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Understanding a Biofiltration Soakaway System

A Cleaner, More Sustainable Wastewater Solution

At Viges, we believe in building wastewater systems that are not only effective but also environmentally responsible. One method we often recommend is a **biofiltration soakaway**, which uses natural materials such as **charcoal** and **coconut husks** to improve the quality of wastewater before it enters the surrounding soil.

Think of it as **a natural water filter buried underground.**

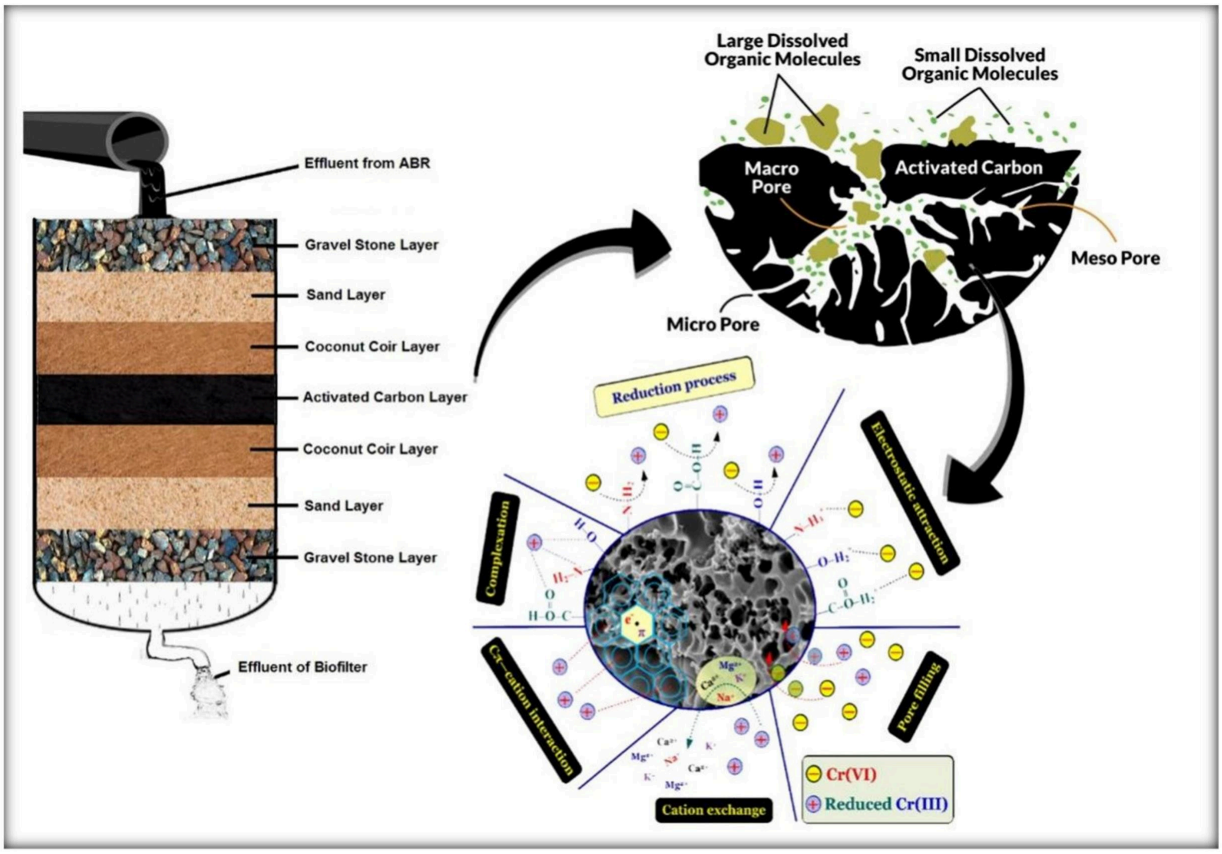
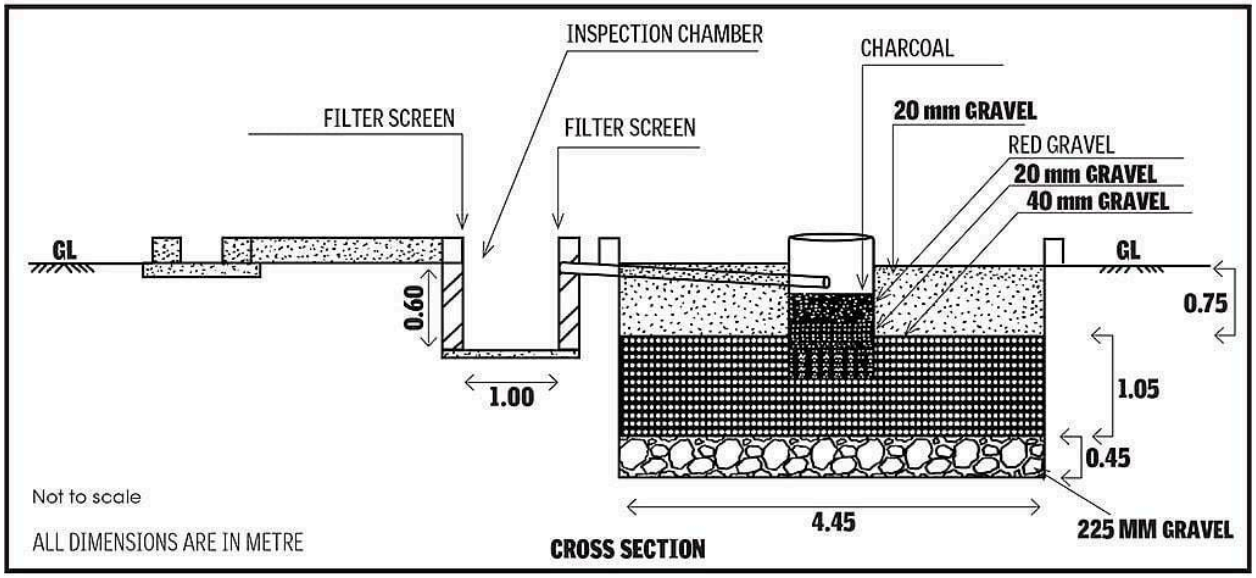
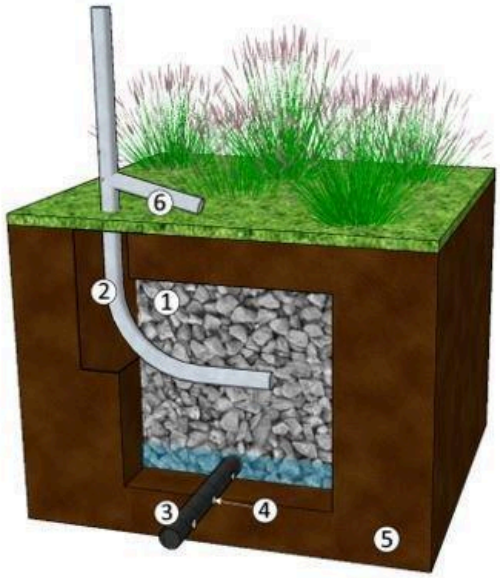


