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## Collapsing latrines: how this was dealt with in the Pan-Africa programme

### **Introduction**

*In 2007, Plan International introduced Community Led Total Sanitation (CLTS) in Africa, as one of the approaches to achieving its child survival and development goals. In the last six years, 10 Plan Country Programmes in the Region of Eastern and Southern Africa have already adopted CLTS as the main approach to promoting sanitation at scale. This Pan- African CLTS Programme is one of the efforts of Plan International to promote sanitation at scale beyond the national and regional boundaries. The project was launched in January 2010 as a multi-country initiative that involves 5 countries of Eastern & Southern Africa (Kenya, Ethiopia, Uganda, Malawi and Zambia) and 3 countries from West Africa (Sierra Leon, Ghana and Niger). One of the aspects that is noticeable in the programme is the weak structures of the latrines that are built by the households. Based on this analysis, the following provides some useful tips around what is the best means of construction.*

### **The Community Led Total Sanitation approach**

The implementation of the Community Led Total Sanitation (CLTS) approach has facilitated behaviour change and consequently inspired households in Open Defecation Free (ODF) communities to construct latrines using locally available resources and knowledge. However, as seen within the Pan-Africa programme, the issue of collapsing latrines is considered a challenge. What is of interest is the way that the different Plan country offices have dealt with this specific technical issue.

### **Issues around weak constructed latrines**

Inevitably, issues ranging from terrain, soil texture to climate e.g. heavy rains (high water tables) can all affect the durability of the latrines constructed by communities. It is notable to reflect on how a number of communities within the various countries in the programme have come up with several local solutions to address this issue of collapsing latrines. Based on the overview of the eight countries in the Pan-Africa programme, a total of four countries cited very specific solutions.

Notoriously, the lack of quality soil plays a strong role in the collapsing latrines. In order to avoid latrines from collapsing, due to poor soil conditions, it is important to: use round pits; introduce pit linings; and reduce pit dimensions.

In this brief overview paper, first a focus is placed on some overall information about latrine construction and then attention is placed on some of the innovative solutions from the Plan country offices, followed by an interesting case study.

Below are a few key tips around building a simple latrine:

#### **A. Round pits**

In areas where there is a tradition of building latrines the population have already discovered that round pits are more stable than rectangular ones. Round pit linings are very stable and can be made relatively cheaply, while rectangular pit linings are structurally unsound and need to be made with strong building materials.

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*This brief overview on collapsing latrines is meant for a range of stakeholders from managers supporting the implementation of a CLTS led programme to CLTS trainers whom are working in the field. This is meant to give some useful information to the reader that they can apply in their work.*

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### **B. Introduce pit linings**

Pit linings should therefore if possible be made round. The material used will depend on what is available and affordable. (See the pictures in the left hand column). This is only possible if the pit is lined. Lining material may be difficult to find or too expensive to use. In such cases the solution is to reduce the pit diameter.

### **C. Reduce pit dimensions**

Apart from the shape, size also influences pit stability, and the risk of collapse. Pits with small diameters are more stable than pits with large diameters.

In areas of unstable soil it may be tempting to compensate for the poor depth by making pits wider to achieve a reasonable volume.

### **D. Depth of the pit**

Pits in unstable soils should not be made too deep as a pit collapse during the excavation may have serious consequences for the people digging. It should be possible to dig a 2 meters pit with relative safety for the builders. Should the soil collapse it would only fill half of the pit, and the person at the bottom would only be covered up to waist level. This should allow the person to breathe while help is organized.

## **Applying conditions in the Pan-Africa programme**

The following are unique examples of how the different Plan country offices dealt with the issue of maintaining latrines to avoid them from collapsing, namely:

### **Uganda:**

- Community members use old motor oil to paint the logs used as foundations for pit latrines. The motor oil helps to repel insects like termites due to the smell;
- Tobacco leaves are used to smoke the logs before making the foundation and slab of the latrines. The smell of tobacco leaves helps to repel termites;
- The foundation of the latrine is lined with a number of layers of baked bricks to make a corbelled foundation. This helps to make the walls of the latrine pit strong;
- Wood ash can also be used to repel termites by sprinkling it around the logs and the latrines.

### **Ghana:**

- To address the issue of collapsing pits community members, coconut milk residue is grated and put on top of latrine roofs to attract ants which eat up termites;
- Community members are encouraged to build latrines on anthills, raised ground or small hills;
- With bio fill toilets, a certain type of leaves is added to the faeces in the latrines. They help to speed up decomposition into organic matter which can then be used as fertilizer in the garden;
- Old barrels/drums are used to line and reinforce the pit to prevent latrine collapse where the soil is loose.

