#### APPROPRIATE URBAN SANITATION SOLUTIONS

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#### Introduction

We all want to live in a clean and healthy city. It is possible when also slum and low-income communities achieve safely managed sanitation.

This booklet proposes a range of sanitation options that can fit with the reality in your community; taking into account economic capacity of the families to invest and maintain it clean and functional, density and availability of space at households and within the community, and current emptying services or sewerage networks in the city.



#### Take into account

Before selecting an option, we should see the pros and cons of different sanitation technologies and think which one will be the most suitable for our community. At least, we should think about:

- 1. Financial: Do the users have willingness and ability to pay for construction and maintenance? Think about cost of building materials and labour costs; cost to maintain it clean and regularly empty the containment; water costs for flushing the toilet; cost to repair it if damaged.
- 2. Technical: Do we have space in the households or some area in the community for bigger facilities underground? Think about land and space availability; number of users; available materials; operation requirements; existing drainage or sewer network.
- 3. Health: Will it be safe? Where will wastewater or drainage water go, and will people or children get exposed to these?



- 4. Environment: Will it be environment-friendly? Think about type of soil, water level, flood level.
- 5. Social: Is community unite or having good relationship to think about communal solutions which are most cost-effective? Take into account existing community based organisation, relationship with neighbours, acceptance of the solutions.
- **6. Institutional:** Which regulations and services are in place in the city? Take into account if there is laws and by-law that ban and punish illegal connections to drains; technologies and designing norms applying in the city and national level. What institutional support is available to help with management of any new facilities?