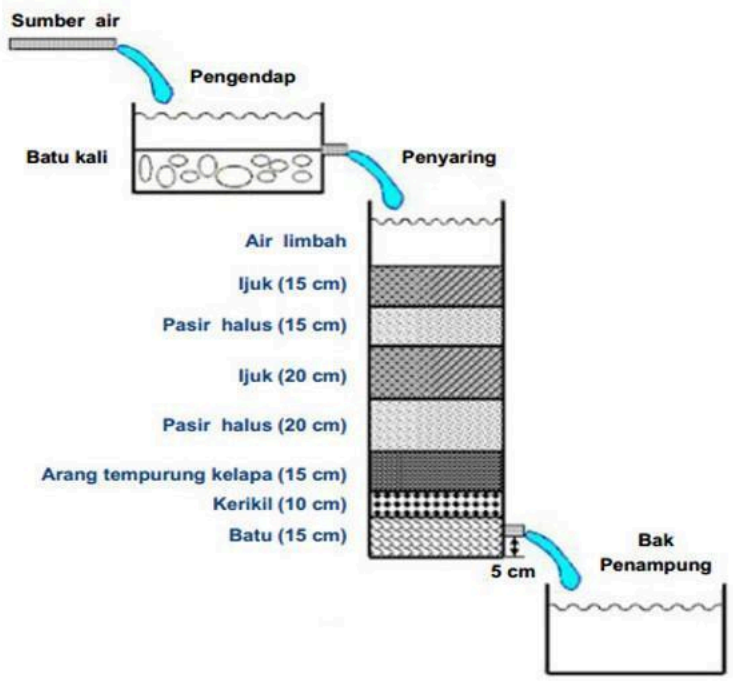
Figure 10: Cross section of vertical soak pit



