



Conditions:

- ◆ 38 Rural Elementary Schools with no drinking water treatment.
- ◆ About 20 students, age 7 to 14 in each school.
- ◆ Untreated water from small streams is piped to each community, including the schools.
- ◆ Teachers boil the water before consumption.
- ◆ The water contains suspended solids and humics.

Project Goals:

- ◆ Identify low cost, robust, operator friendly ways of treating the water to meet drinking water standards.

Solution:

- ◆ Design and install slow sand filters at the Schools.
- ◆ Discover appropriate alternative technologies for water disinfection.

26

SLOW SAND FILTRATION

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WORLD HEALTH ORGANIZATION
GENEVA

1974

27

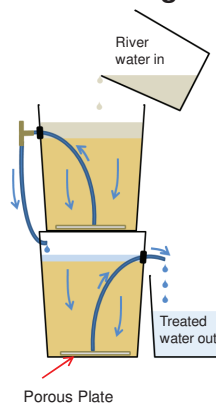
Existing Slow Sand Filter (SSF) Designs



28



Basic Design:



- Each "unit" consists of two 5-gallon plastic pails
- The sand is sieved to remove fine and coarse material
- The pore volume of one unit is greater than 10 L
- Generally, 10 L surface water can poured through a unit every 8 hrs (depending on the water quality)
- The 8 hour retention period allows time for microbial decay (i.e., mineralization) of the organic materials in the water
- 2 units can treat 60 L each day (design capacity)
- Sand and pails are obtained locally
- Porous plates, tubing and other fittings are easy to deliver

30

- 2011:**
- Constructed filters at 3 schools in Colombia (March)
 - Perform chemical and biological tests on filtered water in Colombia (June)

- 2012:**
- Teacher training on filter construction (provide filters to 15 additional schools)

- 2013:**
- Designed portable trommel
 - Redesigned porous plate

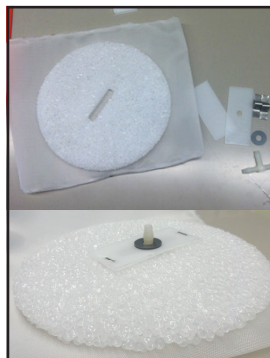
- 2014:**
- Provided filters to a school near Amaga Antioquia (w/ EPM Foundation)
 - Installed several filters in Tanzania and Kenya

- 2015: Visited**
- Provided Filter parts to a church group who installed filters in India
 - Installed drum filters in Tanzania and Kenya

- 2016:**
- Installed two drum filters in a school near Cartegana Colombia



31



Materials For each "unit"

- Porous Plates (2)
- Mesh Bags (2)
- Plastic Strips w/ hole (2)
- Plastic Strips w/o hole (2)
- Stainless Steel Strips (4)
- Staples (SS) (8)
- Tees (3)
- Washer (2)

Not shown:

- Tubing (15 inch x 3)
- Grommets (2)

Total materials cost
For one "unit"
(w/o sand and pails)
\$12

Purchased Locally:

- Sand
- Pails (2)

Note: If the filter becomes clogged, simple remove the sand, rinse it, and place it back in the pail (you cannot do this if there are gravel layers at the bottom).



Finished Filter in Xining China