs, without reuse activities, were successfully applied in the long-term phase of the emergency with a possibility that the reuse function could be activated later if demanded or feasible (Mwase, 2006).

Refugee camps in Nepal reuse the compost from double vault VIP latrines (Ganai, 2008). In the Farchana refugee camp in eastern Chad, the NGO SECADEV overcame constraints of limited space and unstable soils by building family pit latrines with simple urine diversion. These pits can be emptied once full and SECADEV is planning to incorporate a reuse component (Patinet, 2010). Biogas was generated in Haiti[7].

Enabling environment for reuse of treated excreta

- Where growing crops is possible. There is often some kind of agricultural activity in refugee camps.
- Social acceptance is needed.
- When it is feasible to educate, train and manage the facilities properly, preferably in collaboration with local agricultural extension workers.
- Reuse is mainly a household option, but could also be practiced at a communal level if managed correctly by following the existing WHO guidelines on the safe use of excreta in agriculture. Health risks from reuse activities are lower within a single family system compared to communal toilets and where the fertiliser produced or fertilised products are sold to others.

Box 6: Compost sale in emergencies

After the earthquake in 2010, SOIL conducted a study to identify possible markets for the sale of compost generated by toilets in Haiti. Results show that a few stores were very positive about the opportunity to switch from imported chemical fertiliser to a locally produced organic fertiliser. Most significantly, none of the organisations contacted said they would rule out the future possibility of purchasing compost if they were not already using it. With compost sales alone, reuse projects are unlikely to break even at their current scale in Haiti because the cost to produce toilet compost exceeds the current market rate for compost in Haiti.

Source: SOIL, 2011

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[6] For more information see www.borda-net.org/fileadmin/borda-net/Service_Packages/04EmSan_web.pdf

[7] For more information see blog entry posted by Gui Castagna, on http://susanawg8.wordpress.com/ (13 February, 2011)

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More documents on this topic can be found on http://susana.org/working-groups/wg08 or on the blog of this working group http://susanawg8.wordpress.com/.

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