Source: DRDA (District Rural Development Agency), Ramanathapuram district, Tamil Nadu



1. Storage Layer
2. Inflow Pipe
3. Underdrain
4. Perforation
5. Native Soil
6. Overflow



How Does It Work?

Instead of allowing wastewater from a septic tank to flow directly into a standard soakaway pit, the water passes through several natural filtering layers.

Each layer has a specific purpose:

1. Gravel Layer

The bottom and sides of the soakaway are filled with coarse gravel.

Purpose

- Allows water to spread evenly
- Prevents soil from clogging the system
- Creates storage space for water before it infiltrates the ground

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2. Charcoal Layer

A layer of crushed hardwood charcoal is placed above or between the gravel.

Purpose

- Absorbs odors
- Traps some organic compounds
- Helps reduce discoloration in wastewater
- Creates a healthier environment for beneficial bacteria

Charcoal acts much like the activated carbon filters used in drinking water systems, although untreated charcoal is less refined.

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3. Coconut Husk Layer

Natural coconut husks or coconut fiber are placed above the charcoal.

Purpose

- Filters suspended particles
- Slows the movement of wastewater
- Provides a habitat for beneficial microorganisms
- Begins the natural breakdown of organic matter

As wastewater passes through the fibers, naturally occurring bacteria continue to digest remaining waste.

