Webinar #3
Surge Training: Emergency WASH

4 October 2022

Good webinar behaviour

- Please keep your microphone on mute and your video switched off
- If in need of technical assistance, please send a message to Jessie at +6019 779 9374
- The total length of the webinar will be 1 hour 15 mins (presentation, followed by Q&A session at the end)
- If you have any question, please raise it during the Q&A session at the end or post them in the chat box

Resource persons

Wendy Neoh is the Senior Officer, Emergency WASH based at the IFRC Asia Pacific Regional Office. She works closely with WASH and Health counterparts in Asia Pacific National Societies and IFRC delegations in the region. Her main responsibilities are to strengthen emergency WASH preparedness and response through technical and programme management support.

Before joining the IFRC in 2014, she was managing and implementing developmental WASH programmes in various Southeast Asia and South Asian countries, at a Malaysian-based NGO.

Jessie Lucien is the Health Programme Officer, who is providing technical support for the web platform and the webinar series, as well as managing administrative and financial matters, in relation to the surge training in Indonesia.

She has been providing support to the Health and WASH team in the IFRC Asia Pacific Regional Office since 2013.

Resource speakers

Ewinur Machdar (Ewi) is the COVID-19 Operations Coordinator in IFRC CCD Indonesia and Timor-Leste.

She has more than 18 years of work experience in INGOs and Red Cross Movement as a WASH delegate. She has been deployed in both emergency response and developmental programmes in various countries. Ewinur is member of IFRC surge roster and Australian RC delegate pool. She has co-facilitated various WASH trainings including ERU M20. Ewinur is joining us from Jakarta, Indonesia.

Wirakhman Somantri (Wira) is a WASH delegate with the Swedish Red Cross in Myanmar.

He is an environmental engineer who has worked with the ICRC and IFRC, both in emergency and developmental programmes, and under different settings such as rural areas, camps, detention centres and health facilities.

He is a member of the IFRC surge roster and is in the Swedish RC delegate pool. He has a particular interest in mainstreaming PGI and green response in WASH. Wira is joining us from Yangon, Myanmar.

Household water treatment and safe storage

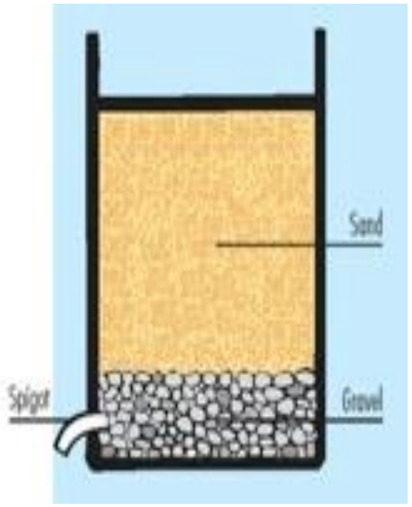
Surge training: Emergency WASH

Learning objectives

- What is household water treatment and safe storage (HHWT&SS)?
- What is a multi-barrier approach?
- What are the different methods of HHWT&SS?
- How and when to roll out a HHWT&SS programme?

What is HHWT&SS?

Household water treatment is any activity to improve water quality undertaken at the household level



Safe water storage is the use of clean containers with covers AND good hygiene behaviour that prevent contamination during water collection, transport and storage in the home

Pros and cons of HHWT&SS

Pros

- Relatively inexpensive
- Independent from institutional set-up or centralized systems
- Can be rapidly deployed and taken up by vulnerable populations
- Improves water quality and reduces contamination risk between water source and point of use
- Wide range of simple, low-cost technologies available

Cons

- High self-responsibility required from households
- Difficult to monitor the correct use and maintenance of the methods – could also be lead to a health risk
- Households have to be provided with knowledge on use and maintenance of technologies – could imply added cost and time
- Treated water may be lower quality than that offered by a well-designed, operated and maintained community system

HHWT&SS and Sphere

Water quality

- <10 CFU/100ml at point of delivery
- Turbidity less than 5 NTU
- ≥0.2–0.5mg/l free residual chlorine at point of delivery of delivery
- No negative effect on health
- Water treatment options used are effective in improving water quality, accompanied by appropriate training, promotion and monitoring
- All affected people drink water from a protected or treated source

Safe storage

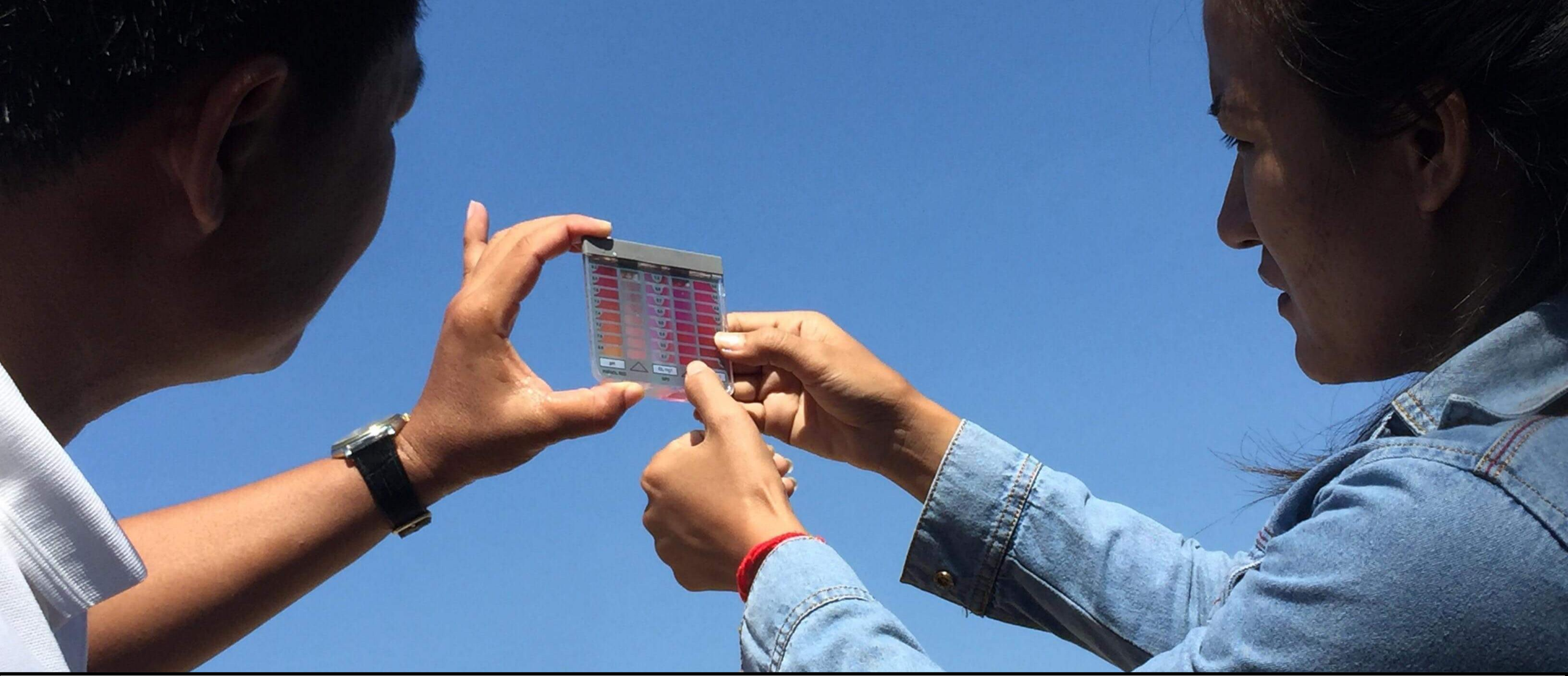
- 2 clean water collecting containers; 10–20 L/HH (for storage and transportation)
- Narrow necks and covers for storage
- Households need separate containers for collecting and storing drinking water

