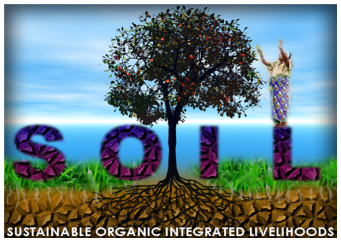


time it is emptied. However Haiti is a very humid climate and we have found that decomposition and sterilization do not take place in the chambers of our toilets. As such, we recommend rigorous pathogen testing or secondary composting before using the material in the chamber for agriculture.

B. UD toilet with drum: When SOIL began an emergency EcoSan program in Port-au-Prince following the 2010 earthquake we changed to a drum system whereby a 15 gallon plastic drum is placed beneath the toilet to collect poop and carbon material. When the drum is full it is removed and replaced. The removed drum can then be sealed awaiting collection for transport to the compost site. This system requires less handling of wastes but maintenance must happen on a regular basis as opposed to semi annually, as with the double vault model. This system works particularly well when there is extensive usage of the toilet and when offsite composting is required.

C. Portable UD toilet: Following the earthquake over 4000 portable toilet units were brought into the country. As organizations are now shifting their focus from emergency response to long-term development projects, many of these toilets are not currently being used. Portable toilets are extraordinarily expensive to service and maintain. SOIL engineers have modified these extra portable toilets to serve as UD toilets by installing the separating seat and placing a 15 gallon drum beneath the seat. Urine can be collected or diverted into an underground soak away. These toilets are excellent for communal toilets in camps (as they have very low space requirements and lock easily) or for use at community events and festivals.

Table 1: SOIL Toilet Types and Lessons Learned

Toilet type	**Positive**	**Negative**
Arborloo	Cheap	Requires a lot of space
	Trees are produced	Floods easily
	No handling of wastes	Not near water source
	Easy for young children	
Humanure toilet	Cheap	Heavy to transport
	Easily removable	Increased cover needed
	Space requirements low	Bucket close to seat
	Conserve urine	Fill quickly
	Easy for children	
Double Vault Toilet	Infrequent waste handling	Expensive
	Long lasting design	Difficult to empty
UD Toilet with drums	Easy to empty	Regular drum removal
	Less contact with wastes	
Portable UD unit	Easy to transport	Urine clogs easily
	Space requirements low	Bucket close to seat

Although the toilet design is certainly an important aspect of any project, the importance of community acceptance cannot be underplayed. We have found that projects are only sustainable when they are demand driven, meaning that the availability of hardware does not guarantee acceptance by the community. This guide encompasses both the technical and social aspects of EcoSan but it should be noted that social implementation strategies are likely to be more widely variant among communities than technical design, so it is important to work with local actors who know the needs and desires of their communities

and are able to help develop a social marketing strategy to create demand for EcoSan systems.

The section which follows includes a detailed overview of community education, toilet management and technical designs based on SOIL's experience in Haiti. Examples of several case studies are provided.

It should be noted that this guide is a work in progress and we plan to send frequent updates to our network. Please contact us if you have suggestions for expansion of the guide or if necessary details or explanations are lacking.

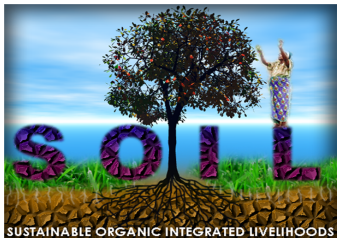
Managing Urine Diversion Toilets

While the development of an appropriate design and the actual construction of the toilets are necessary for a successful project, effective management of the toilets is an ongoing requirement that keeps the toilets functioning and clean. Whether the responsibility for the upkeep of toilets falls to members of a household, a community organization or a paid employee, routine maintenance by the operator is essential for the continued, hygienic function of the urine diversion (UD) toilets. Routine repairs should also be the responsibility of the operator while more extensive repairs to the structure are the responsibility of the individuals/group that installed the toilets. While SOIL has found there are many differences between maintenance programs for community-run public toilets and paid public toilets, there are a number of essential points to appropriately maintaining both types of toilets.

