GIS TRAINING

Paramilitary Training

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Presentation Outlines

1. GIS Meaning
2. GIS Components
3. Spatial Data Elements
4. GIS Map Representation

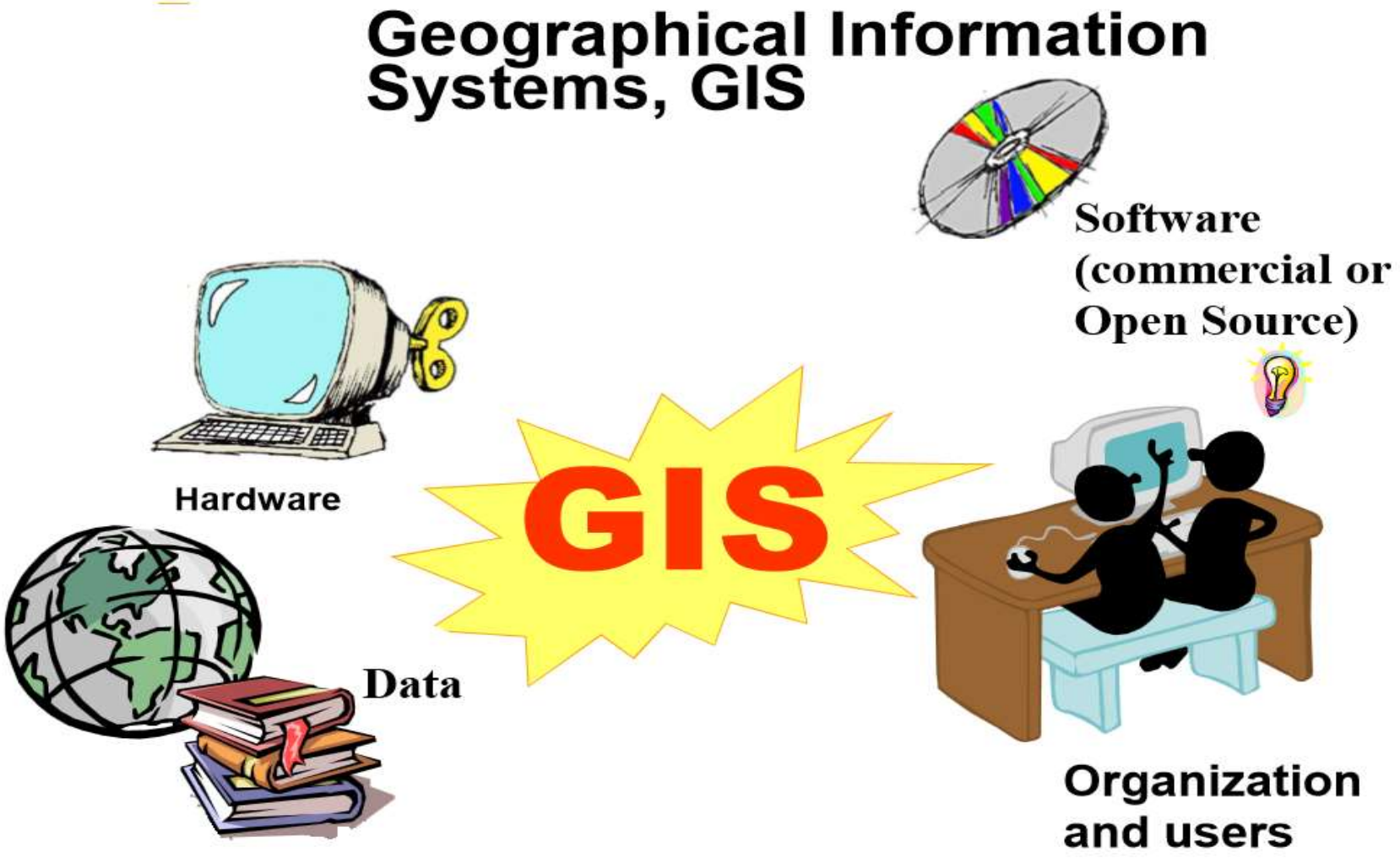
GIS Meaning

- GIS is a computer assisted system for;
  - Acquiring,
  - Storing,
  - Analyzing,
  - Displaying.
- The process of performing these activities involves
  - Hardware,
  - Data,
  - Software,
  - People.
- Therefore broadly GIS comprises of ***hardware, software, data and personnel.***

