

The Sanitation Decision Support tool

Results of the Sanitation Decision Support Tool. The tool was created by WASTE (www.waste.nl) and the Akvo Foundation (www.akvo.org), in order to assist people in choosing sanitation technologies. We hope this tool proves useful, any comments can be send to m.t.westra@akvo.org.

Session information

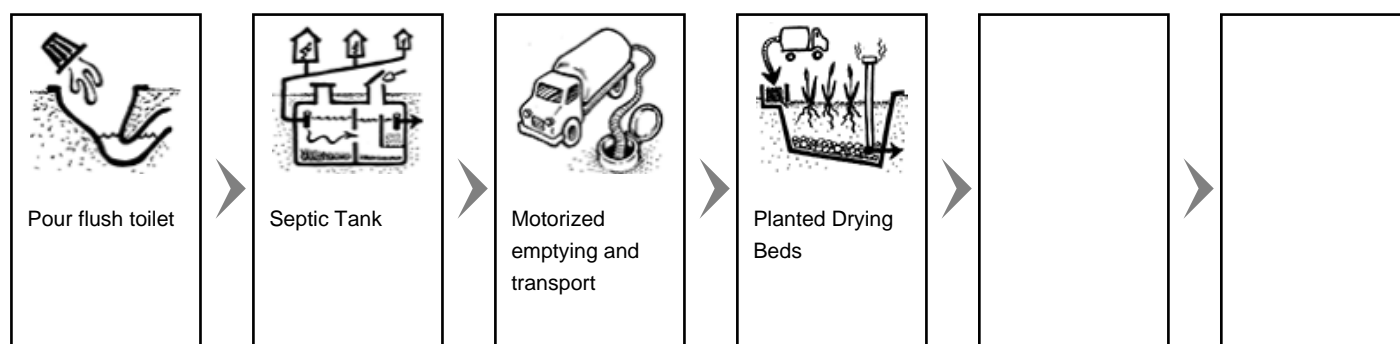
Date: Tue Sep 29, 2020

Time: 11:35:53

Options chosen

Water supply (one possible) <ul style="list-style-type: none">• none• <u>fetch</u>ed / <u>hand-pump</u> / <u>standpipe</u> / <u>tanker</u>• connection	Groundwater table (one possible) <ul style="list-style-type: none">• shallow• <u>medium</u>• deep	Soil type (one possible) <ul style="list-style-type: none">• clayey• <u>silty</u>• sandy / gravelly• rocky
Space availability (one possible) <ul style="list-style-type: none">• <u>large</u>• medium/large• medium• small/medium• small	Terrain / Topography / Slope (one possible) <ul style="list-style-type: none">• <u>flat</u>• slope	Anal cleansing method (more possible) <ul style="list-style-type: none">• water• <u>soft paper</u>• hard or bulky
Flood prone (one possible) <ul style="list-style-type: none">• not affected• frequent (low-lying area)	Vehicular accessibility (one possible) <ul style="list-style-type: none">• no access• limited / narrow access• <u>full access</u>	

Selected technologies



Links to Akvopedia articles

- Pour flush toilet:
http://www.akvo.org/wiki/index.php/Pour_Flush_Toilet
- Septic Tank:
http://www.akvo.org/wiki/index.php/Septic_Tank
- Motorized emptying and transport:
http://www.akvo.org/wiki/index.php/Motorized_Emptying_and_Transport
- Planted Drying Beds:
http://www.akvo.org/wiki/index.php/Planted_Drying_Beds

Short descriptions

Pour flush toilet



A Pour Flush Toilet is like a regular Flush Toilet except that instead of the water coming from the cistern above, it is poured in by the user. When the water supply is not continuous, any cistern Flush Toilet can become a Pour Flush Toilet. Just like a traditional Flush Toilet, there is a water seal that prevents odours and flies from coming back up the pipe.