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4. Natural Soil Filtration

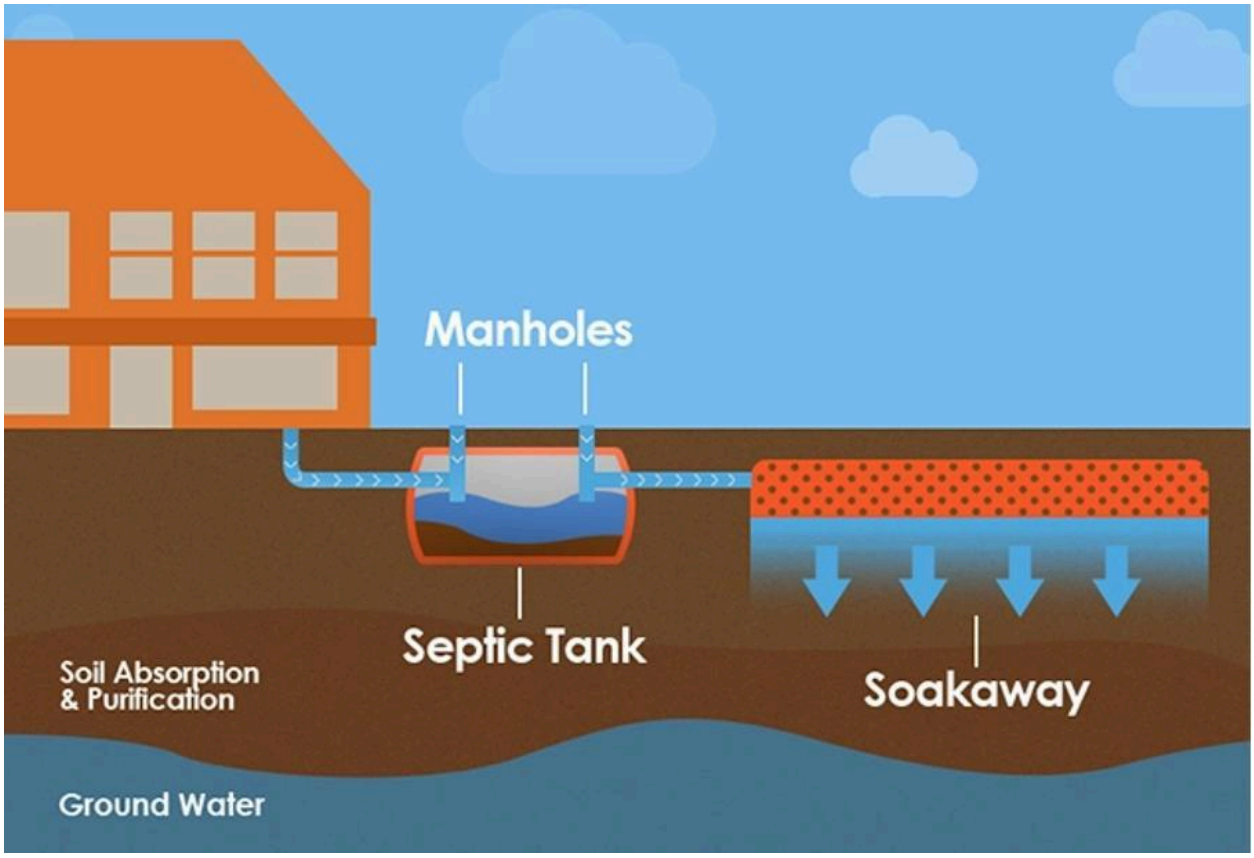
Once the water has passed through the biofilter layers, it slowly enters the surrounding soil.

Purpose

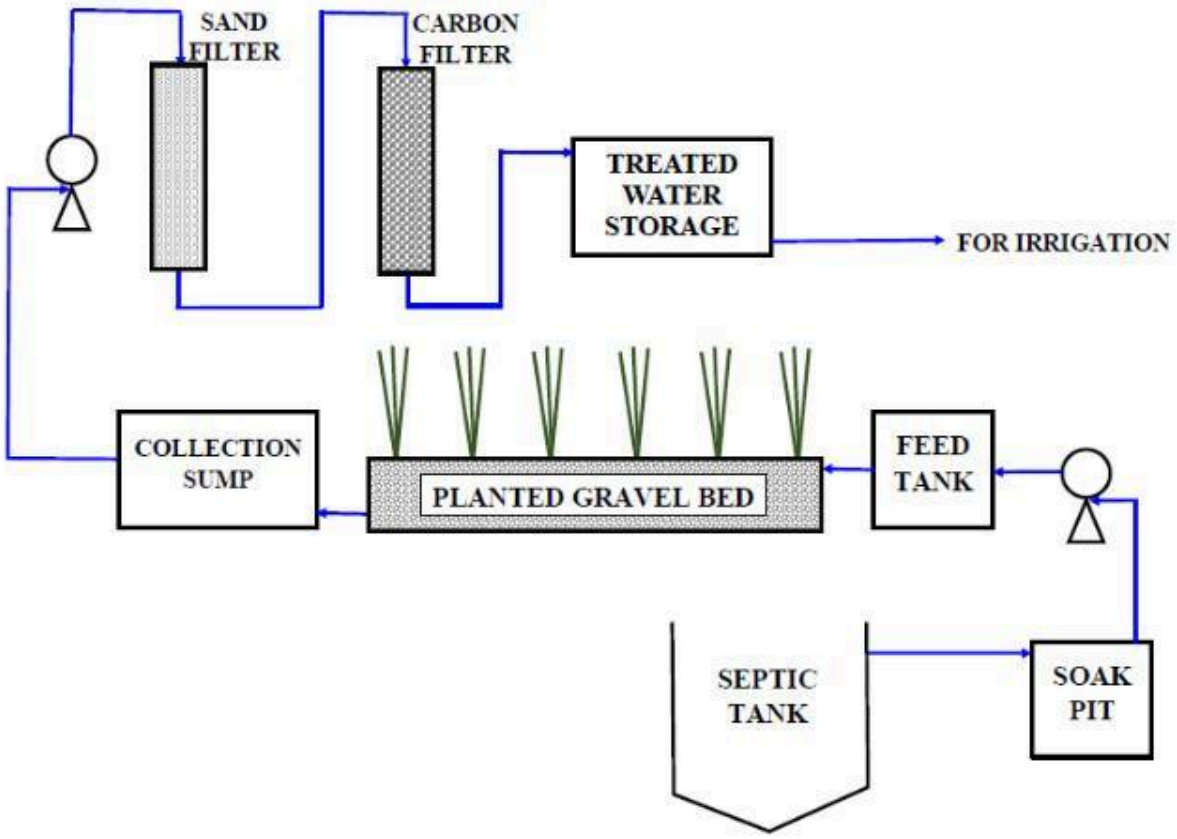
- Final polishing of the water
- Additional removal of nutrients and microorganisms
- Safe infiltration into the ground

