

# BIO-SAND TECHNOLOGY ADOPTED IN INDIA FOR SUSTAINABLE WATER FILTERING

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Tested and approved by various governments and research centers, the Bio-sand technology has effectively been introduced in over 66 countries, one of them is India, where this low-cost technology is being used to solve the problem of the scarcity of clean water.

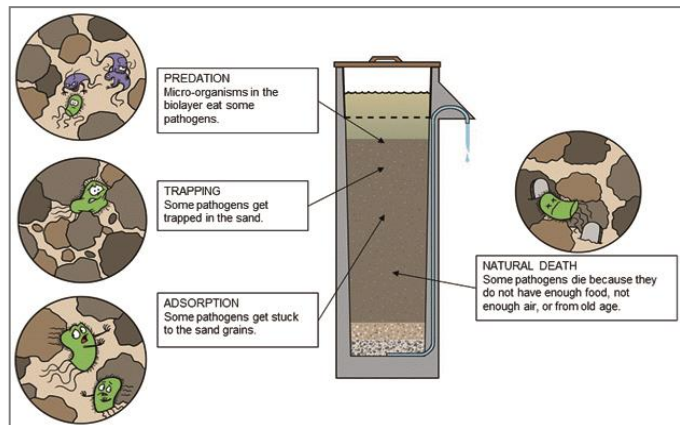
Scarcity of clean water is an impacting problem in India. Citizens, industry and farmers have been guzzling surface water; groundwater levels are reducing, the amount of pollutants in water is increasing rapidly and heavy metals exceed the national safety limits as well. Most villagers consume unsafe drinking water on a daily basis. Some families opt for boiling the water prior to drinking which can be costly. Those who can afford it, buy bottled water to reduce the risks of such diseases, while economically and financially weaker people continue to consume impure water, which eventually causes disease and death.

The Bio-sand filter costs in India about \$44 and works for 30 years. It is easy to maintain and filters 84 liters of water daily, enough for 10-12 people, or 70 schoolchildren. No chemicals, moving parts, exterior pipes or electrical apparatus are used. There is virtually no maintenance, no operating and no electricity costs.

The Bio-sand filter is made of locally available cement, sand and pebbles. It consists of various layers of sand and pebbles, and a 2-inch standing water layer known as the "bio-layer". The dirty water is poured on top, and meets with the bio-layer where bacterial predation occurs. Then the water moves through the filtration sand and, because of an electrostatic charge, viruses adhere to the fine sand and are trapped within. This is known as adsorption. Furthermore, because there's no food, no light, and no oxygen, further pathogen die-off takes place. The water then flows down into the pebbles and comes back up in an outlet tube, and is stored in a clean water container with a lid to protect it from re-contamination.

Many NGOs in India like [South Asia Pure Water Initiative](#) (SAPWII) and Dhan Foundation, are distributing bio-sand filters in 12,000 villages and have positively impacted more than 100,000 villagers. Michael B. Lipman, President of SAPWII, stated that their five-year goal is to place 15,000 filters into service in South India by 2016 and provide ongoing water and sanitation education.

The Bio-sand filter was designed by David Manz, a former professor at University of Calgary, Canada. Using his expertise in water engineering and wastewater treatment,



he developed a low cost Water Filter that effectively removes all the dissolved particles and pathogens from the water. This slow purifying process manages to remove up to 98% of bacteria, 100% of viruses, 99% of parasites, protozoa, amoebae, and worms, 95% of heavy metals, and with a slight modification, 93% of arsenic. It manages to eliminate illnesses such as Typhoid, Cholera, Hepatitis A, Rotavirus, E-coli bacteria, and other dysentery causing organisms.

[Technical information on Bio-sand filters](#) are available in the manual developed by CAWST (Centre for Affordable Water and Sanitation Technology).

David Manz has trained many organizations on how to design, construct, install, operate and maintain the Bio-sand filters. David Manz is also co-founder of CAWST, which in June 2009 estimated to have deployed more than 200,000 Bio-sand filters in over 70 countries worldwide. More technical information concerning the construction of Bio-sand filters are available [on the website of David Manz](#).

### To know more

[Bio-sand filter in indiawaterportal website](#)

[South Asia Pure Water Initiative in Facebook](#)

[Bio-sand filter](#)

[Bio-sand in thebetterindia website](#)

[Bio-sand in thealternative website](#)

[Bio-sand in sapwii website](#)

[Bio-sand in IDRC website](#)

<http://www.manzwaterinfo.ca/bsf/bsf1.html>

<http://www.manzwaterinfo.ca/bsf/bsf5.html>

[Manual on Bio-sand filter-Spanish](#)

<http://www.cawst.org/>