Important notes

- Use HWTSS when a centrally operated system is not possible
- Work with other sectors on household fuel requirements and access for boiling water
- Avoid introducing unfamiliar water treatment option in crises and in epidemics
- Effective use of HWTSS options requires:
  - Regular follow-up
  - Support
  - Monitoring

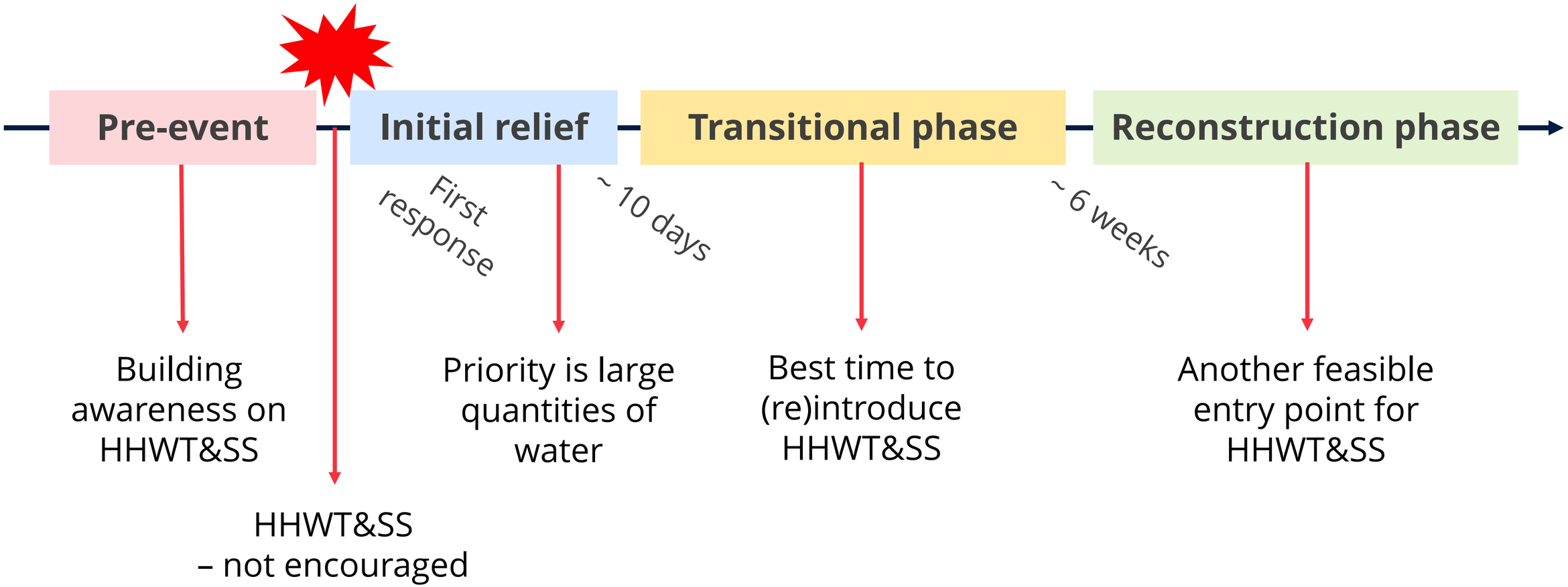
Source: Sphere handbook page 109-112

GOLDEN RULE #1: NO DISTRIBUTION WITHOUT TRAINING!



GOLDEN RULE #2: NO DISTRIBUTION WITHOUT MONITORING!

