GIS for Solid waste Management

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Solid Waste Management

- **Geographic Information System (GIS) is used to input, store, retrieve, manipulate, analyze and output geographically referenced data.**
- **In order to support decision making for planning and management of land use, natural resources, environment, transportation, urban facilities, and other administrative records.**

Solid Waste Management

- Data collection
- Satellite images, drones, aerial photos
- Digitising from maps, google earth,
- GPS
- Purchasing or downloading from other sources
- Survey, experiments, etc.

Solid Waste Managem

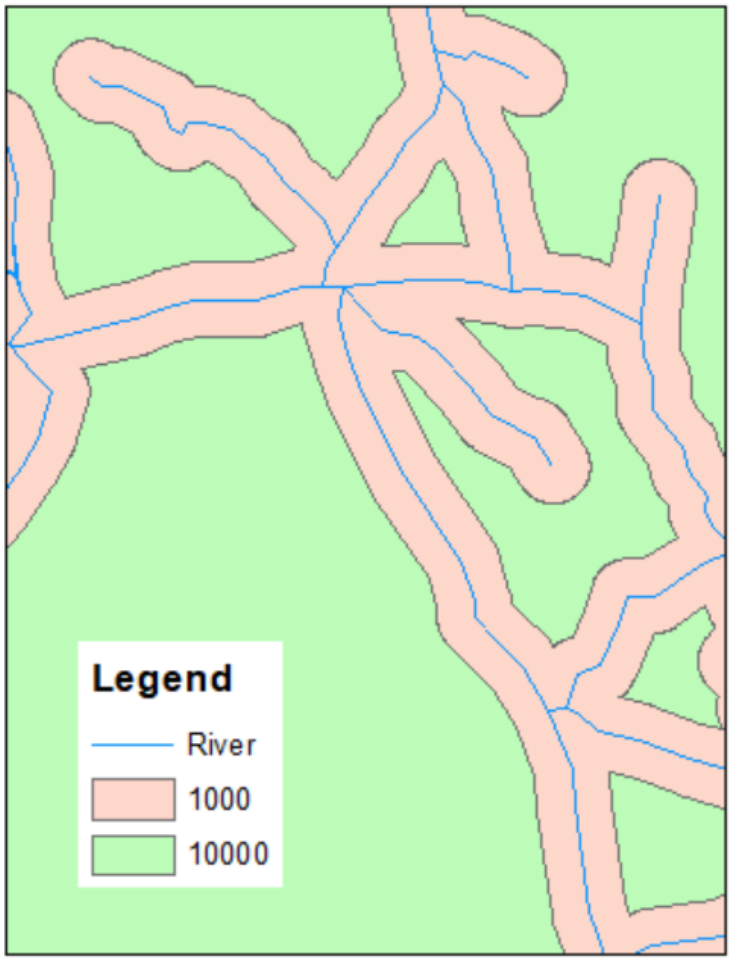
- A number of processes are involved in effectively managing waste for a municipality.
- These include monitoring, collection, transport, processing, recycling and disposal.
- SWM Practices
  - Site Analysis (Synoptic Views)
  - Route optimization
  - Multispectral Capability
  - Fuel Consumption
- The Role of GIS is very large as many aspects of its planning and operations are highly dependent on spatial data & also provides a digital data bank for future monitoring program of the site…….etc

Solid Waste Management: site selection

- Location of dumping site to suitable site for the disposal of urban solid waste generated areas using GIS techniques.
- The principal sub criteria that used for spatial analysis are lithology, geomorphology, slope, drainage, population, distance from major roads, distance from major streams and distance from drainage.