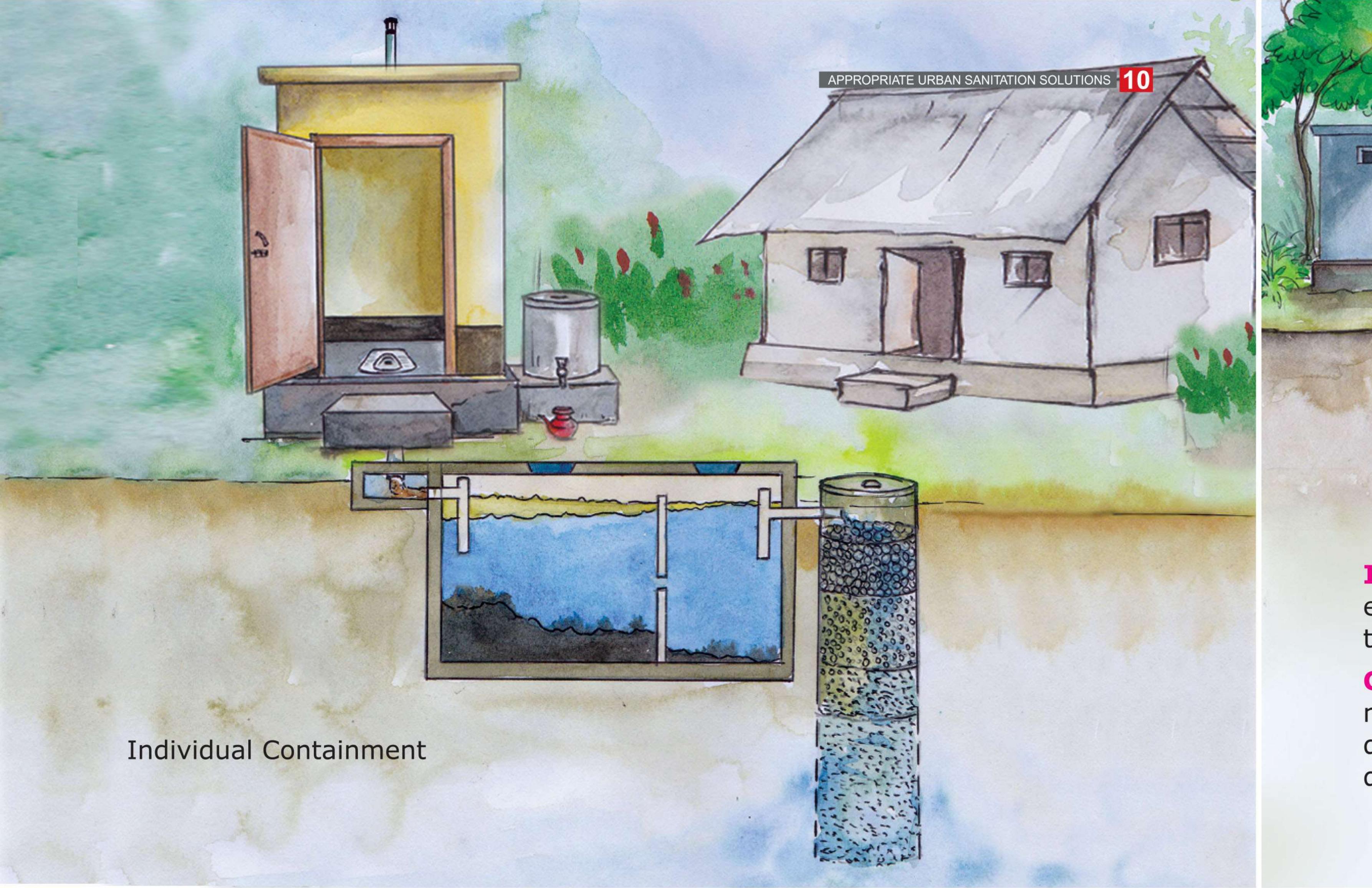
#### Toilets

Toilets can be built for one household, shared with several families or at communal level, depending on how many people can access the toilet

Household toilet: Individual toilet for one family. This is the preferred option, because it enables the country to achieve Sustainable Development Goals (SDG).

**Shared toilet:** A toilet shared by up to 20 people or by 2 – 3 families living close to one another.

Community toilet: Toilet blocks that are used by four or more households. This requires a functioning committee to manage the maintenance costs to clean, repair and empty the tank.





**Individual Containment:** Each household toilet have one containment, for example a pit latrine or a septic tank. The land availability will be determinant of this option.

Communal Solutions: Several household toilets are connected through a network that ends to a communal containment. This can be a big septic tank for different households built in the underground of the street or open space, or a decentralised wastewater treatment system (DEWATS).



#### Pit Latrine

A pit latrine is a hole in the ground using usually concrete rings.

It can be just under the toilet (Direct), next to the toilet (Offset), which is safer, or combined pits (Twin pit).

#### Advantage

It is low cost, few amount of land, easy to build, repair and operate by local masons.

