

Establishment of A Community-based Water Quality Monitoring Program In The Remote Outer Islands of The Republic of The Marshall Islands

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Abstract

Unlike the Outer Islands, Majuro and Ebeye atolls have separate reticulated water supply systems. Majuro which is the capitol of the Marshall Islands (about 60% of total population) utilizes rainwater harvested from the Majuro International airport runway coupled with groundwater which is pumped from Laura at the western end of the island to the airport water reservoirs. The water is sand filtered and chlorinated prior to distribution for public use. Ebeye (30% of the total population) on the other hand, uses two RO units (100,000gpd per unit) but undergoes chlorination before it gets distributed. Its source of water is brackish groundwater. The Outer Islands comprising the remaining 10% of the total population rely solely on rainwater and groundwater in times of drought.

In 2003, the Republic of the Marshall Islands Environmental Protection Authority (RMIEPA) along with Cooperative Research & Extension Water Quality Program or (CRE-WQP) established a Community-Based Water Quality Monitoring Program in the remote Outer Islands of the Republic to serve several purposes. One was to establish a bacterial baseline data for drinking water sources, mainly rainwater catchments or tanks. Secondly, to raise the community awareness on water quality issues – poor quality water and its health impacts on youth and the elderly, and to establish baseline data on how many sanitary facilities are available on each atoll/island. Thirdly and most importantly, to educate the community to monitor the quality of their own drinking water sources and to liaise with RMIEPA and CRE-WQP in sharing of environmental data that they collect in their own atolls/islands and in return both RMIEPA & CRE-WQP to help Outer Islands counterparts upgrade their knowledge on environmental monitoring including basic water quality testing and skills in reporting back to RMIEPA.

Since bacteria contamination is generally more prevalent in rainwater tanks than other contaminants (Fujioka, Krishna, 1991) the water quality parameter emphasized in the survey is the presence/absence of pathogens (disease causing organisms). The test uses the newly developed hydrogen sulfide (H₂S) test which when compared to the traditional coliform membrane filtration method, the H₂S test is easier and cheaper to perform. The H₂S test screens for the Absence (A) or Presence (P) of pathogens using the ready made PathoScreen media. Only rainwater tanks or cisterns were targeted as there are no surface waters nor community water supplies in remote atolls/islands except for the urban centers of Majuro and Ebeye. A community awareness campaign was performed at each

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atoll/island during the on-site visit and testing or meeting with the community at a meeting hall to share test results and what to do with contaminated waters.

In 2003, 232 samples were tested and 174 or 75% of the samples were contaminated. In 2004 till early 2005, 947 samples were tested of which 239 or 25% was found contaminated. In March and April of 2005, a workshop and training on how to establish a community-based WQP for Outer Islands were conducted in Majuro. The results were very promising; for Ailuk Atoll, for example, testing of water samples from rainwater tanks showed 62% contamination before the workshop and only 7% contamination after the workshop.

Keywords

Pathogens, Hydrogen Sulfide, Water Quality Monitoring, Marshall Islands, Pacific Islands