

Concept of GIS(Geographical Information System

Geography is the study of Earth's features and patterns of their variations in spatial location and time. Geographical Information Systems or GIS enable representation and integration of such spatial information.

A GIS produces maps and reads maps. Its major advantage is that it permits identifying spatial relationships between specific different map features. It can create maps in different scales, projections and colours. But it is not just a map making tool. It is primarily an analytical tool that provides new ways of looking at, linking and analyzing data by projecting tabular data into maps and integrating data from different, diverse sources. This it does by allowing creation of a set of maps, each with a different theme (soils, rainfall, temperature, relief, water sources,etc.).

A GIS is a computer based tool for geographical analysis of information. It is not simply a digitized map, nor does it hold maps. It holds a database of spatial data and attribute or descriptive information about features on a map which can be used to create desired maps. *The crucial concept of GIS is the separation of spatial or geographic reference information and attribute or descriptive information of map features for data entry and database development, and their linkage during analysis.* Central to both spatial and attribute

information is the database management concept. The separation of the two types of information facilitates entering the spatial information (map) into computers in a digitized form and establishing connectivity (topology) between different stored map features (points, lines and polygons). The feature attribute data is entered independently taking care to introduce an identification variable which is in common with the identification variable for each feature that is common with the spatial database. For geographic analysis, the spatial and attribute data are linked through this unique identifier variable common to the two types of data bases.

Initially, spatial data capture is in spatial units and coordinates of the data capture tool. To translate the map information into real world information of locations, distances and areas these need to be translated to real world units through appropriate transformations of scale and map projections.

The digitized maps and their associated feature attributes are the building blocks of the GIS. The maps can be created and stored in different layers, with each layer containing information about one feature. They can be overlaid over each other to obtain new maps (coverages) with new polygons that are homogeneous with respect to specified feature attributes of maps that were used in the overlays. The overlay operations must be between maps with exact boundary fits. Exact fits are obtained between maps only if they are created in the same projection and scale. To make exact fits, appropriate map projection and scale transformation operations will be needed before geographic analysis can be performed using overlay operations.