Operator Responsibilities:

- Routine cleaning of toilet pedestal to ensure good hygiene and proper use. **Care should be taken to prevent chemicals from entering into the poop drum as this will ruin the composting process.**
- Cleaning inside and outside of the toilet structure.
- Verifying that sufficient cover material is being applied by users.
- Making cover material available to each user.
- Timely removal and storage of filled drums to avoid any human-fecal contact from overfilled drums.
- Proper installation of drums with the help of the guide in the bottom chambers.
- Periodic verification of clear and functioning urine pipes to avoid blockages in the seat's drain.
- Provision of toilet paper and appropriate disposal of used toilet paper.
- Provision of water and soap for the hand washing system.
- Ensuring that the toilets are accessible to all members of the targeted population.
- Educating first-time users on the basic steps of using a urine-diversion toilet.

Management schemes will vary widely depending on a number of factors, including but not limited to: location, population, access to cover material, funds available to employ toilet operators, etc. Organizations or groups planning on installing UD toilets must commit to working with the targeted



communities to identify management schemes that are appropriate for both parties. Interested organizations also must be prepared to adapt to changing needs and concerns that can affect the management and functioning of the installed toilets. Over the past 5 years, SOIL has gained experience from projects in Cap-Haitien as well as in Port-au-Prince implementing both paid-public toilets and community-managed toilets.

Case Study 1: Community-Managed Public Toilets

From 2006 to 2009, SOIL installed over fifty UD toilets in Haiti, with 36 of them concentrated in Cap-Haitien and the surrounding areas of the North Department. Some of these toilets were built at the request of city officials with assurances that individuals would be employed by local government to maintain the toilets. The large majority of these toilets, however, were built after community leaders and local organizations made specific, written requests to SOIL for ecological sanitation toilets to be built in their community.

All of these toilets were installed as double vault urine diversion toilets with composting occurring in the toilet chamber. SOIL's role in maintaining these toilets was limited to periodic check-ins and responding to significant repair requests. SOIL also maintained responsibility for the emptying of the vaults after the toilets became full (typically a 6-9 month period).

<u>Lessons learned</u>

1. Toilets that were installed as a result of formal requests by community groups/organizations were often better managed. This demand-driven model can and should be applied in other contexts to improve ownership of the facilities by the community.
2. Responsibility of finding carbon-rich cover material should not be placed on individual users. In order to ensure that there will be sufficient amounts of an appropriate cover material, implementing groups must identify a large source and make sure it is routinely transported to toilet sites either by the implementing organization or the community group responsible for the toilet.
3. Adequate decomposition of feces was not able to occur in the 6-9 month collection period due to a combination of a humid climate and insufficient cover material put in by users. A large compost site was opened in the fall of 2009 to facilitate the secondary composting phase for the contents of the vaults when emptied. Toilets located in rural areas had individual compost sites that were located immediately adjacent to the toilets.

4. Collaboration with local authorities produced few results, as promises to hire operators to manage the toilet were not kept. Installation of toilets in certain areas at the request of local authorities often proved to be politically motivated.
5. Toilets that were installed at schools and churches were generally better maintained as the responsibility was taken up by members already committed to the general upkeep of the respective institutions.
6. Public toilets that were not managed by paid operators were not well maintained and resulted in unhygienic facilities. This, in turn, led to low usage of the toilets, thus alternative practices persisted (open defecation, use of canals, plastic bags, etc.).

Moving forward

As a result of the lessons learned from the past four years in Cap-Haitien and the past year in Port-au-Prince, toilets in the urban area of Cap-Haitien have been modified: Onsite composting using vault toilets has been replaced by offsite composting using the removable 15 gallon drum system. The new system requires supporting infrastructure including: A drum collection and delivery service provided by the Cap-Haitien SOIL office, and a secondary composting site located in Limonade (a short distance from downtown Cap-Haitien). The photos below show how the vault toilet chamber has been modified with the drum system:

In addition, in response to the cholera outbreak SOIL has employed toilet operators in some of the urban, public toilets to ensure that these remain open, functioning and adequately clean. Periodic supervision of the toilets and the toilet operators has also been put in place to provide feedback and education to toilet operators when necessary to continue to improve the management of the toilets.

