

Improved point-of-use water treatment

Challenge: Water pollution

Adaptation response: Improved water treatment capacity

Description

Treating water at the point-of-use (such as the household) in places where centralized water treatment systems are not efficient or present can improve water quality and safety. Technological advances have resulted in a number of low-cost and effective point-of-use treatment options.

These include physical filtration (e.g. using cloths, ceramics, sand or specialized filters), chlorination or disinfectant powders (a chlorine solution or disinfectant added to water, killing most bacteria and viruses), solar disinfection (water bottled in clear plastic and placed under direct sunlight – ultraviolet rays and heat kill pathogens in still water) and boiling (heat inactivates dangerous bacteria and viruses).

Implementation

Criteria used to choose a specific treatment option, amongst others, include availability of local technology (and the required materials), current water quality and degree of contamination, cultural acceptance of technology, and intended final use. One or more treatment technologies can also be combined for more effective results, for example filtering first to get rid of larger physical particles, then adding disinfectant powders.

Education is vitally important when implementing these technologies to ensure proper treatment and health hazards are not created due to improper use. Training can include education on correct installation, dosages for disinfectants, treatment time and residual disposal (if relevant) to avoid environmental pollution. These activities may also be coupled with awareness raising on current water contamination levels, effects of using contaminated water, benefits of water treatment and available treatment technologies.

Environmental Benefits

- Uses renewable energy sources or does not require energy in most cases.

Socioeconomic Benefits

- Increases water quality, significantly decreasing the chances of contracting disease.
- Requires few resources and equipment, and is simple and relatively cheap, making local installation possible within a short period of time.

Opportunities and Barriers

Opportunities:

- Treatment options can provide significant health benefits in remote areas, where centralized water treatment is not be feasible
- Electricity or other costly energy sources are not required, increasing system resilience to events such as power shortages

Barriers:

- Certain treatments, especially chemical disinfectants, may lead to foul odours, taste and discoloration of the water, reducing consumer satisfaction (there are new treatments that are odourless and tasteless)
- Some treatment methods are time consuming and not suitable for large volumes, such as solar distillation, which can take up to two days
- May not be suited for all needs, for example highly contaminated water is difficult to clean and may not be potable even after treatment

Implementation considerations*

Technological maturity:	4-5
Initial investment:	1-3
Operational costs:	1-2
Implementation timeframe:	1-2

* This adaptation technology brief includes a general assessment of four dimensions relating to implementation of the technology. It represents an indicative assessment scale of 1-5 as follows:

Technological maturity: 1 - in early stages of research and development, to 5 – fully mature and widely used

Initial investment: 1 – very low cost, to 5 – very high cost investment needed to implement technology

Operational costs: 1 – very low/no cost, to 5 – very high costs of operation and maintenance

Implementation timeframe: 1 – very quick to implement and reach desired capacity, to 5 – significant time investments needed to establish and/or reach full capacity

This assessment is to be used as an indication only and is to be seen as relative to the other technologies included in this guide. More specific costs and timelines are to be identified as relevant for the specific technology and geography.

Climate Change Adaptation Technologies for Water

A practitioner's guide to adaptation technologies for increased water sector resilience

WATER ADAPTATION TECHNOLOGY BRIEF

UN Environment-DHI Centre
on Water and Environment



CTCN
CLIMATE TECHNOLOGY
CENTRE & NETWORK

UNEP DTU
PARTNERSHIP

Sources and further information

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