

## **LOCATING SUITABLE SITES FOR SOLID WASTE LANDFILLS IN MATARADISTRICT USING GIS AND AHP**

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### **ABSTRACT**

Landfill site selection in highly populated areas is a critical issue in today's society because of its enormous impact on the economy, ecology and the environmental health of the region. Present study was conducted to find suitable locations for landfills in Matara district, which is a highly urbanized area. Geographic Information Systems and Analytic Hierarchy Process were integrated in this study to solve the landfill site selection problem. Waste collection and population data of the study area were used to estimate the cumulative waste amounts up to the year 2020 and the minimum effective area needed for landfill sites.

Eleven landfill siting constraint criterion maps including surface water, forest reserves, wetlands, coastal zone, rainfall, town centres, residential areas, important buildings, major roads and railways, slope and soil were prepared and unsuitable areas for landfills were determined according to the existing regulations. Further evaluation of the remaining suitable areas in three categories of high, medium and low priority for being suitable for landfill sites was done using factor criteria.

Depending on the relative importance of the identified criteria, weights were calculated by Analytic Hierarchy Process and were incorporated in to the analysis. The maps prepared for each criterion were then overlaid in Geographic Information Systems environment to obtain the final suitability. The resulting final factor map shows a land area of 112.4 km<sup>2</sup> from Matara district as highly suitable for landfill areas.

Field investigations show that Thalpawila, Parawahera and Kekanadura have most suitable areas for landfill sites at Matara district.

**Key words:** AHP, criterion, GIS, landfill