### **Malawi:**

- Interwoven wooden logs just like those used to make granaries are made considering the size of the latrine pit and slotted into pit;
- Bamboo sticks are cut longitudinally and interwoven into a granary shape and slotted into the pit hole;
- The foundation of the latrine is lined with a number of layers of baked bricks to make a corbelled foundation. This helps to make the walls of the latrine pit strong;

## Types of latrine linings

Diagram 1: Lining with burnt bricks

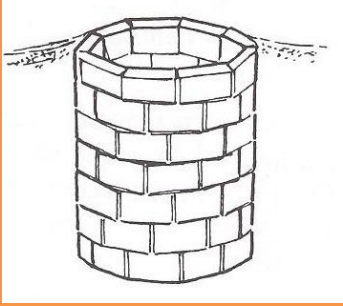


Diagram 2: Lining with stones

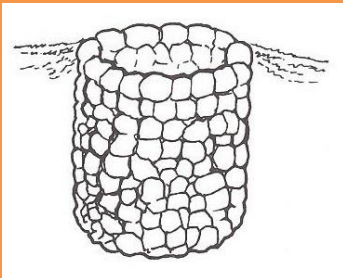


Diagram 3: Lining of oil drums

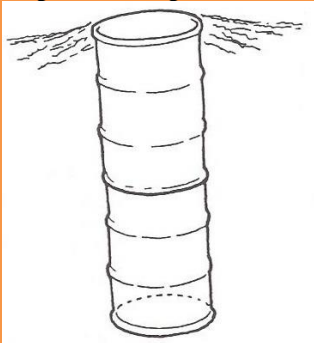
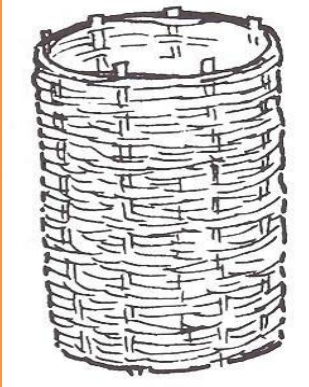


Diagram 4: Lining with wooden basket



- Old drums are used to line and reinforce the pit to prevent latrine collapse where the soil is loose.

### Zambia:

- Bamboo sticks are cut longitudinally and interwoven into a granary shape and lotted into the pit hole.

### Costing of pit latrines

#### PIT MADE AFTER CLTS TRAINING

**Median cost of household (HH) investment:** 2,000 KES (US\$ 24) labour

**Types:** Usually round pits of around 2 metres deep and 1 metre in diameter.

**Features:** deep pits are thought to increase lifespan of structure; however, pit collapse is common – causing consumers to pay recurrent costs to rebuild and replace their slab.

#### SLAB

**Median cost of HH investment:** 700 KES (US\$ 8) labor; 1,500 KES (US\$ 18) materials

**Material:** common options include packed mud, timber, concrete (poured and pre-cast)

**Features:** mud and wood are considered inferior to poured concrete, but concrete slabs are typically poured directly over wooden support beams, which rot and buckle, leading to breakage and loss of investment; the vast majority of slabs have no lid or cover.

#### SHELTER

**Median cost of HH investment:** 1,000 KES (US\$ 12) labor; 2,000 KES (US\$ 24) materials

**Material:** typically matches composition of the home; commonly mud and stick, mud block, mud and stone, *mabati* (metal sheet), timber, concrete plaster, polythene or plastic sheet

**Features:** concrete and stone walls with a *mabati* roof are perceived as the ideal, but mud and wood structures are most common.

### *Case study from Niger - Repelling Termites: Tobacco treated wood, solution to durable latrine construction*

The Dosso and Tillaberi communities in Niger face many challenges one of them being termites' attack against the wood they use to construct latrines. Their termites' attack is a source of danger thus the latrines could collapse at any time.

The main challenge for people living in these communities is to construct good quality and durable latrines using local materials. This became a welcome challenge for Daouda Djibo, a well-known mason from Sandidey community in Dosso area. He battled with the problem and came up with an innovative method to protect wood dedicated to construction of latrines.

Djibo realized that when he treats the wood with tobacco extracts, it became durable and termites could not attack it. His method is simple: the tobacco is immersed in water for 24 hours. Thereafter, the liquid is collected and mixed with the clay to be used for the latrine construction. It is then applied to the

entire wood. The covered wood is then protected against termites' attack and could sustain the latrine construction for a long period.

When Mason Djibo is asked about his innovation, he says, "I have noticed that the most vulnerable component of a latrine is the wood which is usually attacked by termites and other insects. Knowing that tobacco has a strong odour, I presumed that it could repel termites".

Daouda tested his method and after several months he reached the following conclusion: latrines constructed with treated wood remain strong. The "tobacco solution" is now used by community masons to build durable latrines. The popularization of this method is encouraged by Plan Niger with the inventor Daouda Djibo who is keen to share his knowledge with colleagues. Plan Niger regularly holds training sessions for masons to build sustainable and affordable latrines using local materials and indigenous techniques.

***Relevant sources of information:***

One pagers on the CLTS Website: Local solutions for dealing with latrines

<http://www.communityledtotalsanitation.org/resource/local-solutions-dealing-termites>

And Termite-proofing wood used for latrine construction

<http://www.communityledtotalsanitation.org/resource/termite-proofing-wood-used-latrine-construction>

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