SSWM

sustainable sanitation
and water management

Greywater Towers

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Contents

1. Concept

Background

Greywater is the wastewater from bath, laundry and kitchen and contains nutrients.

It accounts for around 50 to 80% of the residential wastewater with manageable contamination levels.

It therefore offers great potential for reuse in agriculture, particularly in areas where water is scarce.

Greywater towers are low-cost solutions that allow for the reuse of the water and nutrient content in greywater and productively using it for gardening purposes.

(adapted from SHEWA et al. 2009)

1. Concept

Working principle

- Greywater towers are cylindrical and made out of simple plastic bags or clothes
- They are reinforced with wooden poles, filled with a soil mix (soil, ash and/or compost/vermicompost) and anchored into the soil
- Vegetables are grown in holes cut in the sides of the bag
- Each day, the available greywater is poured into the bag
- The soapy water contains nutrient on which vegetables can grow successfully
- The soapy water can be cleared out of the system by pouring two buckets of clean water into the column once a week

(adapted from IWRM et al. 2008, KULABAKO et al. 2009, ROSA et al. 2006)

Greywater tower where greywater is directly poured into the bag

Source: SHEWA (2009)

2. How it can optimize SSWM

Implementation and use of Greywater Towers can help in optimizing your local water management and sanitation system and make it more sustainable by:

- Making use of the water and nutrient content in greywater
- Producing vegetables at a household level and increasing household food security
- Avoiding the direct discharge into the environment and thus preventing eutrophication of water sources, health hazards etc.

3. Design Principles

- A circle has to be marked out on the ground with a diameter of around 80 cm
- The bottom layer of the tower has to be dug out and the wooden side poles need to be firmly planted into the ground
- A shade cloth will be wrapped around the poles

Construction of a Greywater Tower in Arba Minch Town, Ethiopia. *Source: SHEWA (2009)*

3. Design Principles

- The resulting cylinder will be filled with gravel in the middle and the soil mix all around. A bucket with its bottom removed can be used when filling the bag
- The procedure of placing the bucket, filling it with stones, backfill it and then remove the bucket has to be repeated for each soil layer until the top layer of the greywater tower (around 1 m in height).

Construction of a Greywater Tower in Arba Minch Town, Ethiopia. *Source: SHEWA (2009)*

4. Operation and Maintenance

- Little labour for construction and little operation and maintenance is required
- Once people have become familiar with the towers, they are easily maintained
- The towers can be positioned right at the back door so that it is easy to pour the wastewater into the tower
- Difficult to predict how much water is required
- Necessary experience will come over time
- In the beginning it is recommended to apply around 20 litre per day and fine-tune it according to the exact water demand

Greywater Tower in Arba Minch Town, Ethiopia *Source: SHEWA (2009)*

5. Applicability

Greywater towers:

- Can be installed in all types of climates, but are particularly suitable in warmer climates to allow for a year-round reuse of greywater
- Are particularly recommended in water-scarce areas
- Are a good alternative in urban and peri-urban areas in many developing countries, where greywater is often discharged untreated on the soil or into ground and surface water sources, resulting in bad smell and stagnant water, risk for malaria, diarrhoea and other waterborne diseases

(adapted KULABAKO et al. 2009, ROSA et al.2006)

6. Advantages and Disadvantages

Advantages:

- Minimal space required
- Little investment costs and maintenance labour
- Can be implemented close to the source/household
- Contribution to household food security and alleviation of food shortages and poverty
- Reduction of environmental degradation, eutrophication of water sources and health hazards
- Reuse of valuable water and nutrient resources

Disadvantages:

•Difficult to estimate the effective need for greywater and not very adapted for large fluctuations

•Unpleasant odours may appear

•Some space for setting up the greywater towers close to the housing is required

•Difficult in countries with a cold climate that do not have a continues growing season

7. References

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