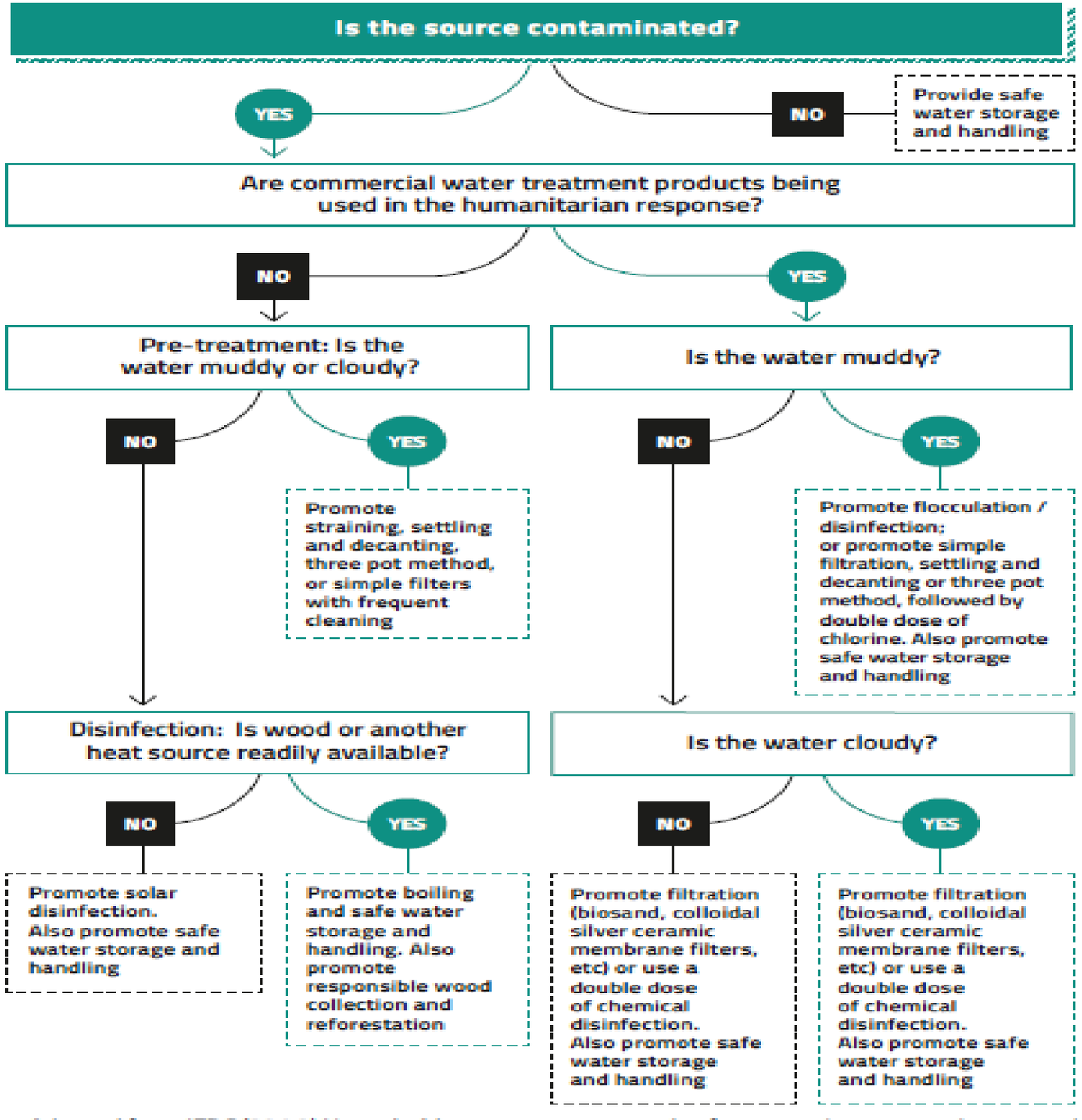
Rolling out HHWT&SS in the community



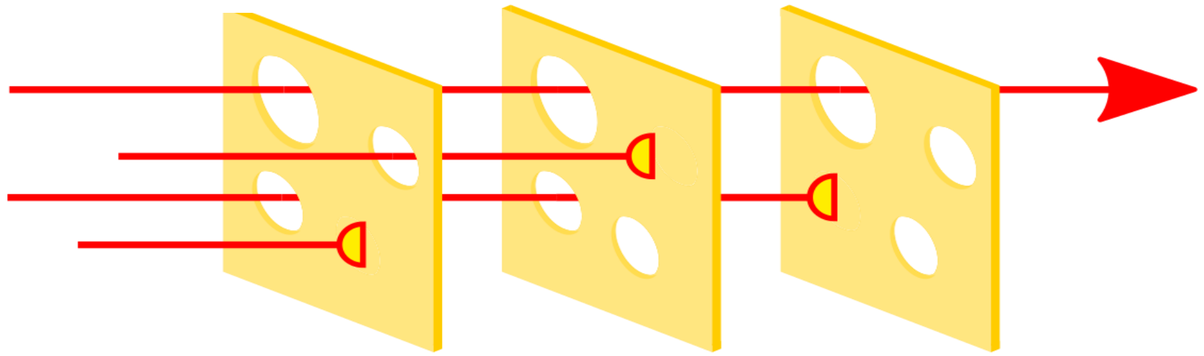
Source: RedR

HHWT&SS decision tree

- The Sphere Handbook has an appendix under the WASH technical chapter that gives guidance on deciding the route/steps in HHWT&SS – **“Household water treatment and storage decision tree”**.

