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Summary

Objectives – The study was conducted to assess the feasibility of harvested rainwater as a source of low fluoride water in a fluorosis prevalent area in Puttalam District.

The study design – This is a descriptive study conducted in the Inginimitya PHI area in Puttalam District and comprised of three components. The first component involved the measurement of dental fluorosis status in the area. This was measured by assessing all fifteen year old school children with life long residency in the area (n=182) using the Dean's fluorosis index. The second component involved the chemical analysis of fluoride levels of collected rainwater (n=27) and other common sources (n=27). A standard test (SPADNS test) was used in the analysis of fluoride concentration. The two sets of values were tested statistically for difference of means. The third component involved the assessment of the water collection method, safety and safe practices of collection and storage of water, adequacy and the problems encountered in the process, using an interviewer administered questionnaire and focus group discussions.

Results- Children with normal teeth comprised of 19.6% while 80.4% had fluorotic teeth. Majority of the students with flurotic teeth belonged to the questionable (30.1%) and very mild (29.3%) categories. The values on mild, moderate and severe categories were 16.3%, 4.4% and 0% respectively. There was a statistically significant difference ($t=9.414$; $p<0.001$) between the average fluoride levels of collected rainwater (0.272 ± 0.134ppm) and selected groundwater sources (1.27 ± 0.54ppm). As perceived by the householders collected rainwater was superior to the other water sources considered for selected physical properties, taste ($p<0.001$), colour ($p<0.03$), odor ($p<0.001$) and on the general acceptability ($p<0.001$).

Eighty nine householders with 'ferro cement' rainwater harvesting tanks (above ground) were assessed. Majority of the householders (92.13%) were following the standard criteria in collecting and storing water. Water is used for drinking (95.4%), cooking (91%), washing (65.2%) and other (62.9%) purposes. 25.8% of them use the water exclusively for drinking. 80.1% of the population was not using a water purification method. On average people were using the collected water for a duration of 4.4±0.9 months. Householders had to bare part of the cost of construction (Rs.2834.83 ± 1244.28) and assist in the construction (6.1 ± 2.1 days labour) process, but maintenance was not a problem.

Conclusion- Prevalence of dental fluorosis is high in the Inginimitiya PHI area but the severity is comparatively low. The level of fluoride in collected rainwater is significantly lower than the ground water sources. The people use the water for drinking and according to them the quality of the collected rainwater is better than the other water sources in the area. The water is used for other activities as well. It is used for more than four months at a stretch. The people practice correct methods for collection and storage of water. They are capable and knowledgeable in managing the resource. No practical problems were recorded in maintaining the rain water harvesting tanks. No health problems have been implicated to be caused by the collected water. Therefore rainwater harvesting tanks could be used as resource and collected rainwater as a source of low fluoride of water in this area.