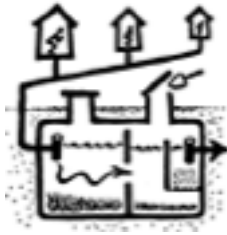
Relevant options

At option **Water supply (one possible)** you have selected **fetched / hand-pump / standpipe / tanker**. This means that in your situation, Pour flush toilet might be a suitable technology. This depends on: **Requires a considerable amount of water**

At option **Anal cleansing method (more possible)** you have selected **soft paper**. This means that in your situation, Pour flush toilet might be a suitable technology. This depends on: **Potential clogging of the water seal. A waste bin can be provided for disposal**

Septic Tank

A Septic Tank is a watertight chamber made of concrete, fibreglass, PVC or plastic, for the storage and treatment of blackwater and greywater. Settling and anaerobic processes reduce solids and organics, but the treatment is only moderate. A Septic Tank should typically have at least two chambers. The first chamber should be at least 50% of the total length and when there are only two chambers, it should be 2/3 of the total length. Most of the solids settle out in the first chamber. The baffle, or the separation between the chambers, is to prevent scum and solids from escaping with the effluent. A T-shaped outlet pipe will further reduce the scum and solids that are discharged. Liquid flows into the tank and heavy particles sink to the bottom, while scum (oil and fat) floats to the top. With time, the solids that settle to the bottom are degraded anaerobically. However, the rate of accumulation is faster than the rate of decomposition, and the accumulated sludge must be removed at some point. Generally, Septic Tanks should be emptied every 2 to 5 years,



although they should be checked yearly to ensure proper functioning. The design of a Septic Tank depends on the number of users, the amount of water used per capita, the average annual temperature, the pumping frequency and the characteristics of the wastewater. The retention time should be designed for 48 hours to achieve moderate treatment.

Relevant options

At option **Water supply (one possible)** you have selected **fetches / hand-pump / standpipe / tanker**. This means that in your situation, Septic Tank might be a suitable technology. This depends on: **Requires a considerable amount of water**

At option **Flood prone (one possible)** you have selected **not frequent**. This means that in your situation, Septic Tank might be a suitable technology. This depends on: **Not recommended in potential flooding areas and high groundwater level. Possible above ground.**

Motorized emptying and transport



Motorized Emptying and Transport refers to a vacuum truck or another vehicle equipped with a motorized pump and a storage tank for emptying and transporting faecal sludge, septage and urine. Humans are required to operate the pump and manoeuvre the hose, but they do not lift or transport the sludge.

Relevant options

Planted Drying Beds

A Planted Drying Bed is similar to an Unplanted Drying Bed with the benefit of increased transpiration. The key feature is that the filters do not need to be desludged after each feeding/drying cycle. Fresh sludge can be applied directly onto the previous layer; it is the plants and their root systems that maintain the porosity of the filter. This technology has the benefit of dewatering as well as stabilizing the sludge. Also, the roots of the plants create pathways through the thickening sludge to allow water to escape more easily. The appearance of the bed is similar to a Vertical Flow Constructed Wetland. The beds are filled with sand and gravel to support the vegetation. Instead of effluent, sludge is applied to the surface and the filtrate flows down through the subsurface to collect in drains. A general design for layering the bed is: (1) 250mm of coarse gravel (grain diameter of 20mm); (2) 250mm of fine gravel (grain diameter of 5 mm); and (3) 100–150mm of sand. Free space (1m) should be left above the top of the sand layer to account for about 3 to 5 years of accumulation. When the bed is constructed, the plants should be planted evenly and allowed to establish themselves before the sludge is applied. *Echinochloa pyramidalis*, Cattails or *Phragmites* are suitable plants depending on the climate. Sludge should be applied in layers between 75 to 100mm and should be reapplied every 3 to 7 days depending on the sludge characteristics, the environment and operating constraints. Sludge application rates of up to 250kg/m²/year have been reported. The sludge can be removed after 2 to 3 years (although the degree of hygienization



will vary with climate) and used for agriculture.

Relevant options