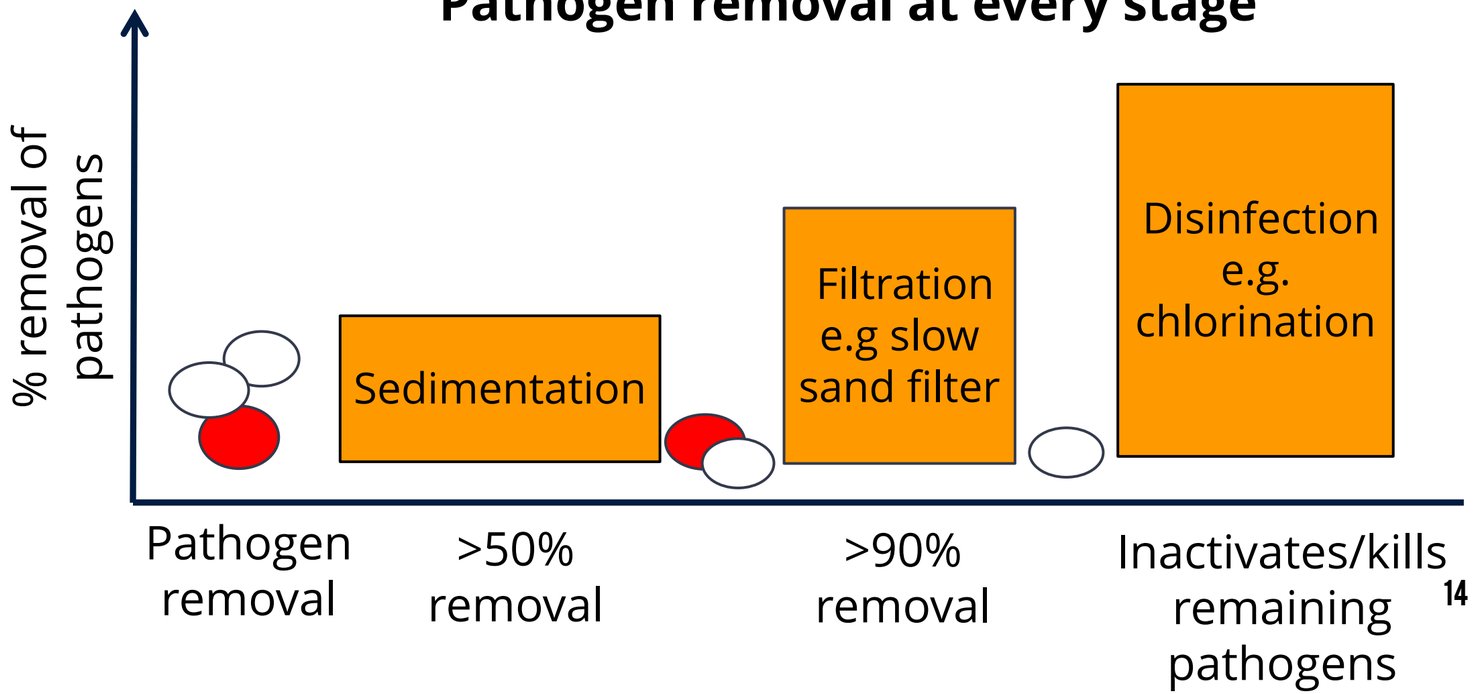


Multi-barrier approach



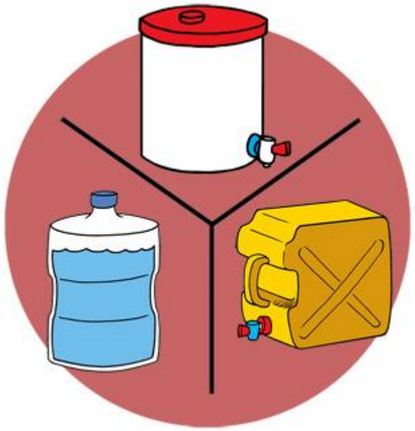
Swiss cheese model

Pathogen removal at every stage



Multi-barrier approach

- This approach is modeled after the multi-step process used by centralized water treatment systems
- Should be thought of as a system in its entirety, rather than giving focus to a single product/technology
- Each stage offers a “barrier” of protection against waterborne pathogens



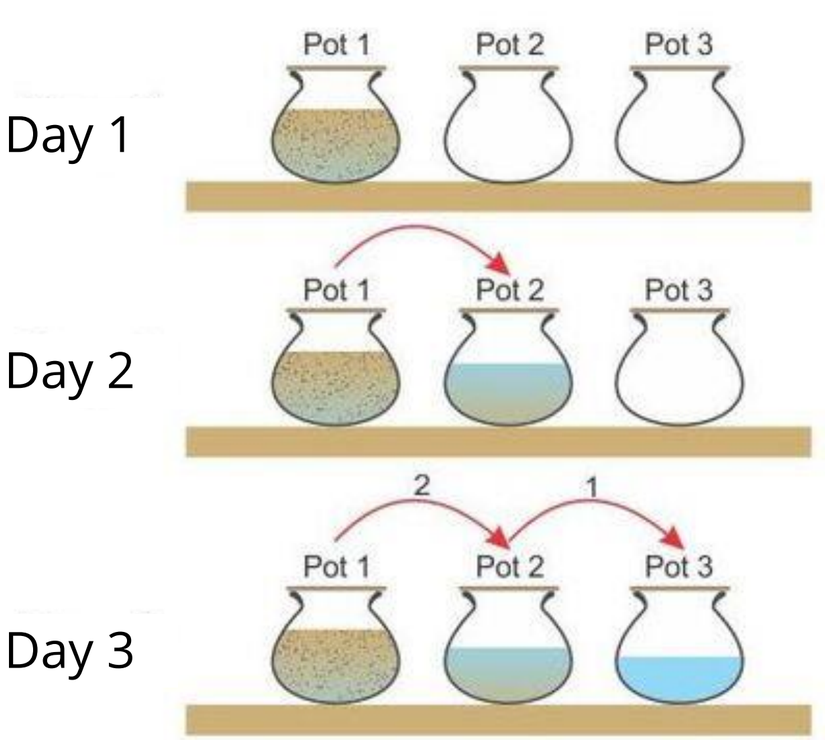
Source protection → **Sedimentation** → **Filtration** → **Disinfection** → **Safe storage**

Source: CAWST (2009)

Sedimentation

- Sedimentation is a physical treatment process allowing dirt to fall to the bottom of the water container over time or can also be achieved through the addition of chemicals
- Pathogens often attach themselves to large particles, therefore sedimentation can also remove some pathogens

Option 1: Settling using 3-pot method



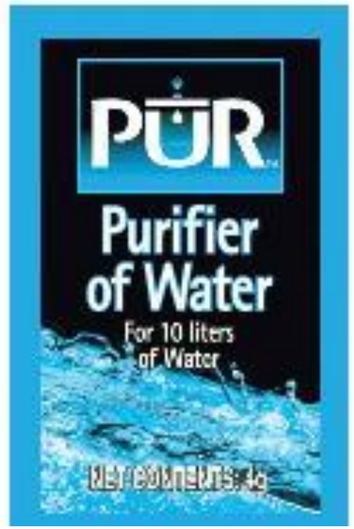
TIP

- Strain water using clean, fine cotton cloth
- Wash the cloth in between uses

Sedimentation

Option 2: Sedimentation (and disinfection) using chemical coagulants

- Watermaker/PuR sachets: coagulation + chlorination
- Alum (aluminium sulphate)
- Polyaluminium chloride – liquid alum
- Aluminium/iron salts i.e. ferric sulphate

