Home-made Chlorine, for Sustainable Use

1. Introduction

The Community-led Accelerated WASH Project, Phase IV (COWASH IV**)** focuses on the provision of clean drinking water and improved sanitation together with the construction of institutional water, sanitation and hygiene (WASH) facilities. The sustainability of constructed facilities, maintaining the quality of the water provided and safe water handling at home and at education and health institutions are the also focal areas of the project. Safe water handling refers to the hygienic management of drinking water including adequate water treatment, storage and use.

The COWASH IV project is being developed to ensure that water used in the home and health, and educational institutions is treated to ensure that it is fit for human consumption. However, the required chemicals are not always readily available in the market and the issues of price and quality control have their own problems. Chlorine, in one of its safer forms such as hypochlorite, is one of the more common chemicals used for disinfection.

2. Uses of chlorine and chlorination

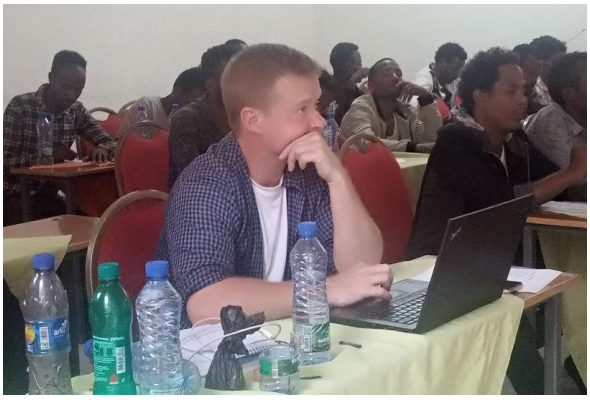
Microorganisms can be found in raw water abstracted from rivers, lakes and groundwater. While not all microorganisms are harmful to human health, there are some that may cause diseases in humans and are called pathogens. Pathogens present in water can be transmitted through a drinking water distribution system, causing waterborne disease in those who consume it. In order to combat waterborne diseases, different disinfection methods are adopted.

Disinfection was first used over a century ago and remains a key element of water treatment today. It is a chemical disinfection method that uses various types of chlorine or chlorine-containing substances for the oxidation of contaminating materials in order to render the water potable.[1]

3. Equipment and ingredients needed to manufacture chlorine at home

Noting the difficulties of purchasing chlorine in the marketplace, the COWASH IV team has been developing techniques for its manufacture in the home using simple, readily available materials and equipment. The main equipment needed to produce chlorine at home includes a container for making the salt solution, a container for chlorine production, a pipette, an electrode, an electric wire and a battery. The materials are simply common salt (sodium chloride) and water.

[1] https://www.safewater.org/fact-sheets-1/2017/1/23/what-is-chlorination



Homemade Chlorine training for SNNP Region participants, November 2022, Shashemene



Homemade Chlorine training for Benishangul Gumuz Region participants, November 2022, Asossa

4. The process of making chlorine at home

The process adopted is known as the "electrolysis of brine", which essentially means running an electrical current through a salt-water solution (brine) made of common table salt. This can be done simply by submerging an electrode (connected to an electricity source) into the brine. This will start a series of chemical reactions, through which the sodium chloride in the brine will begin to convert into sodium hypochlorite. The sodium hypochlorite, or the chlorine, can then be used for disinfection purposes.

As the process is so simple, it allows for "Do-It-Yourself" (DIY) chlorine to be produced at homes or health centers for example. COWASH IV is currently field testing a commercially available device called a Mini-WATA Chlorinator and has installed it in a health centre in Barek Woreda on a pilot basis. The Mini-WATA Chlorinator is a simple electrode device which can be plugged into an available electric socket. A saturated brine solution is made by mixing approximately 350 grams of table salt into a litre of water, although it is advisable to make the solution salt saturated, as it will maximize the amount of chlorine that can be produced. The device is then submerged into the brine. The speed at which the chlorine will be produced is a function of time and the amount of electricity running into the solution. It is evident that significant amounts of chlorine can be produced with only a small energy input. Indeed, the Mini-WATA Chlorinator can produce enough chlorine to disinfect some 5,000 litres of water in just a couple of hours.

The concentration of chlorine produced can be measured with a reagent. The Barak woreda health centre was provided sufficient reagent to enable them to monitor their chlorine production process.

5. Opinion of beneficiaries

COWASH IV focuses on supporting stakeholders to make quality and cost-effective water treatment chemicals, especially hypochlorite solution, readily available at home. Accordingly, efforts have been made to create a good understanding of the process and to encourage commitment by explaining in details during the ongoing water quality training programs. To date, training has taken place for the water and health professionals of the Southern Nations Nationalities and Peoples, Benishangul Gumuz and Amhara Regions.



Ville Jussela, FTAT, JPO during training at the Lencha Health Center, Barak Woreda, Oromia, December 2022



Ato Abera Bodena, Laboratory Technologist at Lencha Health Center, Barak Woreda, Oromia, December 2022

In December 2022, the COWASH IV Federal Technical Support Team, Junior Professional Officer, Vile Jussela, gave practical training to the Lencha Health Center professionals in Oromia National Regional State, Barak Woreda on how to easily prepare chlorine at home.

One of the trainees was Ato Abera Bodena who is a Laboratory Technologist at Lencha Health Center, Barak Woreda, who explained *"I never thought that chlorine could be produced so easily at home or at my workplace. Until now, we have been buying water treatment chemicals from the market to treat the water and* for general purposes, cleaning surfaces or sanitizing purposes *we use for our health center. The quality of the chemicals we were buying was also a concern, sometimes not being readily available in the market. Even the most cases the cost challenged us. As a result, we have been forced to provide various services using untreated water. This had a negative impact on the health of the health Center community."*

Ato Abera further stated "*The capacity building and material support we have received now will help us to obtain quality water treatment chemicals by preparing chlorine at our health center at a low cost. We can produce chlorine as much as we need at once and use it for a longer time in a sustainable fashion. This will fill the gap we had regarding service provision related to the shortage of disinfecting agent supplies at our health center."*

Ato Abera Bodena, who expressed his gratitude for the COWASH IV project that created this awareness, asked that to support their health center whenever there is a need in the future.

6. Conclusion

COWASH IV needs to pay proper attention to properly protecting and taking care of drinking water from the source, storing it in a hygienic way at home, and treating the water we use for various purposes. Thus, the COWASH IV project believes that homemade chlorine production can be a remedy to solve multiple problems.