Biosand Filter

A water treatment system that removes pathogens and suspended solids from water using biological and physical processes that take place over a sand column covered with a biofilm.
What is it made of?

- Diffuser - Protects the top of the sand and the biolayer from being damaged when water is poured into the filter.
- Biolayer - A community of micro-organisms that live in the top 1-2 cm of the sand. The micro-organisms eat some pathogens in the water, helping the filter treat the water better.
- Filtration Sand - Removes pathogens and suspended solids from water. The filtration sand is specially selected and prepared to treat the water well.
- Separation Gravel - Supports the filtration sand and prevents it going into the drainage gravel and outlet tube.
- Drainage Gravel - Supports the separation gravel and prevents it going into the outlet tube.

Lid - A tightly fitting lid prevents contamination and pests in the filter.
Outlet Tube - After the water flows down through the sand and gravel, it collects in the tube below the bottom of the filter. Gravity pushes the water up the tube, and it flows out the end of the tube on the outside of the filter.
Safe Water Storage - A water container with a lid and a tap protects the water from being contaminated again.

Effectiveness

BSF removes:
- 100% helminths
- 100% protozoa
- 98.5% bacteria
- 70%-99% viruses
- 95% turbidity
- 95% iron

Water needs other treatment methods in order to become safe-drinking type.

Costs

- $12-$30
- Minimal maintenance

Chlorine, Solar disinfection, Boiling
Disadvantages of bio-sand filter

- Bio layer takes 20-30 days to develop
- High turbidity will clog filter
- Must be used on a regular basis
- Limited transportation due to weight

Community-sized vs. household filter

Biosand filters are designed to meet household needs.

A community-sized filter would be hard to clean.

A slow sand filter is a better suited alternative for a community filter or multiple BSF on the same location.
Slow Sand Filter

- Works well on a community-sized scale
- Includes more parts than a BSF
- Requires a steady flow of water and regular maintenance

Sources

https://www.cawst.org/services/expertise/biosand-filter/more-information
https://www.sswm.info/sswm-university-course/module-6-disaster-situations-planning-and-preparedness/further-resources-0/biosand-filter
https://www.sswm.info/sswm-university-course/module-6-disaster-situations-planning-and-preparedness/further-resources-0/slow-sand-filtration