



# DEVELOPING A SUSTAINABLE PROCESS FOR UPGRADING GREYWATER MANAGEMENT SYSTEMS

## Goals:

The purpose of this project is to work in close collaboration with stakeholders and community members in Langrug to create a process that could be adapted to different areas of informal settlement upgrading. This project will also produce a guidebook that describes the process in detail, the team's application of the process regarding greywater management, and other greywater management techniques found through web research.

## Problems Due to Greywater:

Greywater is produced by a variety of sources, **mostly from washing**. It can be contaminated by various **chemicals** and **germs**, which multiply in standing greywater, making pools of greywater extremely hazardous to health.

Greywater, *especially together with food waste*, has been attributed to various problems:

Sickness                      Rashes                      Smells                      Maggots



## Greywater Solutions:

Information taken from [http://www.metrocouncil.org/environment/water/bmp/CH13\\_RPPSoilVeged.pdf](http://www.metrocouncil.org/environment/water/bmp/CH13_RPPSoilVeged.pdf)

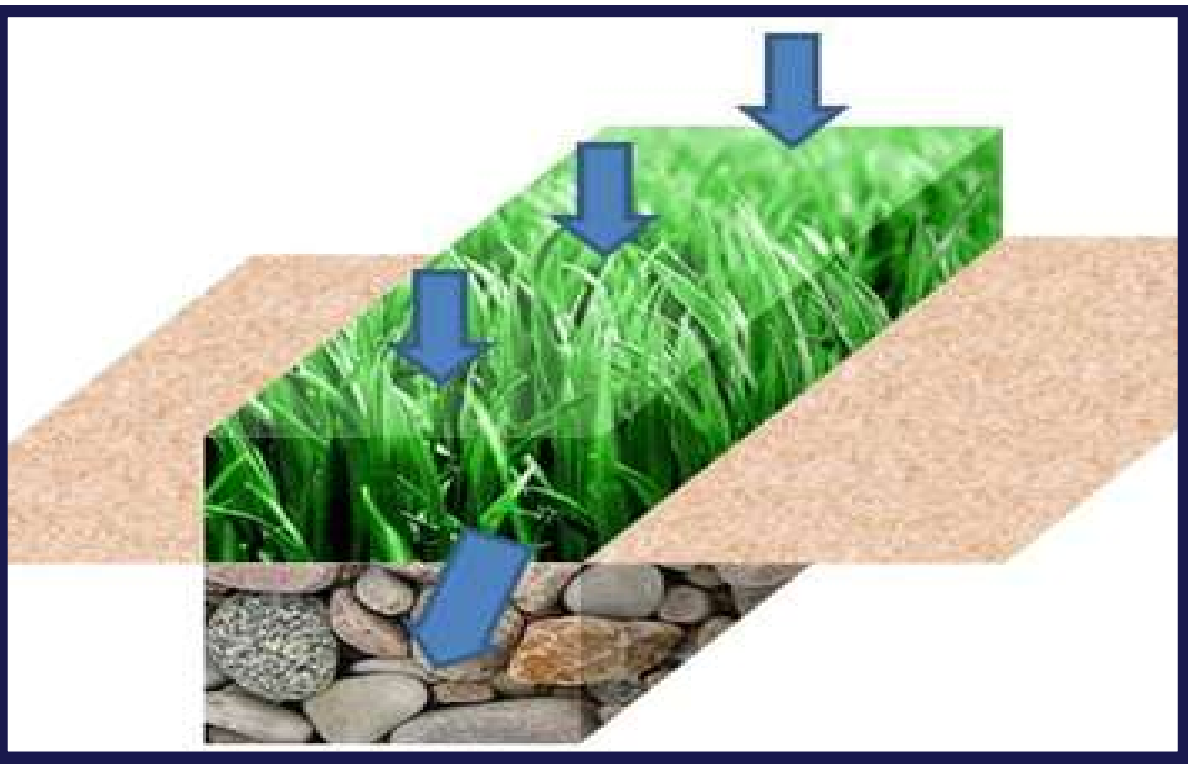
### Stones and Cement



Channel lined with stones, mortared with cement. This channel provides a smooth path for water while also spreading the impact of silt and erosion throughout the channel.

### Soakaway

Layered grass and rocks that provides a bio filter. The two different layers are designed to filter the salts and toxins out of the water before the water is directed downstream.



Picture taken from WPI Cape Town Project Centre 2010 Stormwater Guidebook

### Vegetated Channel



Picture taken from <http://www.nagreen.com/erosion-control-products/photo-degradable-extended-term.php>

A channel that uses grass in place of rocks and cement to hold the channel together. The grass holds the soil around the channel in place, as well as filtering some contaminants out of the greywater, reducing smell and bacteria growth.

## Erosion:

Erosion is the **removal of soil** from a location due to natural forces such as wind and moving water. Some greywater issues caused by erosion include:

1. Clogging of channels due to sedimentation
2. Greywater pooling
3. Channel wall collapse



To prevent erosion around greywater channels, various strategies can be used, including:  
•Vegetation  
•Blankets; mats  
•Retaining walls  
•Buried tyres  
These interventions help to **stabilize the ground** and minimize erosion.

## Maintenance:

Two major issues affecting greywater interventions are:



- Sediment
  - Trash
- Basing maintenance on **community efforts** will lead to greater sustainability. Possible strategies for establishing community involvement in cleaning include:

- Setting up a cleaning schedule
  - Assigning sections of the channel to different people for regular cleaning
  - Requesting that EPWP workers help to clean the channel
- Logistical support from the municipal **government and partnering NGOs** will facilitate effective maintenance. It is necessary that all stakeholders be informed and on board with maintenance; so **regular meetings** - especially among the community members - are valuable for organising cleaning.

## Social Factors:

One consideration involved in community-based greywater system upgrading is the motivation for community involvement. Two main paradigms for motivation are:

- **Volunteer-based self-help**
- **Short-term employment**

Each approach has its own set of advantages and disadvantages:

Approach:	Volunteer	Employment
Advantages:	<ul style="list-style-type: none"><li>• Community ownership</li><li>• Encourages ongoing commitment</li></ul>	<ul style="list-style-type: none"><li>• Encourages extensive community involvement</li><li>• Job creation</li></ul>
Disadvantages:	<ul style="list-style-type: none"><li>• Hard to get community involved in areas with high unemployment</li></ul>	<ul style="list-style-type: none"><li>• High Cost</li><li>• Could interfere with sense of community ownership</li></ul>