Landfill site selection using GIS and Remote Sensing

Deepak Parajuli, Nabin Dhital
Pashchimanchal Campus, Lamachaur, Pokhara
E-mail: bindaaspratiks@gmail.com

ABSTRACT

Finding and selecting the landfill site for disposing the solid waste is a serious challenge for the metropolitan cities like Kathmandu. Due to improper management of waste materials , different health hazardous diseases are growing. Global warming and methane gas production are also the serious cause of poor disposal which are badly affecting the environment and ecology. There are different methods for selecting the landfill site. The policy 3R viz. reduction, recycle and reuse adopted by metropolitan should be considered while disposing the wastes. The use of GIS, Remote sensing and analytic hierarchy become crucial while selecting landfill site. We obtain the satellite imagery covering Kathmandu and analysed using ArcGIS/ ArcView to determine geologically and geographically suitable place. GIS performs some deterministic overlay and buffer operation. Almost 12 criteria were used. Distance from waste generation center, distance from roads, slope, distance from settlements, distance to surface water, distance to groundwater areas, soil permeability, etc. are some of the criteria used. There criteria are given some relative weight according to its importance using analytic hierarchy. The map of suitable site is prepared using GIS spatial operations, rank the candidate site and the most suitable place is recommended.

OBJECTIVES

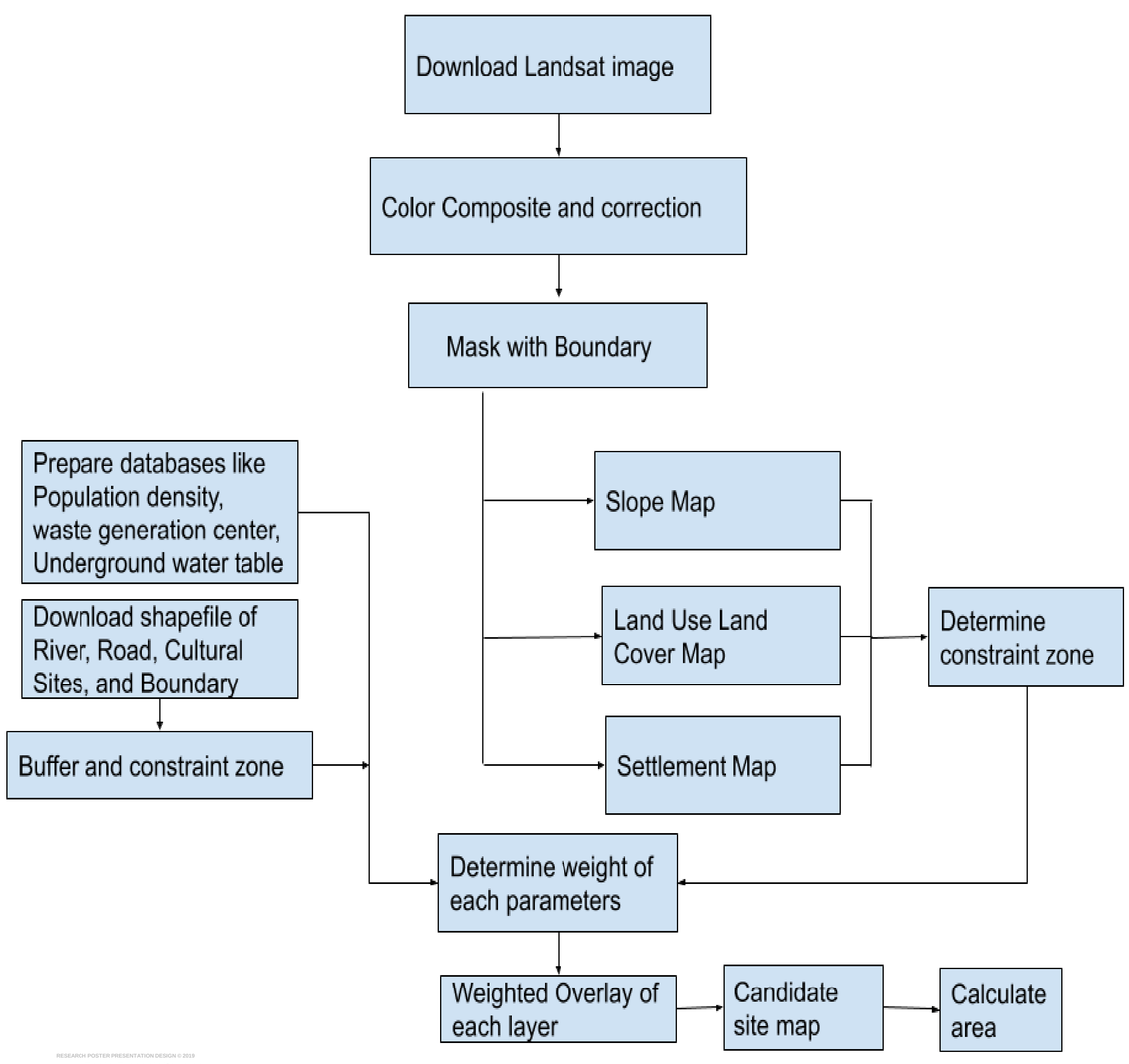
PRIMARY OBJECTIVE

- To determine the suitable landfill site in a progressively improving manner mainly in terms of cost, effort, and computational steps.