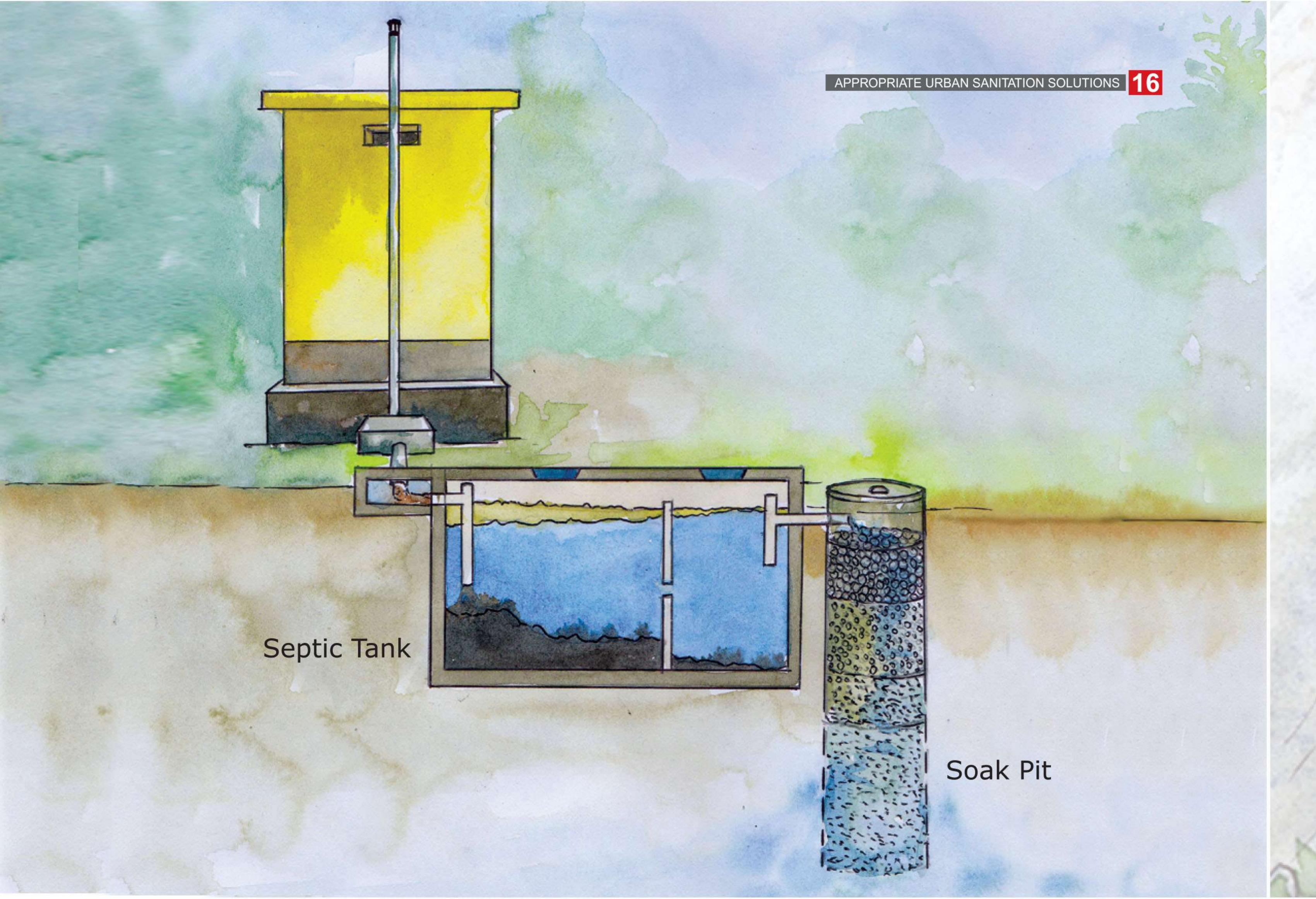


#### Disadvantages of Pit Latrine

If water table is nearby, it can pollute ground water and water wells in the community.

It is more difficult to empty, and when flooding it easily can overflow causing health problems in the community.

It is challenge to hold quality with low budget, sometimes it is cause of environment pollution due to broken within shorttime



## Septic Tank

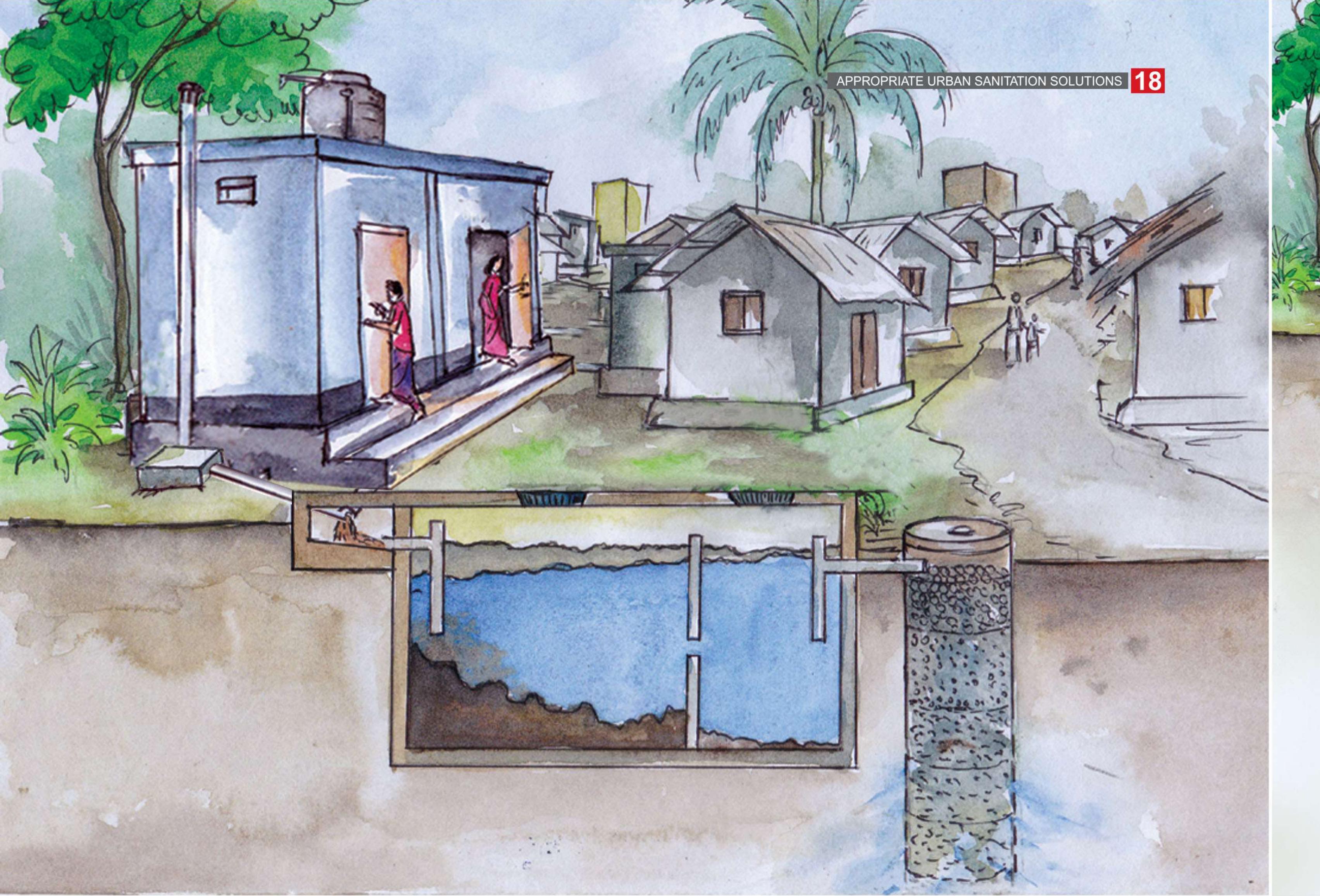
A Septic Tank is a safe containment made of concrete by mason or of plastic (HDPE), that carry a first treatment to faecal sludge. It should comes connected to a Soak Pit that discharge safely water to environment. If there is no Soak Pit, then the effluent water should not be discharged directly to open drains and must be treated further as it is not safe.

