

Temporal variation of contamination in perched water and groundwater at an open dumpsite in Sri Lanka

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In Sri Lanka, solid waste management is mainly focused on waste collection and dump into open dumpsites. The leachate produced from these dumpsites often pollutes surface water and groundwater. Identification of temporal variation for leachate and groundwater quality is an important factor when installing leachate treatment systems, since water quality depends on many factors. In this study, an open dumpsite was selected from wet zone, Sri Lanka, and its perched water inside waste layer and groundwater quality were monitored for two years (March 2013 to March 2015). Perched water and groundwater samples were collected with one month interval and samples were analyzed for 14 parameters. Leachate pollution index (LPI) and piper diagrams were used to analyze the temporal variation of water quality. Overall and sub-indices of LPI were calculated to identify temporal variation of risk for groundwater contamination. Groundwater samples showed constant and low LPI values except for the initial stage of the monitoring and those constant values were similar to those for the control, a well located at out of the dumpsite. LPI indices calculated for perched water is higher than that of groundwater, but it gradually decreased with the time. There is no considerable different observed in perched water and groundwater with respect to the presence of heavy metals. Reduction of LPI exhibited the high dissolution of the pollutants over the time. No correlation was observed between LPI and amount of rainfall received over the time.

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