

Determination of Heavy Metals in Drinking Water in Mandalay Region

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Abstract

Water is essential to sustain life and improving access to safe drinking-water can result in tangible benefits to health. In developing countries of the world, people use their drinking water sources from either surface water (rivers, dams, etc) or ground water (tube wells, hand pumps, etc). Contaminants such as bacteria, viruses and heavy metals have found their way into water supplies due to inadequate treatment and disposal of waste, industrial discharges, and over-use of limited water resources. This study aimed to assess the level of heavy metals in drinking water from tube wells in selected townships of Mandalay region. This study was the cross-sectional analytical study and it was done in 6 selected townships (Aung-Myay-Tharzan, Chan-Aye-Tharzan, Chan-Mya-Tharzi, Mahar-Aung-Myay, Pyigy-Tagon and Amarapura) in Mandalay region. Total 120 water samples, 20 samples from each township, were obtained from different tube wells. Lovibond Water Testing (Photometer SpectroDirect), Germany was used for testing turbidity, total hardness, chloride, cyanide and nitrite. pH, electrical conductivity and total dissolved solids of water samples were tested by using Pocket ProTMTester, China. Arsenic, calcium, copper, iron, magnesium, manganese, mercury, lead and zinc were analyzed by using Atomic Absorption Spectrophotometer (AAS), Shimadzu, Japan. Among 9 metals determined in this study, the levels of iron in all townships, manganese in 3 townships, arsenic and lead in 1 township respectively were detected more than the maximum permissible limit (MPL) of WHO. Concerning with physicochemical parameters, pH and turbidity were higher than MPL of WHO in 5 out of 6 townships. And hence, total dissolved solids in 4 townships and electrical conductivity in 3 townships were higher than MPL. Although those parameters were detected above the maximum permissible limit of WHO, the other remaining parameters were complied with the limit. Therefore, the quality of water samples were needed the constant monitoring and the people should be given the health education about the safe drinking water because people may be suffered from various diseases on drinking the water with the high concentration of heavy metals.