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SITE SELECTION FOR WASTE DISPOSAL USING GIS

A PROJECT REPORT PRESENTED BY

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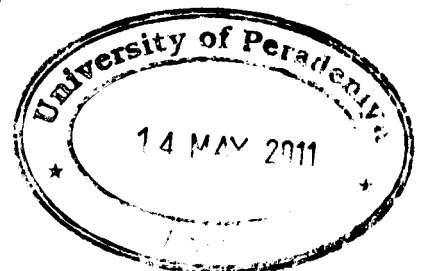
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ABSTRACT

One of the serious problems in most of the large urban areas is the shortage of suitable land for waste disposal. An inappropriate waste disposal site may have negative environmental, economic and ecological impacts. Therefore, it should be selected carefully by considering both regulations and constraints on other sources. Huge amounts of a variety of data can be manipulated and displayed quickly and easily with the GIS technology. In this study, suitable sites for waste disposal in the UC area of Gampola are determined by using GIS techniques. Project being carried out involves the use of GIS to record, store and display a wide range of information of the spatial data related to selecting waste disposal site.

The data for the study were gathered from Survey Department, Land use Policy Planning Division, Natural Resource Management Center, Geological Survey & Mines Bureau, Meteorological Department and Gampola Urban Council. For this purpose, eight input map layers including elevation, land use, roads & railways, geology, groundwater, surface water, soil, and rainfall were used. Field survey was done to collect the location and the water levels of dug wells in the study area. The observed point data were used to generate the thematic map of the depth of groundwater by point interpolation using IDW. The slope map of the study area was generated using the above elevation data.

The key criteria to be satisfied for the selection of the most suitable waste disposal site were defined for each map layer. The weighting method used was multi class index method which assigned weights for individual maps and then assigned scores for different classes within each individual map in GIS environment. At the first step the landslide distribution map of the study area was generated using weighted overlay method and it was used as one input layer for the site selection. Finally weighted overlay was performed to find the site suitability map.

A handheld GPS was used to collect the positional coordinates of dug wells in the study area. Preparation of maps and analysis of spatial data were performed using ARC GIS 9.2 (Arc/Info) version. Non spatial data were tabulated in Microsoft Excel and linked to GIS.

The result obtained in this study was two suitable sites for waste disposals in Gampola UC area. The selected sites were presented on a map in 1:20,000 scale. Then field checks also confirmed that the selected sites agree well with the defined criteria. Capacity of almost all the selected sites were less than 0.5 hectares. The required site should have at least one hectare according to the amount of waste generation of the UC area. But there was no sites satisfying that total capacity requirement although the other conditions were satisfied. The conclusion derived in this study was no sites satisfying the total capacity requirement of the Gampola UC, although the other conditions were satisfied.