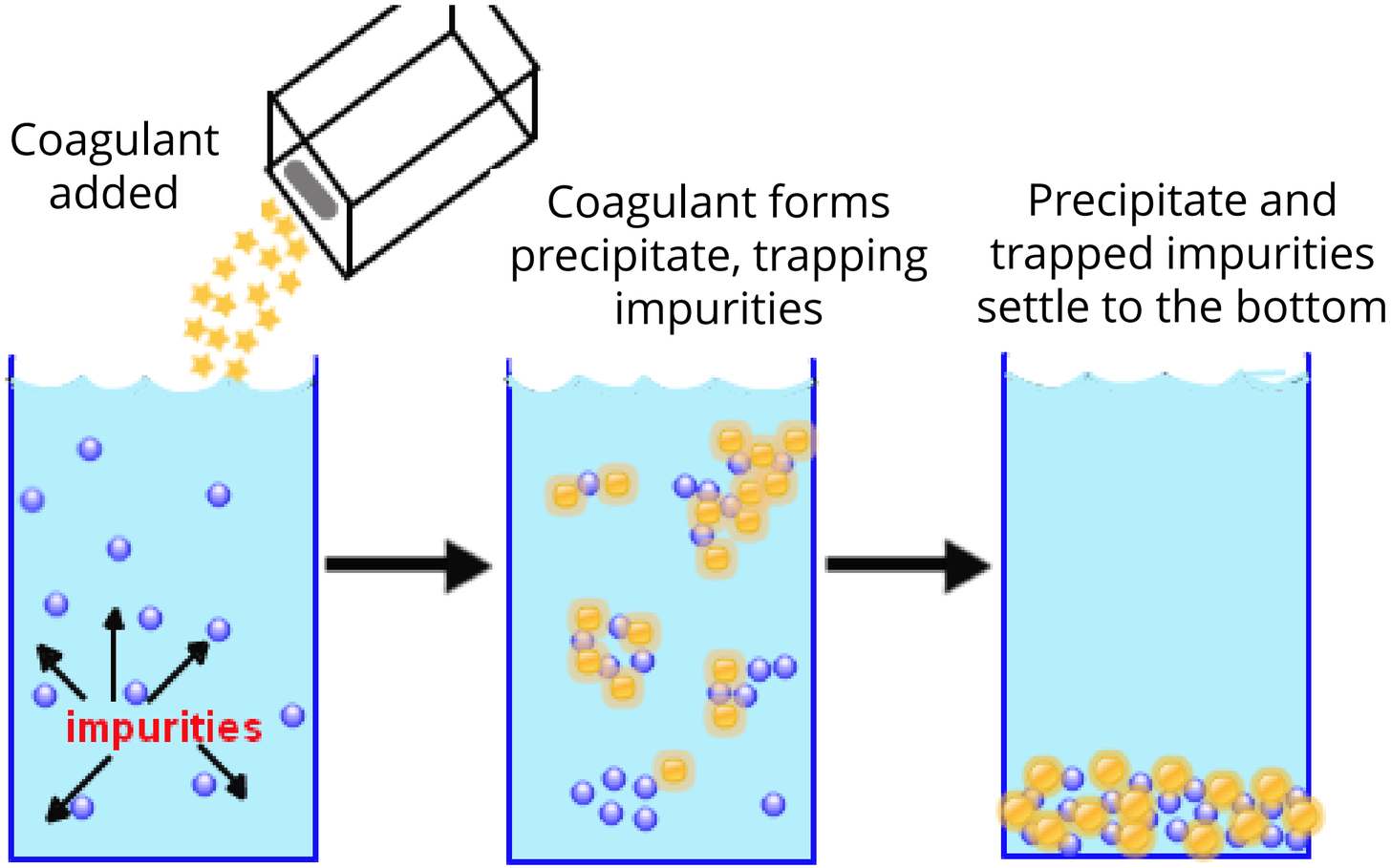


Sedimentation

Option 3: Sedimentation using natural/plant coagulants

- Moringa seeds (*Moringa oleifera)*
- Prickly pear cactus *(Cactus opuntia)*

Coagulants: How does it work?



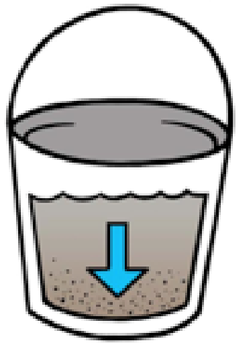
TIP

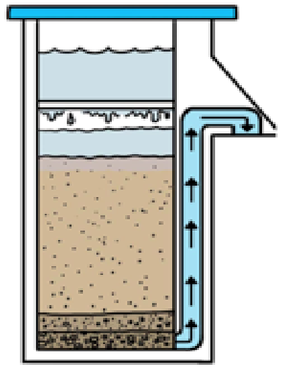
- Use clear buckets for demonstrations
- Use straining cloth when pouring into containers

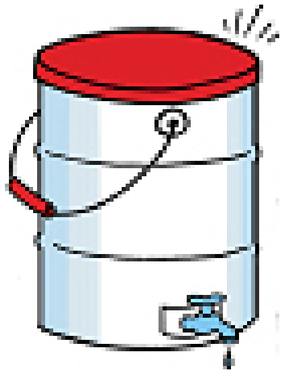
Source:chemistry.tutorvista.com

Multi-barrier approach

Source protection → **Sedimentation** → **Filtration** → **Disinfection** → **Safe storage**







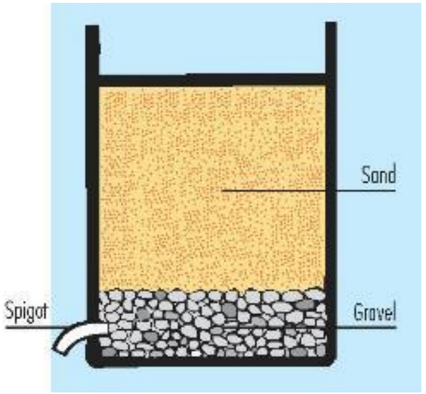
Source: CAWST (2009)