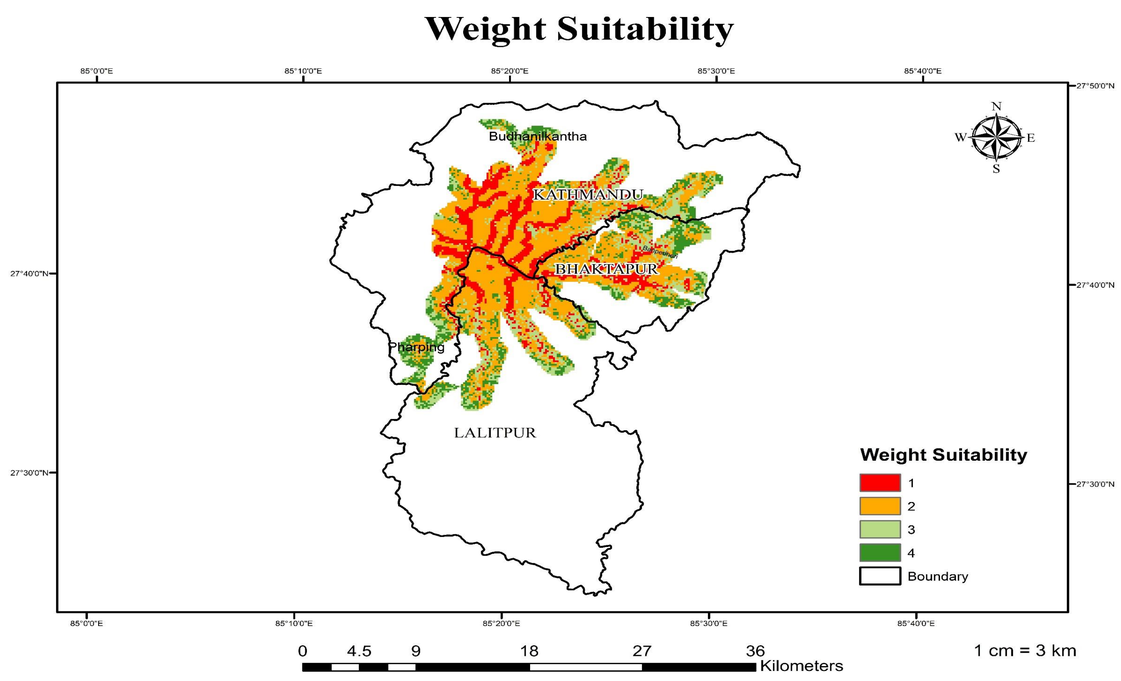
SECONDARY OBJECTIVES

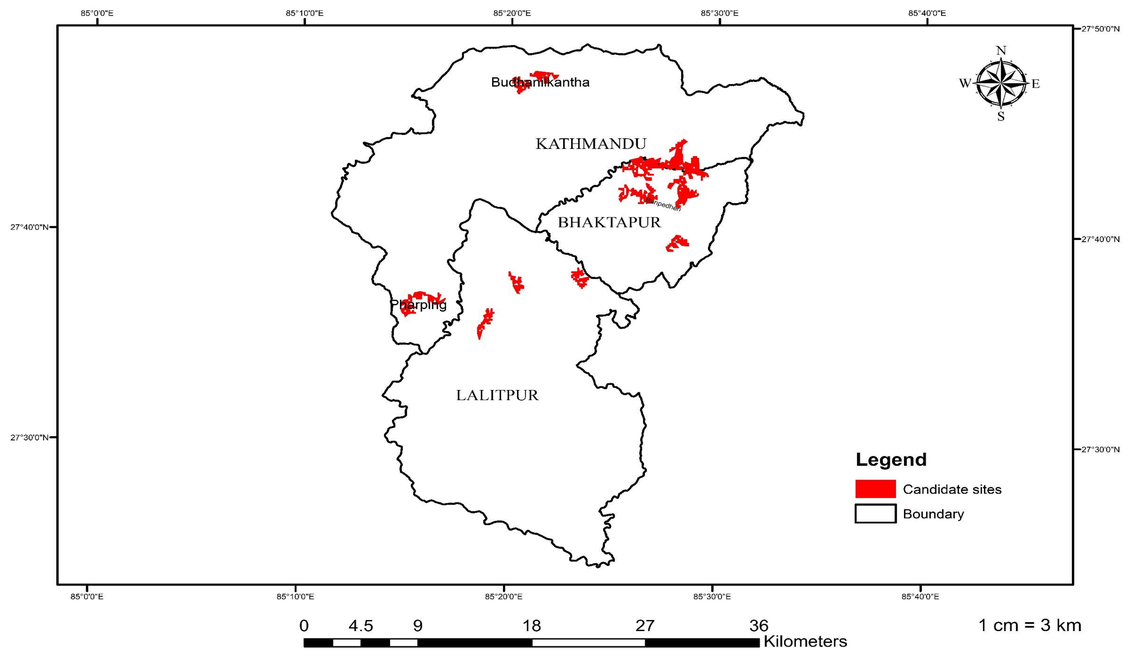
- Determine the slope, buffer zone of river, settlement areas
- Using different parameters, determine their weights and apply AHP

METHODOLOGY



RESULT AND DISCUSSION





CONCLUSION

The result concludes that GIS is a powerful tool that can perform spatial analysis and helps in planning. The use of remote sensing and GIS helps to integrate different parameters and the superposition of these modules then provided a map of suitable sites to establish a municipal solid waste landfill.

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