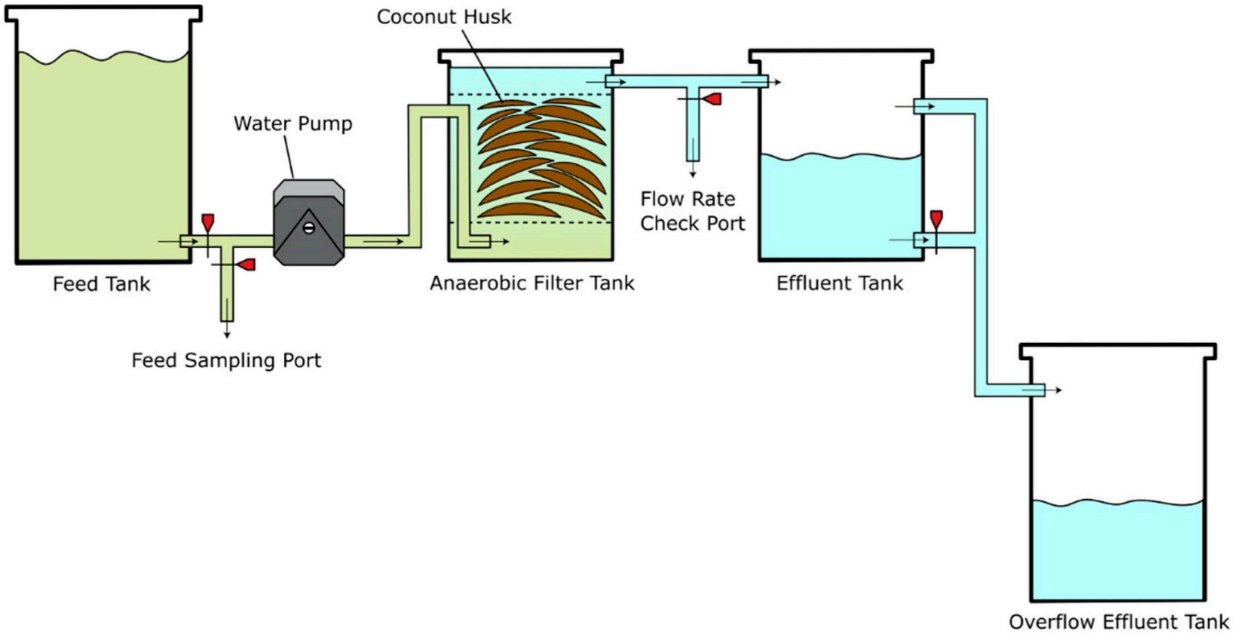
Healthy soil contains billions of beneficial microbes that continue the treatment process naturally.