Filtration

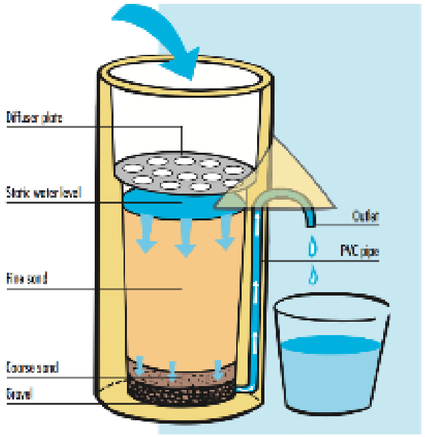
- Filtration is often used after sedimentation to further reduce turbidity and to remove pathogens.
- A physical process that involves passing water through filter media – cloth, sand, ceramic or membranes

Cloth filter

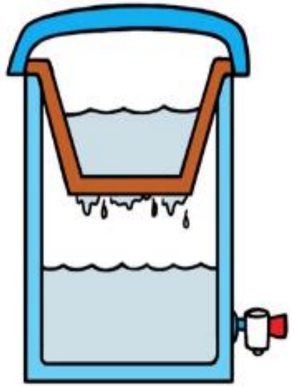
Sand filter



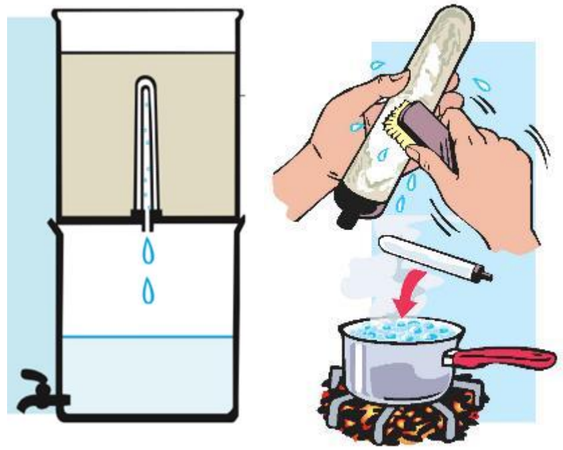
Biosand filter



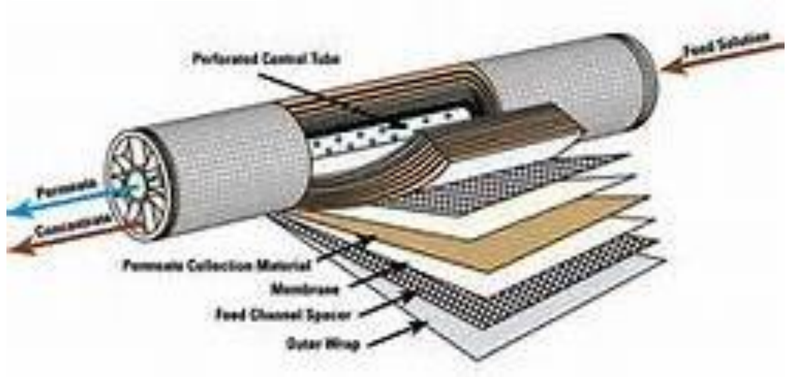
Ceramic pot filter



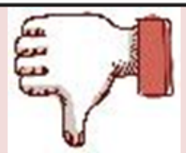
Ceramic candle filter



Membrane filter



Source: CAWST (2009)

		
Cloth filter	• Low cost • Minimal time required • Simple and easy to reduce turbidity • Known to reduce risk of cholera	• Require diligent washing of cloth after use • Fibres may loosen significantly over time • Cannot remove all bacteria and viruses
Sand filter	• Simple and fast to use • Effective at removing dirt and some disease-causing germs • Inexpensive if sand and containers are available locally	• Requires 3 containers (1 of which must have a spigot)
Biosand filter	• High removal of pathogens • Removal of turbidity, colour, odour and iron • Relatively high flow-rates (>30 L/hour) • One-time installation with few maintenance requirements and negligible operation costs • Long life • Can be fabricated from locally available materials • Easy to operate and maintain	• Biological layer takes 20-30 days to develop to maturity • Low rate of virus inactivation • High turbidity (> 50 NTU) will cause filter to clog and requires more maintenance • Requires that the filter be used on a regular basis • Cannot remove dissolved compounds • Can be difficult to move or transport (due to weight) • Lack of residual protection (risk of re-contamination) • Requires that the filter be used on a regular basis

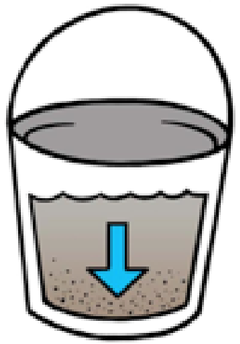
IFRC

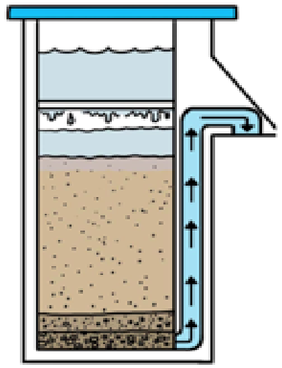
		
Ceramic pot filter	• Proven reduction of bacteria and protozoa in water • Simple to use • Proven reduction of incidence diarrhea among users • Long life is filter remains unbroken	• Not as effective against viruses • Lack of residual protection (risk of re-contamination) • Variable QC for locally produced filters • Filters can break over time – need spare parts • Low flow rate of 1-3 L/hr for non-turbid water • Need to be cleaned regularly esp if water is turbid
Ceramic candle filter	• Cheap, simple and easy to use and clean • Removes pathogens, turbidity and suspended solids • Somewhat effective for removal of viruses and iron • Improves taste, smell and colour of water • Generally durable, easy to move and transport (except clay pot)	• Does not remove all pathogens • Does not remove chemical contaminants • Highly turbid/iron-containing water plugs candle pores • Low flow rate • Clay pot can be fragile and heavy • QC is difficult in local productions
Membrane filter	• High performance • Simple operation • Able to separate different contaminants i.e. high selectivity • Disinfection can be performed without chemicals depending on pore size	• Equipment cost can be quite high • Membrane fouling which could lead to decrease of permeate flux • Production of polluted water from backwashing • Membranes have to be replaced on a regular basis

