



Emergency Water Treatment System Developed at Sri Lankan Universities

By:

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Photo: Students and Staff at the Environmental Engineering Laboratory at the University of Peradeniya working over the documentation for the water treatment system. The first author had been a member of the staff here.

In the aftermath of Tsunami, a pressing problem for the affected is the lack of potable water. The Tsunami left many coastal wells contaminated with seawater and debris. Providing clean water for drinking and other uses for the affected populations in temporary camps had become a problem. The immediate solution was to fetch water from inland wells which were assumed to be uncontaminated by the Tsunami. However, this solution was not adequate for regions such as Batticaloa where the inland wells could not support the regular population and the refugees.

Soon after the tragedy, students and faculty staff from the University of Peradeniya deployed to the Trincomalee, Batticaloa, Ampara, and Hambantota Districts. Students organized themselves to provide medical, technical and humanitarian assistance. They understood the need for low-cost toilets, stoves, temporary housing and an emergency water treatment system. At the University, they developed a prototype emergency water treatment system under the guidance of instructors and supported these efforts through funds collected from the community. Funds collected from the community in New York too were provided to the students to aid with transportation and other basic needs.



Photo: A prototype Water Treatment system was set up in the Eastern University for testing.

Emergency Water Treatment System

The prototypes developed by the students and faculty, were deployed to several districts to provide a temporary solution to the water shortage but these were not picked up everywhere. For instance, one of the demonstration systems provided by the students to the Navy was only decorating a parapet wall in its yard a week later. Yet, the tanks were welcomed in other districts such as Batticaloa where the quality of the water is questionable and transporting water from inland wells was difficult.

Increased Need in Batticaloa

There was a request for water treatment equipment, from Prof. Raveendranath the Acting Vice-Chancellor at the Eastern University to Dr. M.C.M. Iqbal a colleague of author Dr. Zubair. This request came after tests proved that almost all the wells, even those inland, have been contaminated by the Tsunami and are unsuitable for human consumption. The lack of inland wells has exacerbated the need for a solution to the lack of potable water.

In Polgolla, a group coordinated by Dr. Zubair at the Natural Resources Management Services including Chemical Engineer (Manjula Siriwardhene), Civil Engineer (Janaki Chandimala) and technician (K.B. Jayasundera) fabricated a demonstration of a prototype in a day based on the Peradeniya design.

Testing the Water Treatment System

The prototype developed by University of Peradeniya members was transported to the Eastern University's Disaster Management Centre (DMC). This disaster management centre located in Batticaloa town is housed in the University's nursing unit which now

serves as a central location for providing assistance to refugees. Here, University students and the faculty provide support with meager resources to re-establish the area. Dr. Manobhavan Manoharan and Assistant Lecturer Thivyatharsan of the Eastern University Agricultural Engineering Department have developed their own water treatment system to remove hardness of the water. The team including Thivyatharshanan, Manobhavan, Jayasundera, Iqbal and Zubair installed the unit fabricated at Polgolla at the Eastern Universities Disaster Management Center.

Tests were undertaken using water samples from the Thiruchenthoor and Periyappodai refugee camps in Batticaloa. The testing was performed under the supervision of Eastern University staff in the Chemistry and Biochemistry Departments. They found that the unit was effective in purifying water to meet the water quality standards of The World Health Organization (WHO) and that it was able to eliminate turbidity and pathogens. The results while favourable also show that the unit cannot remove high amounts of salt by itself. Excessive salinity may be removed by boiling the water.

Need for Caution

Despite the possible solution this water treatment prototype can provide, some scientists expressed the need for caution. The details of the plant was made available by the University of Peradeniya and disseminated via the Internet Resource Centers (<http://www.geolanka.net> and <http://www.recoverlanka.net/>) Geetha Selvendran, a geologist in Florida who specializes in water quality standards and purification methods had concerns once she saw this in these sites. Her main concerns were the effectiveness of the system in purifying water and the need to make sure that the drums used had not contained anything toxic previously.

She also felt that although this emergency unit may be suitable for normal use, it is not capable of dealing with the severe contamination resulting from the Tsunami. The drinking wells are experiencing extremely high levels of debris, waste, and high concentrations of pathogens, which some scientists feel cannot be killed by the simple chlorination method alone. Thus it would be best to avoid trying to treat water that was directly contaminated by the Tsunami wave.

Most importantly Dr. Selvendran stresses testing the well water before treatment in order to have a complete understanding of what chemicals and contaminants are present. Purification methods can be adjusted according to those results. She was able to visit Eastern University to see the situation for herself and as there was a need for water treatment she came to the view point that given the circumstances some compromises had to be made so that water of decent quality would be available for other uses at refugee camps even if not for drinking. Dr. Selvendran cautions that the water should be treated not just for drinking but also for cooking, washing dishes and brushing teeth.

Appeal for Assistance:

Developing safe low-cost techniques to solve the drinking water shortage in Tsunami affected areas meets a primary need of the affected. The efforts of the students and faculty at The Eastern University and The University of Peradeniya help to provide an affordable solution for water treatment.

The Eastern University now hopes to provide this water purification system to the affected areas free of charge but is now in need of financial support. These efforts were coordinated by the University's Centre for Sustainable Agriculture and Resources Management (CENSARM) at the Faculty of Agriculture. The estimated cost of one unit is Rs. 10,000 (US \$100).

To help the team to develop and distribute this water treatment system, please contact: CENSARM, c/o Tsunami Information Center, EUSL, Telephone: +94-65-2240732, Website: <http://www.eusl.info/> Email: office@eusl.info. More details regarding this work is at <http://www.recoverlanka.net> and <http://www.geolanka.net/>