

**ASSESSMENT OF SUB-LEACHATE POLLUTION INDEX (SUB -
LPI_{hm}) TO DETERMINE THE HEAVY METAL POLLUTION
POTENTIAL OF LANDFILL LEACHATE AT KARADIYANA
LANDFILL SITE**



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ABSTRACT

Leachates from landfill site cause environmental degradation and health hazards due to resultant ground water pollution. A technique to quantify the leachate pollution potential of solid waste landfills on a comparative scale is the use of index known as the leachate pollution index (LPI). The sub-LPI_{hm} is a quantitative tool by which the leachate pollution potential of heavy metal of the landfill can be reported uniformly. The sub-leachate pollution index for heavy metal provides a convenient means of summarizing complex about heavy metal pollution data and facilitates its communication to decision makers and the general public. This study attempted to assess a sub-LPI_{hm} of Karadiyana landfill site which is located between Thumbowila and Werahera in Kesbewa Divisional Secretariat Division in Colombo district.

Delphi technique was used to select the initial set of parameters. This involved an opinion survey of 30 experts working in the disciplines of environmental chemistry, environmental toxicology, pollution control, water quality, etc. The sub-LPI_{hm} formulation process involved in selecting key variables based on expert ratings and deriving the rating curves for selected 5 heavy metals. The sub-LPI_{hm} was calculated by using the software (Matlab 7.0), Version 7.0.0.19920 (R14). To make the sub-LPI_{hm} more informative, leachate samples were collected monthly during the period of September, 2015 to January, 2016. Samples were analyzed for Lead, Zinc, Nickel, Chromium and Arsenic which were selected based on the expert opinion survey. The sub-LPI_{hm} values of the points were A (0.5267), B (0.5159), C (0.2603), D (0.0824), E (0.0814), F (0.0866) and G (0.1493). The overall sub-LPI_{hm} value of Karadiyana landfill site was 0.2433.

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