

Bringing clean water to developing nations

December 10 2013, by David L. Chandler



Pure Home Water has reached more than 100,000 poor rural women, children, and families with safe drinking water via ceramic pot filters produced at a factory in Tamale, Ghana.

"It's been a long, hard slog," says Susan Murcott, a senior lecturer in MIT's Department of Civil and Environmental Engineering, describing her efforts to disseminate water-filtration systems to some three million people in northern Ghana. About half of these people presently lack access to a reliable supply of clean drinking water. But after nine years of efforts by Murcott and her students, the project has begun to make a difference.

Factories that produce these locally sourced, clay-pot filters—originally invented by Fernando Mazariengas of Guatemala and since improved and widely disseminated by Murcott and others—have already been built at 52 locations in 31 countries, she says, with the newest of these factories in Guatemala, Uganda, South Africa, and China. So far, the Ghana factory, built in 2011 and reaching full production last year, has provided sustainable, safe drinking water to more than 100,000 people in that country's impoverished, rural northern sector. In January, 10 MIT students will work there to help expand production and monitor outcomes.

The filters—made with a mixture of local clays and precisely sieved, combustible material, such as rice husks—have been shown to reduce microbial contamination in water by 98 percent, leading to a more than two-thirds decrease in diarrheal disease among families using them. The combustible material burns off when the clay is fired, leaving a network of tiny pores that serve to filter out sediment and microbes as water trickles through; the filter is further treated by the application of colloidal silver nanoparticles that have antimicrobial properties. One such filter can produce enough [clean water](#) daily to serve the needs of a large family.

Murcott and colleagues recently received grants from the government of Dubai, which will allow them to expand production and distribution in Ghana, Guatemala, and Nepal.

In addition to clean water, Murcott has worked to improve sanitation in Ghana, where most communities lack improved toilet facilities. Together with D-Lab student John Maher and Ghanaian volunteers, and with support from the MIT Public Service Center, she recently built a large latrine facility at a school in Taha, Ghana. The team will expand in January to a neighboring village, Gbalahi, which is seen as a critical step toward reducing preventable contagion.

About the size of New York state, "Ghana today has the fifth-worst rate of sanitation in the world," Murcott says, citing United Nations statistics. Open defecation is common, especially in the poorer, rural northern parts of the country.

Murcott began her career designing innovations for large urban sanitation systems, such as the wastewater treatment plant on Boston's Deer Island, but soon realized that the greatest need for sanitation lay in rural, poor regions or urban slums where such systems were unaffordable. She has since turned her attention to improving access to water, sanitation, and hygiene in developing nations.

But it's been a hard road, she says: Everything has taken longer than expected, with difficulties in supply chains, communication—Ghana has more than 50 different languages—illiteracy, and poverty. The filtration systems produced by the factory Murcott's company set up cost \$10 to make, but are sold for \$6 to the rural poor—still a steep price in a place where most people earn less than \$1 a day. (Large agencies have sometimes paid full price and then given the filters away for free.)

But the country is politically stable, most people with a primary level of education speak some English, and "the people are really friendly and welcoming," she says. "That's what has kept me going back."

Murcott says her commitment to the production of these filters in Ghana over the last nine years has been driven by two things: maintaining trust with the people of that region and the project's impact on MIT students—roughly 125 of whom have traveled to Ghana. "Part of the reason I do this work," she says, "is I like to see students have their worlds blown open, to have them realize it's a bigger world out there than just here."

This story is republished courtesy of MIT News

(web.mit.edu/newsoffice/), a popular site that covers news about MIT research, innovation and teaching.

Provided by Massachusetts Institute of Technology

Citation: Bringing clean water to developing nations (2013, December 10) retrieved 8 May 2024 from <https://phys.org/news/2013-12-nations.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.