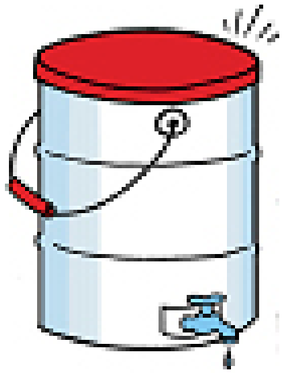
IFRC

Multi-barrier approach

Source protection → **Sedimentation** → **Filtration** → **Disinfection** → **Safe storage**







Source: CAWST (2009)

Disinfection

- Disinfection is a process cleaning something, especially with a chemical, to inactivate pathogens
- Disinfection is less effective when water is still turbid, therefore sedimentation and/or filtration before disinfection is a must

Boiling

Water must be brought to a rolling, bubbling boil

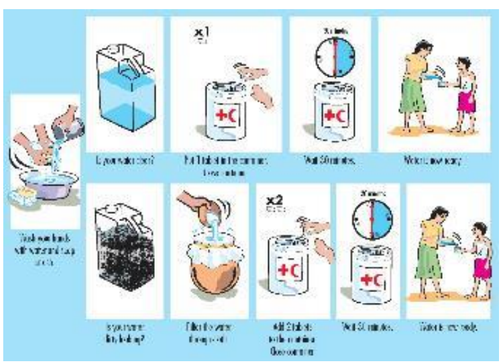
TIP Boiling will make water taste flat – this can be fixed with adding salt or shaking!

Solar disinfection (SODIS)

Exposing water to sunlight
Sunny – 5 hours; cloudy – 2 days

TIP Shake the bottle to speed the process up; also let the water cool before consumption

Chemical



Addition of chemicals such as chlorine tablets

TIP Chemical disinfection is not as efficient with dirty/cloudy water – use double dose if so

P&G™ Purifier of Water

- Purifier of Water contains 4g of powdered mixture: iron sulphate – remove suspended matter, protozoa and viruses; calcium hypochlorite – chlorine disinfectant to kills bacteria
- Removes 99.99999% common waterborne bacteria; 99.99% common waterborne viruses and 99.9% protozoa

Mix 1 packet of PuR into 10 L of raw water

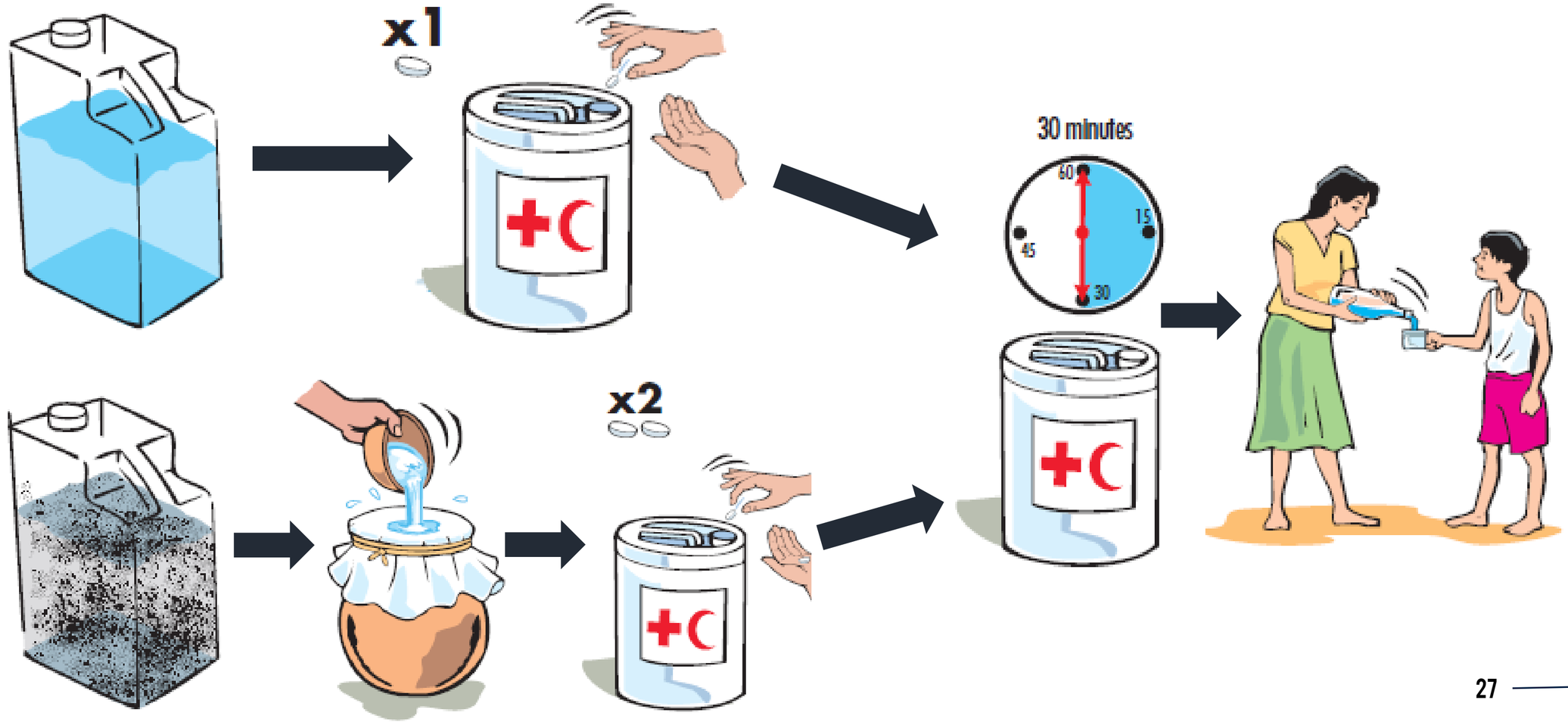
Stir well for 5 min, then leave for another 5 min

Filter through cloth; dispose floc away carefully

Wait for 20 min before consumption; store treated water safely

Aquatabs

1 tablet purifies 10 litres; each tablet contains 67 mg sodium dichloroisocyanurate