#### Advantage

It ensures safely managed sanitation. It is safer for users and easy to empty by a Vacutug service.

#### Disadvantages

It is costly for only one household. If it is not regularly emptied, the system will not function properly. If groundwater is shallow, the effluent water can pollute the groundwater



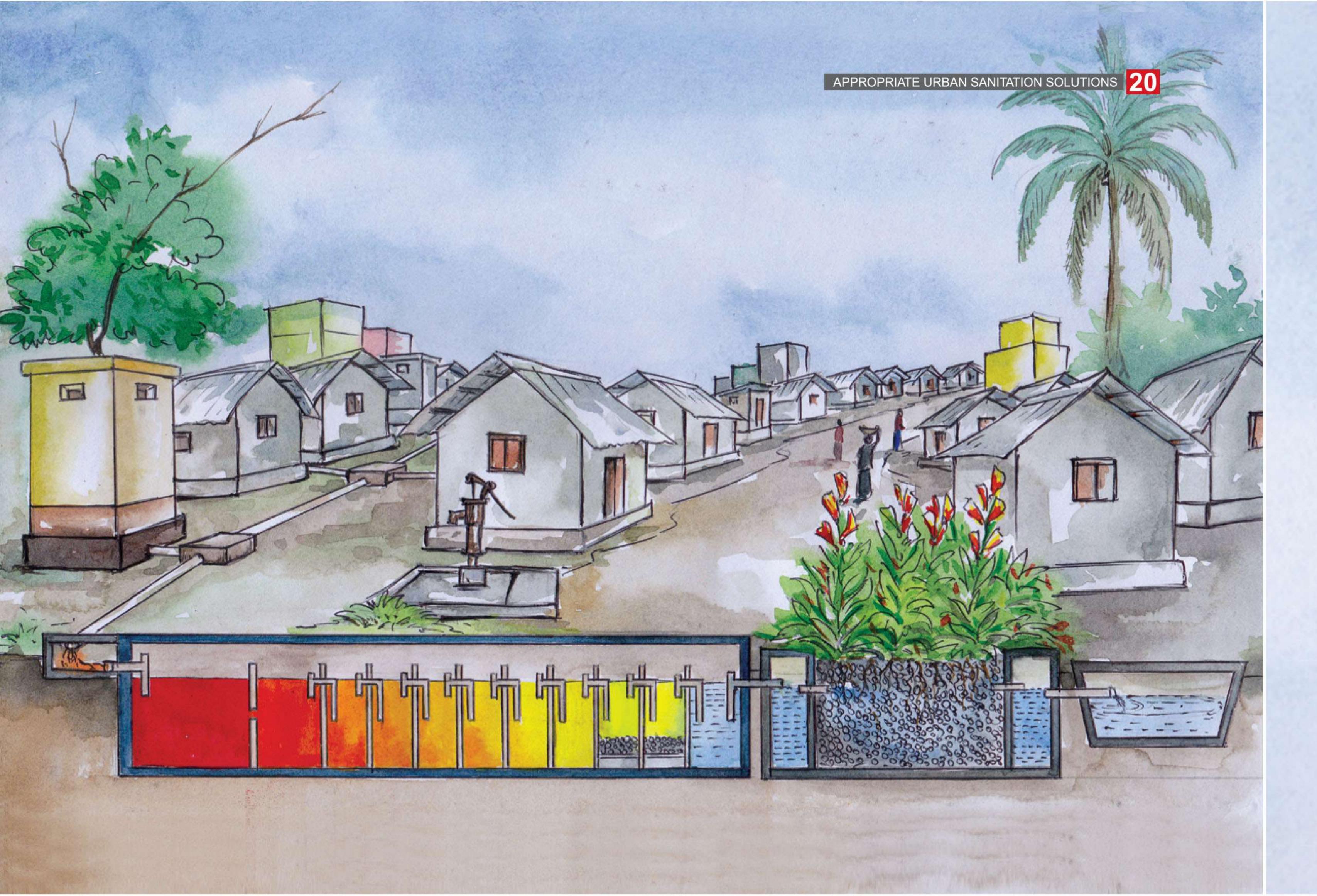


#### Advantage

It is cheaper because construction and maintenance costs are shared with other households.

