

Use of GIS in Soil Survey & Mapping

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What is GIS:-

Geographic Information System (GIS) is a Computer-based systems deals with virtually any type of information about geographic location. It is an Integrated Database Management System in which large volume of georeferenced spatial data derived from field surveys, Aerial surveys, Soils Surveys and space remote sensing are effectively stored, organized, manipulated, retrieved, analysed, displayed, presented as per user's requirement.

Components of GIS:-

There are following components needed for well-developed GIS system to work properly and these are-

- 1. Computer hardware:-** This component includes several specialized peripherals like digitizer, Scanner (converts resource Maps into digital form), a plotter (for graphical representation of Maps) and a visual color graphics display unit on which spatial data editing and displaying can be performed. It is that part of the GIS on which GIS software is run.
- 2. Application software: -** It provides functions and tools for store, analyse, and display geographic information. Major work in GIS is performed by software. A few popular GIS software available in market are- Google Earth Pro, Arc GIS Online, Arc GIS Pro, M aptitude, Map Info Pro, Google Places and many more.
- 3. Data:-** In GIS, data are stored in multiple files. Each file contains data in a coordinate system, defines position for each entry. Data are associated with their geographic features.
- 4. People: -** The person ranges from technically strong ones who design and maintain whole GIS system to those who later use it to perform everyday work.
- 5. Method: -** A successful GIS system operates based on a well-designed plan and rules, which are models and practices unique to each organization.



Advantages of GIS: - Some of the merits of GIS in soil database generation and management are:-

1. Digital database has developed.
2. Date accuracy.
3. Maintains consistency.
4. Easy to update.
5. Large volume of information can be analyzed.
6. Quick data updating retrieval.
7. Map generation is quicker and cheaper process.
8. Visual effects are better.
9. Manpower minimization while map production.
10. Systematic query search.
11. Interactive mapping
12. Create 3D map.
13. Large scale data integration.
14. Modelling is more effective.
15. Compatibility with GPS and SIS Technologies.
16. Different graphical representation.
17. Minimizes time.
18. Cost effective.
19. Generates thematic Maps.
20. Data sharing is more effective.

Application of GIS in soil survey and mapping: -

The GIS software arc info and arc view are used to create soil database attribute data of soils can be depth, texture, pH, drainage, salinity, alkalinity conditions, run off, erosion, nutrient availability etc. Attribute data linked with spatial data hence linking special information with non spatial information from soil model. Through soil models thematic Maps could be easily generated. Sharing and spreading information is easier when information is stored in digital form. Soil survey data can be made use of in the development of agriculture, irrigation purposes, forestry, several engineering purposes and so on. Land capabilities, soil irritability and soil suitability classifications are made based on soil survey interpretation. Based on interpretation potentialities limitations of soils can be obtained and such information are used to construct database using GIS. The soil map is obtained from soil survey report is digitized. A database using arc info in formed. Each Polygon is digitized map represent classes of soil family and soil associations.