

SOURCE AND HEALTH EFFECTS OF FLUORIDE IN LAMPHUN PROVINCE, THAILAND

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Lamphun Province is located in the Chiang Mai Basin, Thailand. During the last couple of decades, the water demand in Lamphun Province has increased because of rapid industrial development and population increase. Numerous small-scale water supply systems using groundwater have been developed in sub-urban communities to meet the burgeoning demands. However, groundwater contains high fluoride up to 16mgF/L, which brought about dental and skeletal fluorosis among the residents. Thai Government installed RO membrane plants for the removal of fluoride from groundwater; and RO-filtered water is bottled and delivered to each household. Thanks to this effort, the fluoride levels in their drinking water have decreased significantly to the concentrations below the Thai Standard of 0.7 mgF/L. It was found in our survey, however, that the urinary fluoride levels are still high among the residents because many of them use fluoride-containing water, i.e. piped water supply and private well water, for cooking. Because the local people cannot pay for bottled water for all their water uses, it is very important to get the local people involved to come up with the water supply and water use planning to minimize the risks arising from ingestion of fluoride-laden waters with the lowest expenditure of their households. For this purpose, the fluoride contents of various water sources, such as village water supply systems, shallow and deep groundwaters, rain water and bottled water, were measured and the distribution of fluoride concentration in groundwater was made to identify possible geological sources of fluoride. In addition, the health impact of fluoride was investigated in collaboration with the local dentists. We visited local junior high schools to identify the dental fluorosis and took urine samples from them. There was a correlation between urinary levels of fluoride and dental fluorosis. The major source of fluoride was identified as their cooking water by interview survey.

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