

SITE SUITABILITY ANALYSIS FOR SOLID WASTE DISPOSAL IN VAVUNIYA DISTRICT, SRI LANKA

H. Jayaweera^{1*}, S. Devaisy¹, S. Wijeyamohan¹ and A. Nanthakumaran¹

¹*Department of Biological Science, Faculty of Applied Science, Vavuniya Campus of the University of Jaffna, Vavuniya, Sri Lanka*

^{*}*harshii.uj@gmail.com*

Open dumping of Solid Waste (SW) has become a challenging issue in Sri Lanka and causes environmental pollution and public nuisance. Vavuniya District is no exception, and mixtures of all types of SW collected within the Urban Council limits are collectively emptied in Pampaimadu which is 10 km away from Vavuniya town. The partial burning of SW in the dump site aggravates air pollution and nuisance which was reported by the residents living proximity to the dump site. As an alternative measure, construction of sanitary landfill would be an appreciable option considering environmental safety. However, finding a suitable site for a sanitary landfill is the challenge for the district as environmental, demographic and social factors have to be considered. The aim of this study is to identify suitable sites for municipal SW disposal for Vavuniya District considering all the relevant environmental and social factors using Geographic Information Systems (GIS) techniques. In this context, factors such as; surface water bodies, land use pattern and transport network were considered for the GIS analysis which was performed on ArcMap version 10. Appropriate functions, such as buffering, rasterizing and reclassification, were performed to obtain the final output. The analysis was based on Multi-Criteria Analysis in combination with Weighted Overlay Analysis to identify and categorize the suitable areas for SW disposal site. The results revealed, 0.2% (3.96 km²) of the total area of the District is highly suitable; 35.6% (665.8 km²) is moderately suitable; 62.8% (1175.6 km²) is less suitable and 1.4% (26.0 km²) is unsuitable as a SW disposal site based on the sizes of bufferzones considering the degree of environmental safety. In addition, topographic elevation and groundwater table data must be considered along with the field validation for the selection of best possible site as well as to make sure the feasibility.

Keywords: GIS, MCA, Open Dumping, Sanitary landfill, Solidwaste