Technology Fact Sheet for Adaptation

Household Drinking Water Treatment and Safe Storage [i]

Household Drinking Water Treatment and Safe Storage

1. **Sector** – Water

2. **Technology characteristics**

2.1 Introduction

It is reported that in 2010, up to 88% of waterborne diseases in Sri Lanka were due to consumption of unsafe drinking water(1). Scarcity of water due to climate change can increase this problem. In 2007, 10% of the total population did not have access to safe water(2). In 2010, piped borne water coverage in Sri Lanka was around 39%(2). When safe water is not available, a safe drinking water supply should be provided. Household drinking water treatment is a possible solution for this problem. Incorporation of a chemical coagulation step for particle removal (flocculation) and a chlorination step for disinfection can be used for this purpose. Water purification sachets containing chemicals required for above purpose could be produced /imported and distributed for people who do not have access for safe drinking water. This technology contributes to adaptation for climate change by ensuring a supply of safe drinking water

2.2 Technology characteristics/Highlights

- Low-cost
- Simple technology

2.3 Institutional/ organisational requirements

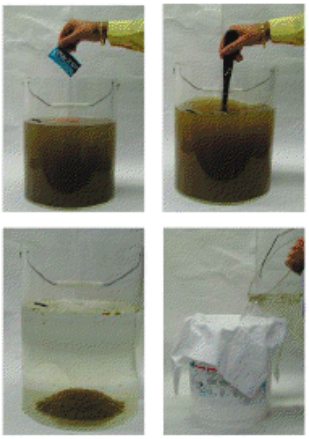
- Encourage relevant parties to produce water treatment sachets locally.
- Awareness programs and initial training required should be given by experts to households.
- Technical advice should be given whenever necessary by experts.
- Arrangements should be provided to test quality of purified water in a regular basis.

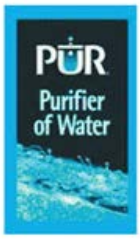
3. **Operations and maintenance**

3.1 Endorsement by experts

3.1.1 Operations

- Water purification sachets contain calcium hypochlorite for disinfection and a flocculant (e.g.ferrous sulphate) to precipitate dirt, parasites etc. and other impurities from water
- Water purification sachets will be provided to homes/schools etc. where safe drinking water supply is not available
- Contents in the sachets are added into 10L of water. Stir well for 5 minutes and then leave it for 5 minutes. If water is not clear, stir again until the flock is separated.
- Using a clean 100% cotton cloth or a suitable filter, filter it. Leave it for 20 minutes and then store in a container.
- If water is coloured should not use that water
- Water treatment sachets called Pu-R developed by Proctor & Gamble (P&G) in collaboration with the US Centers for Disease Control and Prevention (CDC)[2] are commercially available in certain countries.
- It is reported that, use of Pu–R have reduced diarrheal disease incidence by 16 % to more than 90 % in five randomized controlled health intervention studies[2].





3.1.2 Maintenance

- A clean cotton cloth should be used to separate the flock from water
- A clean container should be used to store purified water
- Quality of treated water should be tested

3.2 Adequacy for current climate

Negative consequences of the adaption option in the current climate:

- Salinity, nitrates, fluorides etc. are not removed by this method

3.3 Size of beneficiaries groups

19% of the total population, who does not have access for safe drinking water.

4.0 Costs

3.4 Cost to implement adaptation options

- The cost of a sachet is about 0.10 US $ + shipping charges
- Water quality testings (Rs. 5000/=)
- Expenditure for research on development of low cost purification sachets (Rs. 50000/=)
- Maintenance cost (Rs.200)

Additional costs to implement adaptation option, compared to "business as usual"

- May be cheaper if produced locally
- Expenses for water quality monitoring is required

4. Development impacts , indirect benefits

5.1 Economic benefits

- **Employment** – medium (Production of water treatment sachets)
- **Investment** - Low, Import/Production of water treatment sachets

5.2 Social benefits :

- Income
  - Medium
  - Income through employment (production of water treatment sachets)
  - Less expenditure on medical care
  - Easily transported (due to their small size, long shelf life, and classification as non-hazardous material for air shipment);
- Education
  - Awareness programs and initial training required should be given by experts.
  - Technical advice should be given whenever necessary by experts.
  - School education on this subject - medium
  - Research requirement – medium
- Health
  - High impact
  - This technology would decrease waterborne diseases due to supply of drinking water without pathogens.

- Removal or inactivation of viruses, bacteria, parasites, heavy metals, and pesticides

5.3 Environmental benefits

- Impact on ground water quality and quantity –No impact
- Impact on surface water quality and quantity – No impact
- Impact on flood forming – No impact
- Release of GHG – May release GHG during the production of required chemicals

6. Local context

6.1 (i) Opportunities

- When there are severe disasters, this technology can be used to purify water at household level
- In the midst of a waterborne disease outbreak
- Aesthetic improvement

(ii) Barriers

- During non crisis periods demand is low

6.2 Status

- This method was introduced in Ethiopia in 2007
- Certain people in Sri Lanka used this method after Tsunami

6.3 Acceptability to local stake holders

In areas where safe water is not available, this method could be implemented.

7. References

(1) SRI LANKA: Lack of safe drinking water leading to upsurge in health problems, Aug. 2010, http://reliefweb.int/node/365994

(2) Sri Lanka : Water Development Report:2010 ; K.A.U.S. Imbulana, N.T.S. Wijesekera, B.R.Neupane, M.M.M. Abeeyar and V.K. Nanayakkara, (ISBN 978-955-8395-02-8)

(3) Technologies for climate change adaptation-The water sector; Mark Elliot, Andrew Armstrong, Josep Lobuglio and Jamie Bartram, UNEP, (ISBN 978-87-550-3902-5); 2011 www.youthxchange.net/main/purwater.asp

[i] **This fact sheet has been extracted from TNA Report – Technology Needs Assessment Reports For Climate Change Adaptation – Sir Lanka. You can access the complete report from the TNA project website http://tech-action.org/**