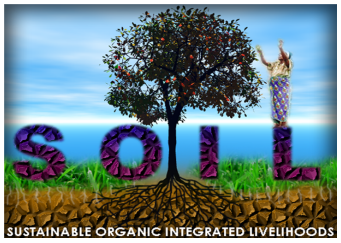
Case Study 2: Public Toilets in IDP Camps

Soon after the earthquake on January 12th, 2010, SOIL, with the financial assistance of Oxfam Great Britain (GB), introduced ecological sanitation to IDP camps, schools and churches within the Port-au-Prince metropolitan area. While many of the sites were identified by SOIL as in need of sanitation services, committees from other sites approached SOIL staff in the field or made requests at our office upon hearing of the project and testimonies from individuals at other sites where SOIL was functioning. Urine diversion toilets, modified from the double vault system to the current single vault system that utilizes 15 gallon drums, were installed in 32 different sites.

By August of 2010, SOIL had installed 196 toilets across these 32 sites with the majority of them spread across the communes of Cite Soleil, Tabarre and Delmas. At the peak of displaced populations living in spontaneous camps, the number of beneficiaries for these toilets was an estimated 20,600 individuals. For the construction aspect of this project, over 130 masons and carpenters were trained and hired in ecological sanitation construction. All toilets were separated into men, women and child facilities and privacy for users was assured by the installation of locks in each toilet. Collection and delivery of drums for each site occurred once a week, with cover material provided at most sites in large quantities from time to time. At sites where space allowed, 125 gallon rainwater fed stations were constructed to provide water for hand-washing. Other sites had smaller buckets along with taps to ensure that all users could wash hands.

At each site, the committees played an essential role in the implementation and ongoing management of SOIL's program. Their responsibilities included:

- Introducing SOIL to the site (either by request at SOIL office or sought out by SOIL staff on first visit).
- Taking part in the initial ecological sanitation education seminar and making a decision as to whether this sanitation option was appropriate and desirable for the particular site.



- With SOIL engineers, identifying location, quantity, and type of toilets to be installed by SOIL.
- Identifying carpenters, masons, and other laborers for the construction phase of the project.
- Nominating a representative who remained in regular contact with SOIL, reporting toilets in need of repair, cleaning material needs, and any other social issues that may come up.
- Assisted employing and supervising toilet operators for all public toilets (200 HTG for each 8 hour shift). Some committees appointed 2 individuals responsible for maintaining the toilets while others employed systems that resembled Cash-For-Work programs where toilet operators changed every week or every 2 weeks.

All cleaning materials needed for the toilets were provided, including but not limited to: bleach, disinfectant, toilet paper, insect spray, brooms, gloves, masks and liquid soap. Depending on the system employed by each site, the identified representative(s) would come to the SOIL office to pick up payment for the toilet operators as well as the necessary cleaning supplies. At larger sites, depots were identified and cleaning materials were able to be stored for one month at a time.

In terms of monitoring, SOIL's site supervisors would visit each site at least twice each week, verifying the quality of maintenance provided by the toilet operator as well as identifying any repairs that needed to be completed. These regular visits by SOIL staff worked to further develop relationships with the committees as well as the populations and allowed for early identification of potential problems within each site. Although initially all repairs were done by SOIL staff, committee members in many of the sites were trained on how to deal with the periodic plumbing issues to ensure that repairs were made as quickly as possible and that the toilets remained open and functioning.

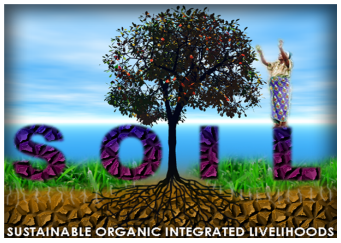
Lessons learned

1. We found it critical to our program to develop and maintain solid relationships with the camp committees in order to receive feedback on toilet design as well as management. Furthermore, it created a sense of empowerment among committee members where they felt directly involved in the project and thus were committed to maintaining and promoting the toilets.

