

# Geographical Information Systems (GIS) and Landfill Siting

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## Introduction

The siting of a landfill requires diverse geological, geotechnical, and environmental considerations, but must also satisfy legal restrictions and other social and cultural factors. Different types of interests must be weighted against each other, which is ranging from difficult to impossible. The siting procedure also requires the processing of a significant amount of data. Geographical information systems (GIS) can be useful since it provides spatial analysing tools to sort and interpret geo referenced maps.

Factors and interests controlling landfill siting area grouped and considered in three steps:

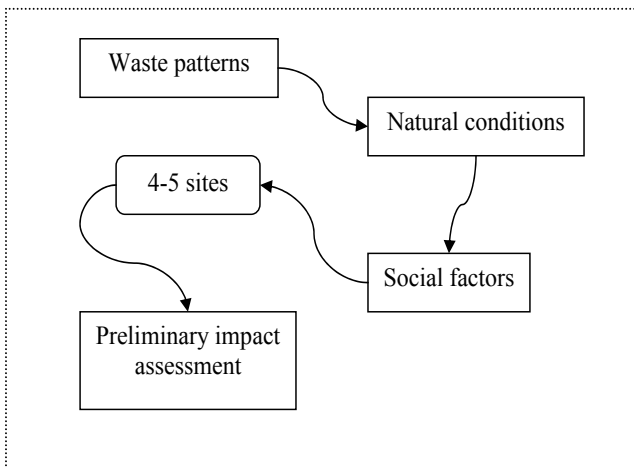


Figure 1. Stepwise approach for landfill siting.

On the basis of the groups, siting criteria are made. Analysis in GIS are made by using raster overlay analysis (figure 2).

The maps are reclassified so that preferable areas show the value +2 and forbidden/non preferable areas get the value 0. Areas which cannot be assigned a definite positive or negative value will be assigned a +1 value.

After making selections of suitable areas in the three groups, the maps are multiplied into one map, showing preferable, undefined (or neutral) and unsuitable areas. An environmental impact analysis is then done for each of the selected areas.

## Questions to be investigated:

- What are the interests that have to be considered when siting a landfill?
- How can GIS be used as a tool for landfill siting?
- How does the GIS impact on the problem analysis?

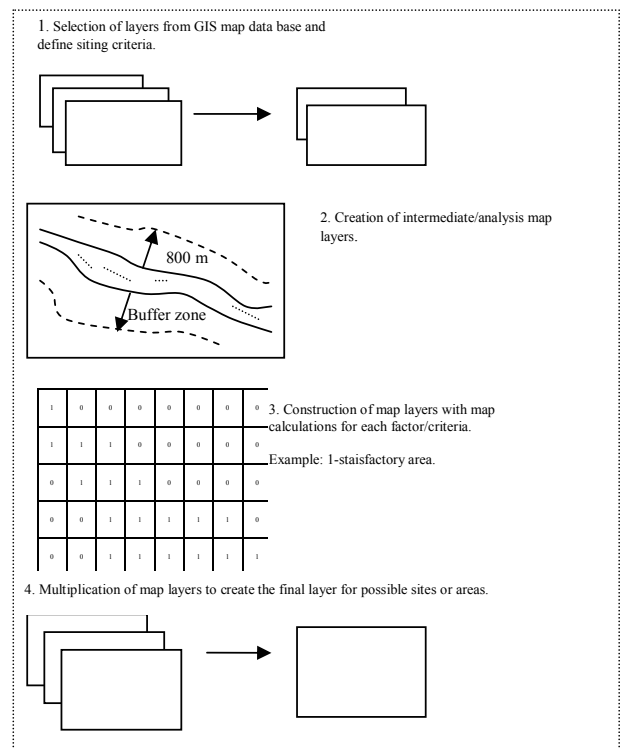


Figure 2. Raster overlay analysis. Rvised from Kao et al.1996

## Conclusions

The project is underway at the moment and results are pending. At the moment the investigations are focussed on the waste and environmental issues. For most of these factors one can either arrive at numbers, but even at these steps there are qualitative issued that must be judged by some criteria. A strategy for the selection and expression of such criteria becomes a key problem.

The quality of the GIS analysis is dependent on the siting criteria, which has to be decided by the user. The effect of this must be further analyzed. This also opens for other questions. Is it possible to use the same approach for landfill siting in other parts of the world?