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IDENTIFICATION OF SUITABLE SITES FOR ESTABLISHING LANDFILLS

P. Sangeevan*, V. Daksiya, R. Ragulan and G.B.B. Herath

Department of Civil Engineering, Faculty of Engineering, University of Peradeniya, Sri Lanka
**p.sangeevan@gmail.com,*

Solid waste management has a fair contribution towards the control of pollution in countries like Sri Lanka due to the escalating quantity of solid waste being disposed. Selection of a suitable disposal method is one of the primary factors in solid waste management today. Among the techniques available, a method widely used with a cost effective approach has been land-filling. The sites suitable for land-filling must satisfy engineering and socio-environmental aspects related to it. Therefore, this study was aimed at finding a procedure for the identification of suitable sites for establishing landfills (LF) in Kandy. Central Environmental Authority (CEA) in this regard has published a set of guidelines for the selection of LF sites with number of constraints.

Based on the guidelines and literature, Population distribution, Surface water, Road network, Slope, Land use pattern, Soil permeability and Ground water level were taken as decisive factors for this analysis. Of these factors, data on build-up area, location of surface water, road network, land use pattern and terrain were readily available. Using Geographic Information System (GIS) as a tool, the above available data was analysed to obtain suitable LF locations giving equal weights for all influencing factors. Soil permeability and ground water level are important factors where data are lacking. Using Guelph permeameter the in-situ permeability was measured. The ground water level was estimated using existing surface and groundwater sources with mean sea level recorded by Global Positioning System (GPS). During site visits, it was established that different areas have different dominant factors. For example, in Nawalapitiya the terrain played a major role and in Kundasale population was the major issue. Initial analytical results from the GIS tool shows that, suitable land available for landfill under the CEA guidelines was scarce within the Kandy district, especially close to urban centres. Therefore, guidelines from countries in the region were compared with CEA guidelines.

Comparison shows that the guidelines from India, Thailand and Nepal are much stringent than ours. Since local guidelines were the most relaxed, factors from the Southern province were used with the same CEA guidelines for our analysis. Results revealed more potential sites. That showed, reality of each factor was not always equally critical but some were more critical than others depending on the location. Since forced changes (people resettlement *etc*.) can alter impacts of certain influential factors, factors were given different ratings (weights) depending on alterations available (multi selection criteria). Rating factors used were; 5 for distance from nearest water body (most difficult to alter), 3 for distance from landfill to waste generation area, 2 for distance from the buildings and 2 for steepness. Developed risk maps taking into account possible site alterations (forced changes) showed promising results for identifying suitable sites for landfills. Furthermore, engineering solutions can lead to choose a cost effective location for landfill too. However, further investigations especially site investigations are required to make a final decision.