2. Increasing participation of committees in other activities of SOIL (seminars on ecological sanitation, visits to compost site) can improve understanding of overall program and can indirectly improve management of toilets.
3. It is essential to pay operators to take care of public toilets. Other programs where toilets where the responsibility of the camp committee or other individuals on a voluntary basis were often not well maintained.
4. Operators employed for one or two weeks at a time were often not effectively trained by committees to properly manage the toilets. Long-term operators, however, were able to develop relationships with SOIL staff and committee and continuously improve on the management of the toilets.

A toilet operator moves a clean empty drum into a SOIL UD toilet.

5. The appearance of toilets can be linked to quality of management, as a good-looking toilet can instill a sense of pride and motivate operators to manage the toilets well and keep them clean.
6. Without controls on cleaning supplies excess amounts are used and in some camps may have been sold by the committees. Monitoring usage of cleaning supplies at each site and using model sites to estimate appropriate quantities for other sites can help to reduce these costs.
7. The most common problem with the toilet is the clogging of urine pipes, which can be traced back to plumbing as well as management issues (see toilet photos document). A potential solution to the management side of this could be putting the responsibility for adding cover material solely in the hands of the toilet operator.
8. Regular supervision improves toilet management and enables repairs and other issues to be dealt with rapidly.
9. Providing each toilet facility with a garbage can lead to an improved appearance in the area outside the toilet as well as reducing the potential for trash to be put into the toilets.
10. Monitoring of drums is necessary to prevent theft but also enabled SOIL to track sites that were either not using sufficient cover material or



were unable to prevent users from disposing of other materials in drums that could negatively affect the composting process.

11. Men continue to urinate outdoors. Urinals were installed at all sites, but did not solve the problem. Increased promotion is needed to increase usage of urinals by men.
12. Most people will wash their hands if provided with adequate facilities. Each site was upgraded to include rainwater catchment systems, larger reservoirs, and adequate liquid soap in order to ensure that hand washing would be available.

Moving forward

In general, the almost 200 toilets that have been installed in sites across Port-au-Prince continue to function properly and have been a tremendous success.

SOIL is currently transitioning away from systems which place large amounts of control in the hands of the camp committee (cleaning materials, the selection of toilet operators, facilitating payments, etc.) and systems with a high turnover of toilet operators.

SOIL is putting more responsibility in the hands of toilet operators, training individuals on ecological sanitation and how to perform simple plumbing and structural repairs.

The next edition of The SOIL Guide to EcoSan will include a case study on communal toilets. This toilet management approach will be implemented in small camps where there is adequate space to provide several families with a toilet of their own. Each family will have a key to the communal toilet and all families will be responsible for managing it, thereby obviating the need for paid toilet managers.

Community Outreach and Education

Initial Training with Community Representatives

The initial education and training of potential users is perhaps the most important step of realizing a successful ecological sanitation (EcoSan) project. While SOIL has experienced extremely high user acceptance with projects in Haiti, failure to properly approach and educate users from the start would seriously hinder an EcoSan project's chances. Improper use of urine diversion (UD) toilets could result in low user acceptance not only due to the inevitable smells and fly-breeding but also because of the extremely unhygienic conditions for toilet managers and those that are emptying/cleaning the toilet drums that arise from misuse of toilets.

Initial meeting w/Dotwa IDP camp committee, Port-au-Prince, June 2010

Assuming that the local population has already been contacted or has made a specific request for the installation of an EcoSan toilet, the first step is a formal meeting with these individuals or groups.

This initial meeting with the committee or community offers an opportunity for hygiene promotion and general education around the benefits of proper sanitation as well as a forum to introduce ecological sanitation as a viable solution to sanitation needs. Prior to constructing any toilets, the community should not only understand the differences between EcoSan toilets and other existing sanitation options, but also understand the benefits and responsibilities that come along with operating and managing a EcoSan toilet. Below is an example of a meeting outline that SOIL has utilized in approaching communities new to EcoSan.

Community Meeting Outline

1. Introduction of committee/community members, as well as partners present.
2. Explanation by community members of current sanitation situation.