#### Disadvantage

It requires a common land in the community to build it (though sometimes it can be built under roads), and a community management committee to provide regular maintenance.



# **Decentalized Wastewater Treatment System**(DEWATS)

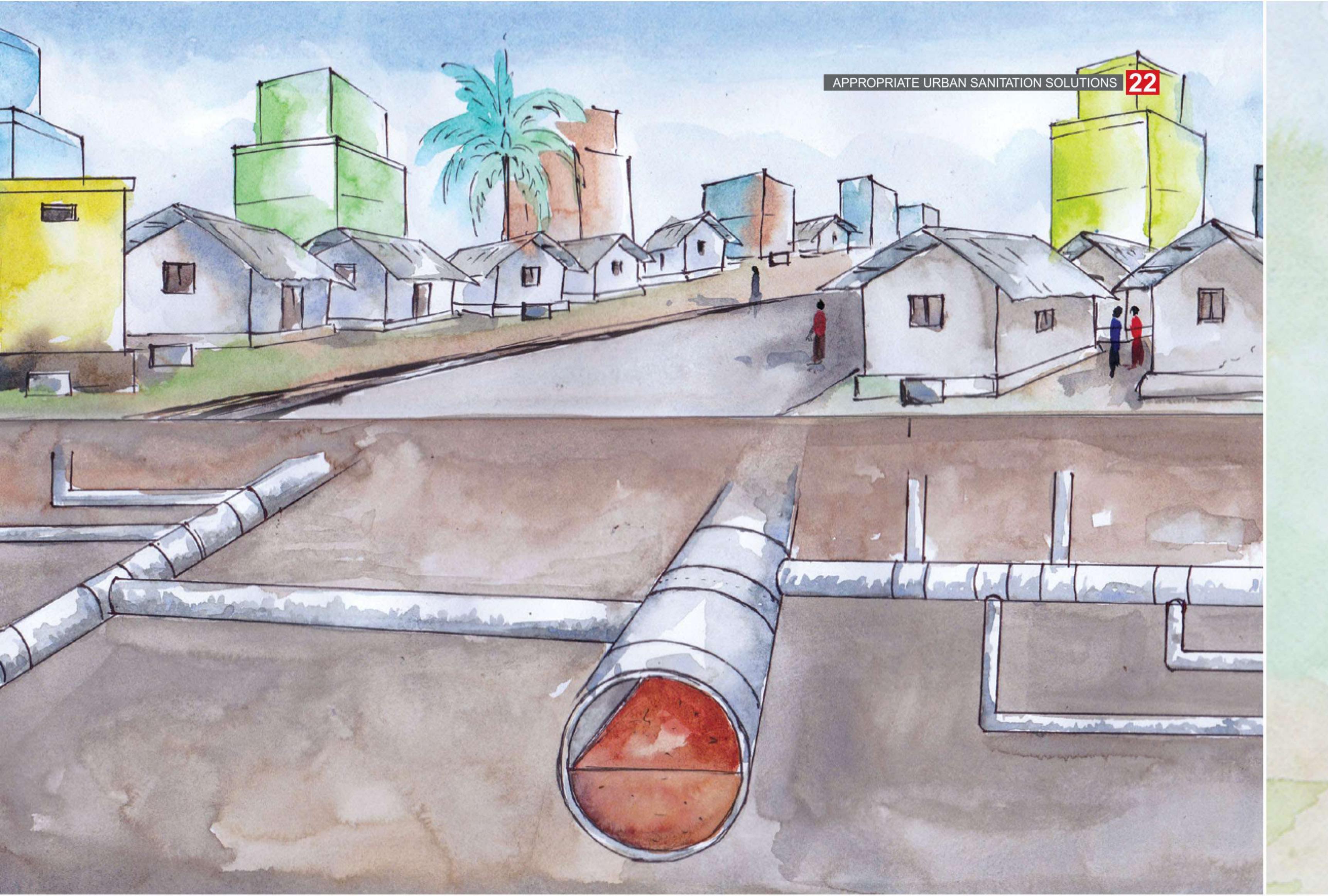
DEWATS are small treatment systems with a combination of chambers that settles and filter the sludge and ensure safe water to environment. Toilets are connected through a simplified sewer network to the system.