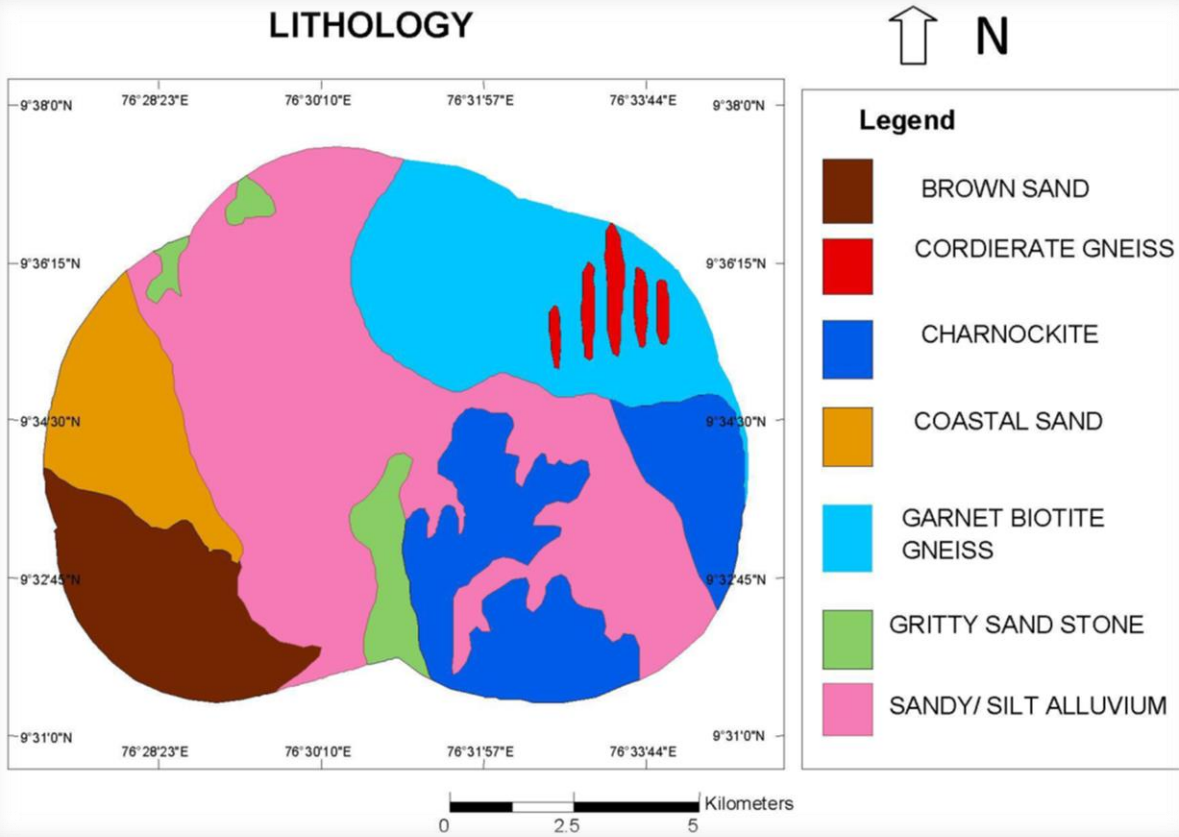
Solid Waste Management: site selection

- With drainage, you may be interested in distance to river or density of the rivers
- For distance to river, you do multiple buffers and classify according to the distance criteria
- If density, you will calculate the density and do the same classification



Solid Waste Management: site selection

- These are qualitative and must be changed to quantitative using rating based on experts or literature
- E.g. Brown sand – 1; cordierite gneiss – 2; etc.
- You can use the same layer more than once



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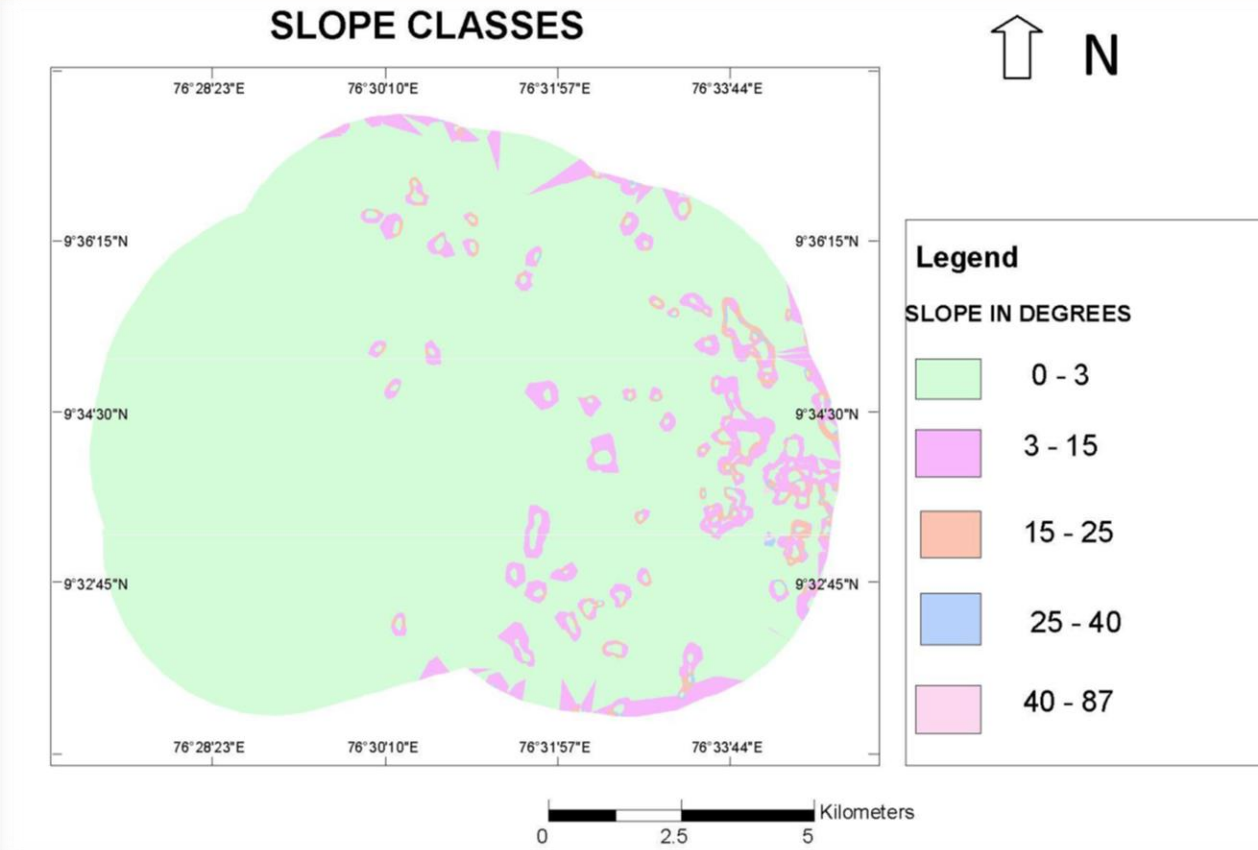
Solid Waste Management: site selection

- Assign values using rating based on experts or literature



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Solid Waste Management: site selection

- Weights have be determine using literature or experts or statistical methods
- Weighting is based on the suitability of these features for site location
- Note that you may require more than these depending on the peculiarity of the area.

Themes	Weightage
Geomorphology	8
Lithology	8
Slope	7
Drainage	6
Stream	6
Population	5
Road	4

Solid Waste Management: site selection

- Composite map
- Normalise the data e.g. suitable (1), not suitable (0) or rescale $\frac{value - min}{\max - min}$

- Combine the datasets using the weights in the previous slide. You will get a map with the correct locations.