3. Explanation of what ecological sanitation is by a SOIL representative
4. Introduction of benefits of EcoSan in regards to a population's health, the environment and for those working in the agricultural sector. Also, the benefits of EcoSan in comparison to other traditional sanitation options should be stressed here.
5. Present the different types of EcoSan toilets and how different interventions depend on a variety of factors (water table, resources available, space, land owner issues).
6. Present SOIL's compost site set-up, how pathogens are killed, the testing for pathogens as well as nutrients, and what will be done with the final compost.
7. Proper use of UD toilets, which includes a participatory activity that engages the audience and allows them to act out in front of others how to properly use the UD toilet (materials required: separating seat, toilet paper, bagas, willing participants). For participatory activity, see "11 Steps to Using a Urine Diversion Toilet" in sections T4 and T5.
8. Responsibilities of toilet operator in keeping the toilet(s) functioning properly (see general management section).
9. Discuss possible management solutions with the committee that take into account capacity of partners and resources available.
10. Explanation of collection/distribution system that ensures constant access to cover material as well as a long-term (1-2 weeks) stock of drums.
11. General Q&A.
12. Committee decides if they would like to move forward with EcoSan or whether they would rather have SOIL identify another organization that can help with more traditional options. If there is general agreement, it is possible to identify the location for the toilets immediately.

Once the community or committee has decided that they would like to implement an EcoSan program, the construction phase begins. To further integrate the community into the project, the construction of the toilets should include carpenters, masons and laborers from the same community as much as possible. Once the toilets are finished, these individuals should have a general understanding of the technical aspects of the toilets and can

be called upon for repairs when needed.

Educating the General Population

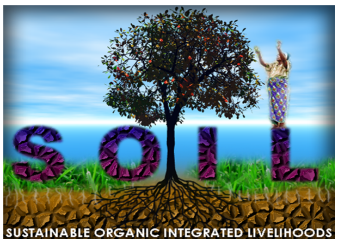
Prior to opening the toilet for use by the larger population, implementing organizations should discuss with the committee or community organization about the most appropriate method of educating households regarding ecological sanitation and how to properly use the toilets. Where time and funds allow, the method that ensures almost 100% of families gain a sufficient understanding of the toilets is one where hygiene promoters can do door-to-door education campaigns within the area where the toilets are located. This two-way communication method is unique in that it allows each user the opportunity to ask questions and voice doubts and it provides the implementing organization with valuable data on the perceptions of users prior to the toilets being opened. Focus should be put on having each household know the "11 Steps to Using a Urine Diversion Toilet" (see sections T4 and T5).

In situations where door-to-door education campaigns are not possible, community events can be organized with the community to draw large audiences and allow one education seminar to reach a large number of people. As one cannot expect all members of a community to be present at one inauguration, the goal is to educate those present and have the message diffuse to others via relationships within and between families, friends and neighbors.

Well-known Haitian musician BelO performing at an inauguration in Port-au-Prince, 2010

Inaugurations

Approaches to inaugurations are different from the initial education seminar done for the community leaders. While the initial meeting's objective is for individuals to gain a comprehensive understanding of ecological sanitation, proper use of the toilets, and the responsibilities for the committee, the inaugurations should focus on proper use of the toilets. While the animator/emcee should take the opportunity of to communicate the basics of ecological sanitation, the presentation should build towards the participatory activity: "11 Steps to



Using a Urine Diversion Toilet"

To increase attendance and interest in the event, implementing organizations should look to the community leaders to mobilize large numbers of people. Any opportunity to collaborate with local musicians or comedians will increase interest in the event and give more weight to messages you are trying to get across.

Effective Strategies for Inauguration Events

- Effectively scheduling when majority of population is likely to be available (often Friday or Saturday evenings)
- Making use of visuals and photos (existing toilets, compost site, experimental gardens)
- Attendance and endorsement by well-known local personalities to increase interest
- Animator/emcee should be an experienced community mobilizer and should be able to engage a large audience around a topic that is not commonly focused on, i.e. toilets
- Education portion should build up to the participatory activity, which concludes the educational portion of the event