#### Advantage

It is even cheaper because construction and maintenance costs are shared with several households, from 20 to more than 100. It can be adapted and installed under roads and pathways in high dense areas.

#### Disadvantage

It requires a community management committee to provide regular maintenance.



### Simplified Sewer

Simplified sewer is a network that connects several households' toilets using reduced sewerage standards. Like reduced pipes, smaller inspection chambers and crossing backyards or households premises. The network can ends in a communal septic tank, a DEWATS or a conventional sewerage system.

#### Advantage

It is a cheaper solution to take out faecal sludge from a high dense area. Especially when even Vacutugs can't access. The network can be installed in narrow roads and high dense areas.

#### Disadvantage

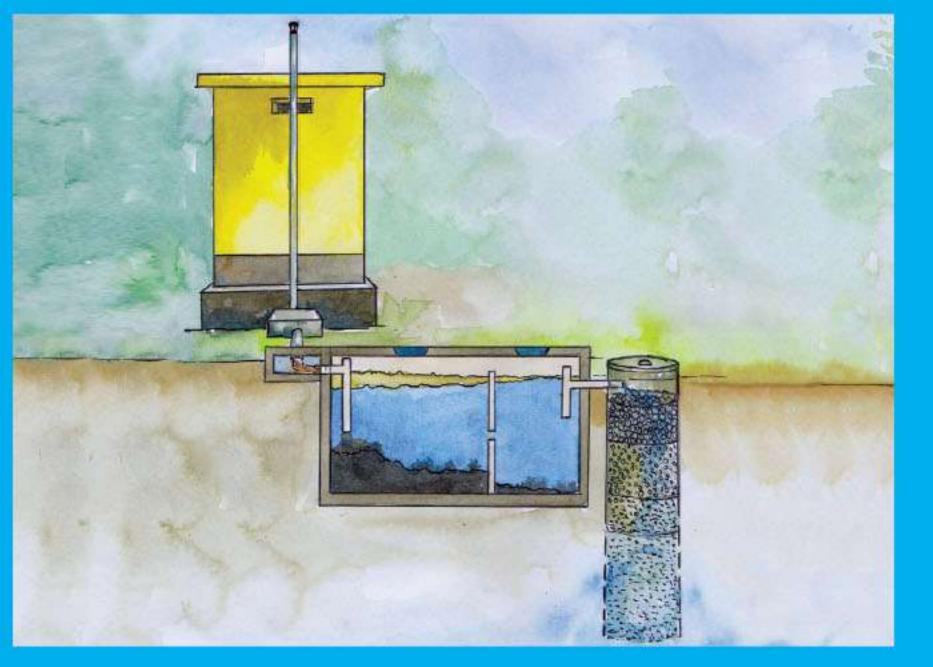
It requires good solid waste management from the households, because any solid can clog the network.