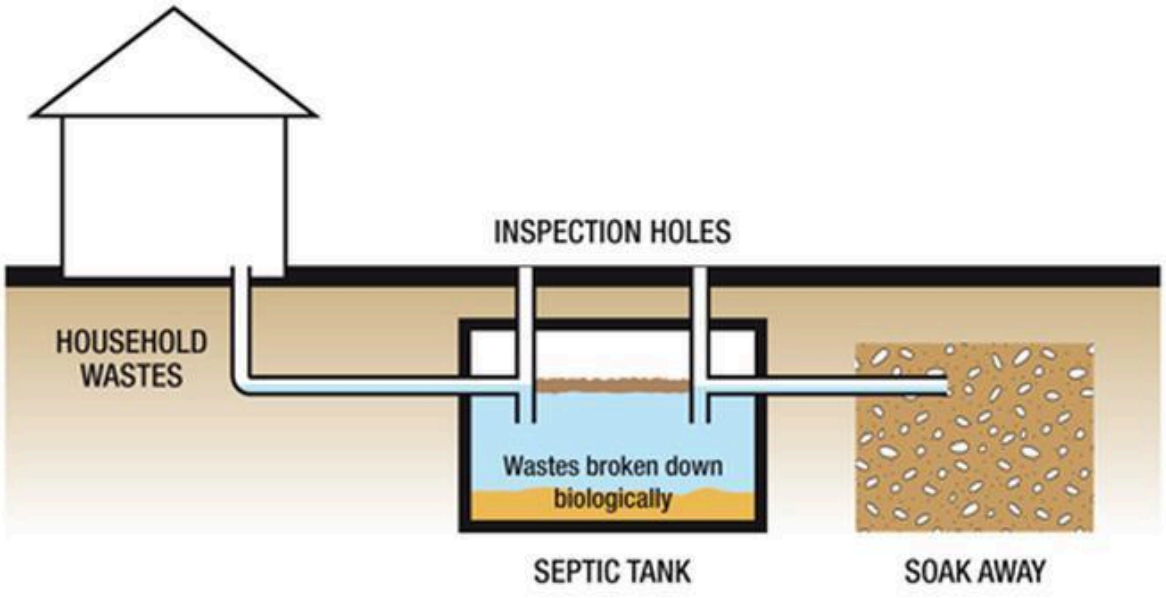
Simple Flow of the System



PROCESS DIAGRAM OF WASTEWATER TREATMENT PLANT







House
↓
Septic Tank
↓
Gravel Layer
↓
Charcoal Layer
↓
Coconut Husk Layer
↓
Natural Soil

Benefits of a Biofiltration Soakaway

✔ Helps reduce unpleasant odors

✔ Improves the quality of wastewater entering the ground

✔ Encourages natural biological treatment

✔ Uses sustainable, locally available materials

✔ Can extend the lifespan of the soakaway by reducing clogging

✔ More environmentally friendly than a basic soakaway alone

Important to Know

While a biofiltration soakaway provides an **extra level of treatment**, it **does not replace a properly designed septic tank**. The septic tank remains the primary treatment system, separating solids from liquids before the wastewater reaches the soakaway.

The biofiltration layers simply improve the final stage of treatment before the water is absorbed into the soil.

Is This System Right for Every Property?

Not always. The effectiveness of a biofiltration soakaway depends on factors such as:

- Soil type
- Groundwater level
- Available land area
- Household wastewater volume
- Local environmental conditions

A site assessment should always be completed before installation to ensure the system is appropriate and complies with local requirements.
