

POLICY GUIDANCE MANUAL ON WASTEWATER MANAGEMENT

WITH A SPECIAL EMPHASIS ON
DECENTRALIZED WASTEWATER TREATMENT
SYSTEMS



UN HABITAT
FOR A BETTER URBAN FUTURE



AIT
Asian Institute of Technology

The following key assumptions are made for the financial analysis of EcoSan:

- The construction time for EcoSan toilets is less than one year.
- All costs and benefits are expressed in April 2007 prices.
- The generation of benefits are realised in the value of urine and faeces collected in the toilet as a cost-free replacement for chemical fertilisers.
- Financial analysis of an EcoSan toilet is carried out over a period of 20 years.
- The residual value of the civil structure of the toilet is assumed to be 60 percent of the initial cost in the 20th year.

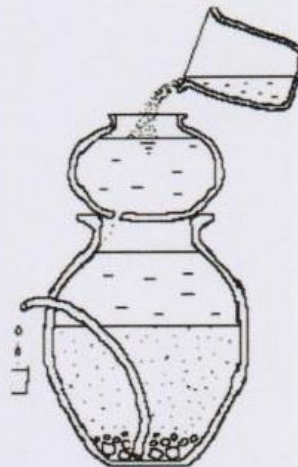
Case Study 6.4: Drinking Water through Household-Level Bio-Sand Filtration in Pakistan

The Nadi Water Filter is a unique solution to extract potable drinking water from contaminated water at the household level by using everyday objects such as clay pots and sand. This is accomplished by the utilisation of biological water treatment through microbes.

The advantages of this method lie in its relative simplicity as the filter is easily assembled, there is little or no cost of the materials involved, and its requires low maintenance. It basically involves filling up a clay pot with different sized rocks and sand that will provide the living environment for beneficial bacteria, which in return purify ingested wastewater that can then be used for drinking water after a few days. The only materials needed are a Nadi clay pot, Matka clay, sand, gravel of different mesh sizes, and a rubber tube.

One single filter may have tremendous implications for households:

- It may serve up to 30 people
- Helps families save USD 5 to USD 10 per month
- Save cost of travel and transportation
- Relieve women from fetching water from long distances



- ◆ Helps improve the health of women and children, thereby saving USD 10 to USD 20 per month
- ◆ Helps to save energy by using local materials (AHD, 2012)

Since 2007 the Association for Humanitarian Development (AHD) in Pakistan has installed more than 23,000 Nadi Filters and provided secured drinking water to 2,300 flood-affected families from 2010 to 2013. For its accomplishments, AHD won the Energy Globe Award 2014 (Energy Globe, 2014).

Policy Framework 6.1: Wastewater Methane Mitigation and Recovery Approaches

In the context of climate change, there are several approaches to wastewater methane mitigation and recovery. These are highlighted in the Table 6.

Table 6: Greenhouse gases mitigation and recovery approach

Recovery Approach	Description
Installation of anaerobic sludge digester (new construction or retrofit of existing aerobic treatment systems)	Many facilities in the developed world effectively use anaerobic digesters in tandem with an aerobic treatment to process wastewater bio-solids. This produces biogas that is used onsite to offset the use of conventional fuel that would otherwise be used for energy at the wastewater treatment facility. In addition to producing a "free fuel" that can be used to generate energy, anaerobic digesters can improve water quality, isolate and destroy disease-causing organisms that might pose a risk to human and animal health, and provide additional revenue streams, such as organic soil fertilizers that can be produced from digester effluents. The best way to realize the potential of anaerobic sludge digesters is either through the construction of new centralized aerobic facilities driven by increasing population growth and demand, or through the retrofitting of existing centralized aerobic treatment facilities.