

# 1 OPEN SURFACE WATER DRAINAGE

This document will be a short guide, in how unlined open water drainages can be planned and constructed in the P150 communities with a minimum number of resources. Tools needed will be shovel(s), pickaxe(s), wheelbarrow(s), sledge/rock hammer (community specific). String to mark the boundaries of the drain can be a great help. Sticks can also be used.

**Community participation is crucial. They must be informed and be a part of designing, decision making, construction and maintenance.**

Before beginning any drainage construction, walk around the community and ask residents about probable cause of flooding events. They will usually be able to identify the source of water that causes the specific problems and where it is happening.

Since maps might not be an option, making a sketch of the system beforehand, will help simplify the process and create a plan of action. Not having maps in larger communities can create difficulties. Making several sketches can help solve this issue. It is important to emphasize to the locals, that there must be a system and structure to the drainages. This to ensure that water is handled all over the community and not just the most problematic places.

Afterwards call a meeting with the residents and present the proposed scheme to them for their suggestions and approval. Their intimate knowledge of the area puts them in a good position to offer practical advice.

As a rule of thumb, the sides of an unlined drain, as showed in figure 1, should slope 1 in 2 to ensure they are stable and do not collapse.

Using string to mark the drains upper width is advisable and will ease the task of constructing the correct dimensions. See figure 2.

Unlined channels of 20 inches width (a shovel blade is normally around 10inch wide) are a useful size for branches along streets and alleys. If proven too narrow, these can be widened if the need arises, and space allows it.



Figure 1 – 30, 20, 10inch drain with shovel blade (10inch) for the drain's bottom measurement. Talia

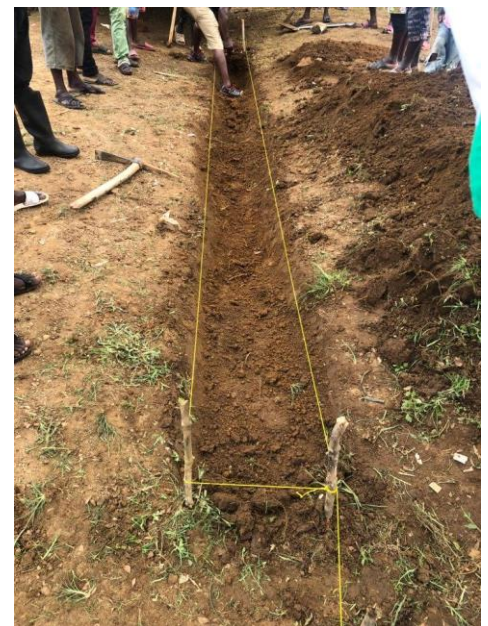


Figure 2 – Digging of minor drain with strings for dimensioning. Samie Sandima

A width of 20inches up to 40inches, or even more, can be used where large amounts of water needs to pass through (figure 3).

The use of banks and slopes is needed for the canal to be stable and not collapse, as the bottom of the canal erodes with time and when people pass on foot.

Construction of drains right next to buildings vulnerable to erosion must be avoided. A distance of 40inch (length of a shovel) must be kept from building to canal. Grass, plants, and trees should be planted on this area, between building and drain, to help prevent further erosion. See figure 4.



Figure 4 – Drain with greenery next to it. Bongor.



Figure 3 – A larger 40inch drain into junction, with banks, slopes and reinforced with sandbags protecting houses. Foindu Mameima

## 1.1 STEP-BY-STEP PROCESS

Prior to the work, obtaining a map of the community center is desirable. Ask Tity or Martin.

### Day 1:

- Walk around the area with the residents, to find out where the problems are located. Try and get an idea of, where there are smaller, medium, and large amounts of water flowing. Look on the ground and at the erosion on buildings. Also plan for where the water should be led and end up.
- Prepare a sketch of the drains, specifying small, medium, or large drain types.

### Day 2:

- Call a meeting of the residents and present the proposed scheme to them for their suggestions and approval. Their intimate knowledge of the area puts them in a good position to offer practical advice.
- Adjust plan with the additions from the locals.

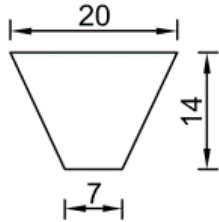
### Construction:

- Construct/dig the drainages. If working in the rainy season, you should be starting from the downstream end and work your way upstream.

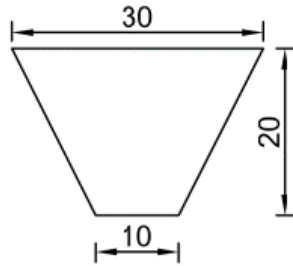
### Maintenance:

- Once the drainages have been dug, visit them after rainfall or even during heavy rainfall, to check on their functioning. This is a community/WASH committee responsibility.
- Setting up a plan for weekly/monthly maintenance, depending on season and amounts of sediments/trash taking up space in canals is crucial. Furthermore, evaluation of the drain's effectiveness and if there is need of correcting certain canal's dimensions.

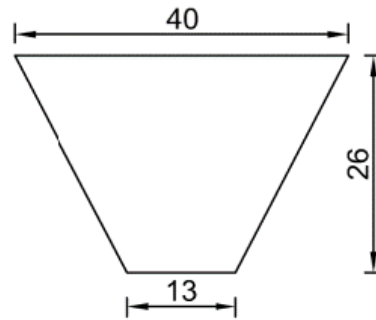
Small



Medium



Large



P150

Drainage dimensions

Measurements in inches

1 in 2 slope

Figure 5 - Drainage dimensions