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# Which is the most appropriat solution for your community or household?



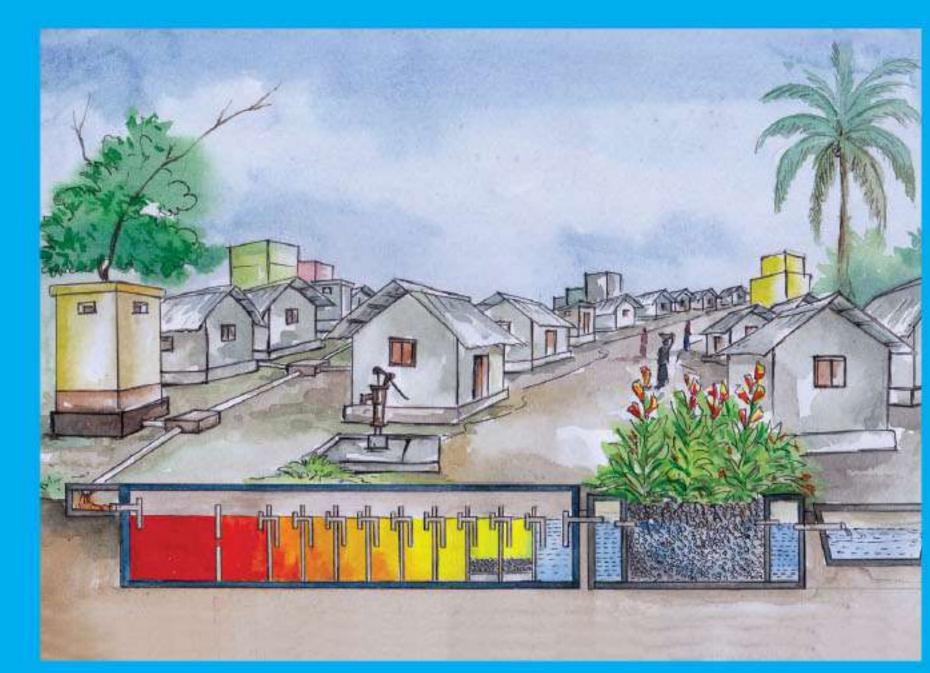




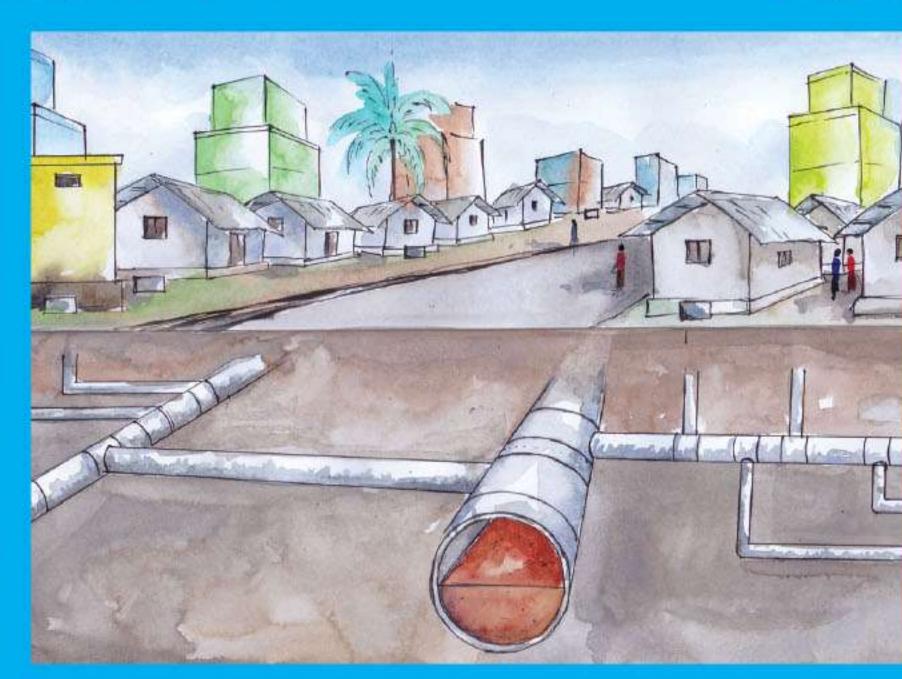
Pit Latrine

Communal Septic Tank

Septic Tank







Simplfied Sewer