Multi-barrier approach

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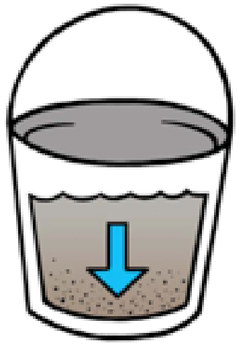
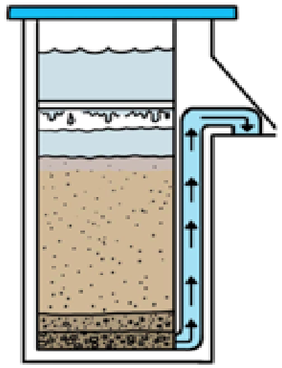
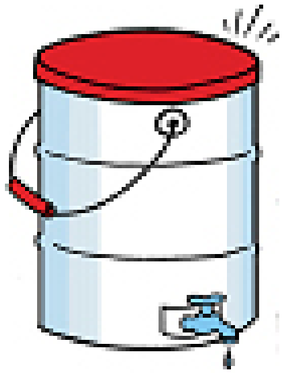




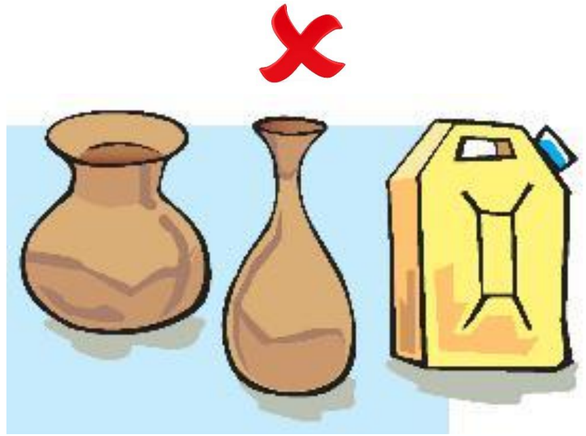


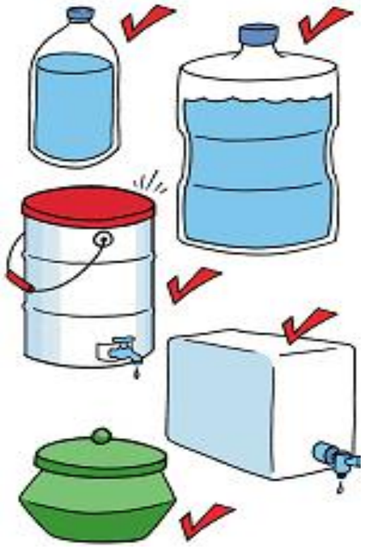
Source: CAWST (2009)

Safe water storage and handling

- All efforts to make water clean are pointless if the water is improperly stored or handled, especially at the household level

- Recommended water storage container features:
  - Tight fitting lid or cover
  - Tap or narrow opening
  - Stable base
  - Durable
  - Easy to clean
  - Locally available





TIP

- To clean narrow necked containers, use soap solution
- For wide necked containers, keep them covered and avoid coming into contact with water
- Use separate containers for transporting and storing water
- Avoid cross-contaminating drinking water
- Encourage handwashing prior to handling drinking water!

Rolling out HHWT&SS in the community

1. Visit the community

2. Choose method

3. Check water sources

4. Test the method

5. Get feedback

6. Plan distribution and train volunteers

7. Train the community

What should be monitored

No. of products distributed

No. of people trained

No. of water analysis done

No. of HH visits conducted

No. of education materials distributed

- **These numbers are not enough!**
- **Household visits must include the proper use of the HHWT&SS**

Key resources

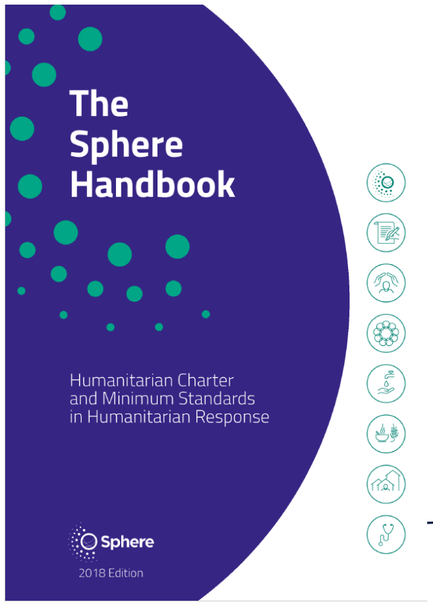
- Household water treatment and safe storage in emergencies: A field manual for Red Cross/Red Crescent personnel and volunteers
  - Download it at www.watsanmissionassistant.org/water

- Public health – Module 4: Household water treatment and safe storage (English)
  - Access it at https://ifrc.csod.com/ui/lms-learning-details/app/course/3fa34b66-850c-4419-b4b1-a1cd87f5d902

- The Sphere Handbook (2018) (under “Water supply” section)
  - Download it at https://spherestandards.org/wp-content/uploads/Sphere-Handbook-2018-EN.pdf

- P&G™ Purifier of Water - Official website

- Aquatabs - Official website



Key messages

- A **multi-barrier approach in HHWT&SS** is the most effective way to reduce health risks associated with contaminated drinking water. The approach recognizes that while each individual barrier may not be able to completely remove or prevent contamination, but together, the barriers work to provide greater assurance that water will be safe to drink over the long term.

- Involve/get feedback from **users** throughout the process.

- **No distribution without training!**

- **No distribution without monitoring!**

Q&A session

What's next

- Link to the dedicated **website** will be emailed by end of today (where you can find resources, webinar recordings, etc.).

- The **quiz** will cover key messages from the webinar presentation (*tip: refer to the presentation slides & listen to the recording if need be, before taking the quiz!*). The quiz will be valid from now onwards until **4pm KL time, 6 Oct 2022**.

- For webinar #3, there will be **15 questions** with a passing mark of **80%**. You will be allowed **2 attempts** for each quiz and for each attempt, you will be given **30 mins** to complete. You will need to pass all quizzes to be eligible to apply for the face-to-face training in November.

- By participating in this webinar, you will be now added to our regular **Health and WASH newsletter mailing list**. If you prefer not to receive these newsletters, please unsubscribe at any time by clicking the link in the newsletter.

If you have any questions in relation to the webinar series or the surge training, please drop a line to wendy.neoh@ifrc.org

Next webinar

6 October 2022
4pm KL time

Webinar #4:
Sanitation in emergencies