GIS Data Acquisition

- GIS primary data sources
  - Satellite
  - Global Position System (GPS)
  - Ground surveying
  - Aerial Surveying
- GIS secondary data sources;
  - Scanning
  - Digitization
  - Photogrammetry

GIS meaning cont…



GIS Components

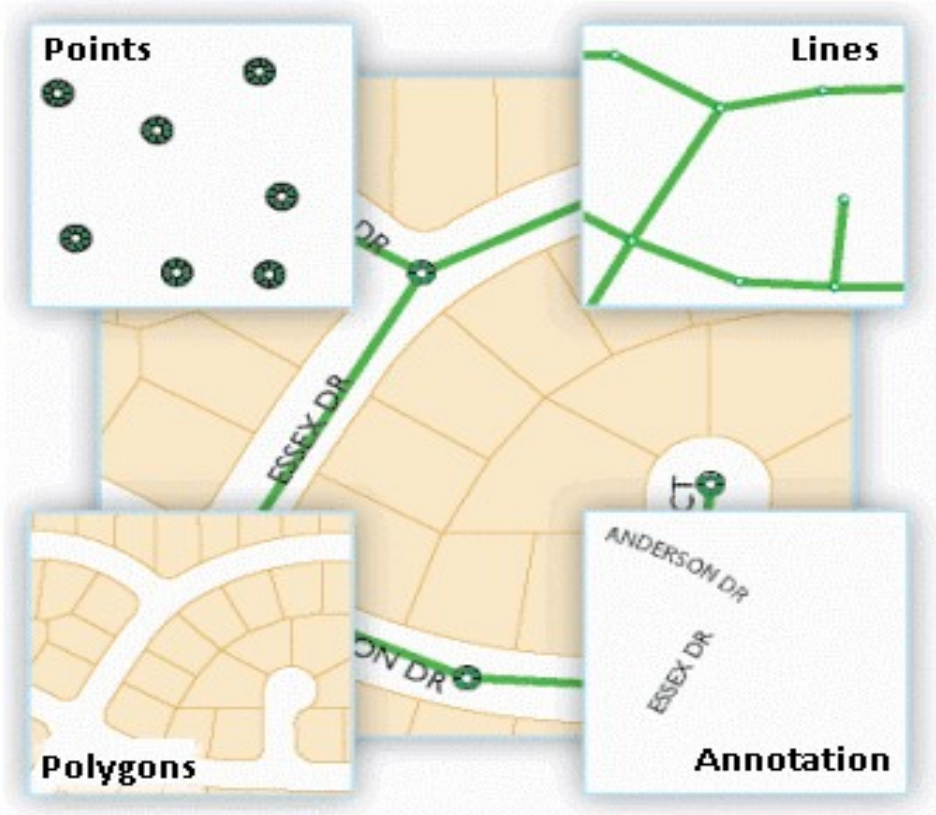
- **Hardware:**
  - A physical device used as part of the system needed to support GIS functions.
  - Computers, Androids, Smart-Phones, Digitizer, GPS, Plotters etc.
- **Software:**
  - An application software or a program which is collection of instructions that together perform GIS tasks.
  - ArcGIS, IDRISI, ERDAS Imagine, ER Mapper Quantum GIS, GRASS etc.

GIS Component cont…

- **Data:**
  - GIS data comprises of graphic and non graphic which are coded and stored in the GIS database.
  - Graphical data are the spatial description of a feature.
  - None graphic data are the attributes , quality or characteristics a feature.
- **Personnel:**
  - Various people who interacts with GIS from various disciplines.
  - Casual users, GIS Managers, Cartographers, GIS technicians, GIS software developer, GIS Programmers, GIS Analysts.

SPATIAL DATA ELEMENTS

- **Spatial Data:** A logical collection of features of a common type (**Feature class**)



GIS MAP REPRESENTATION

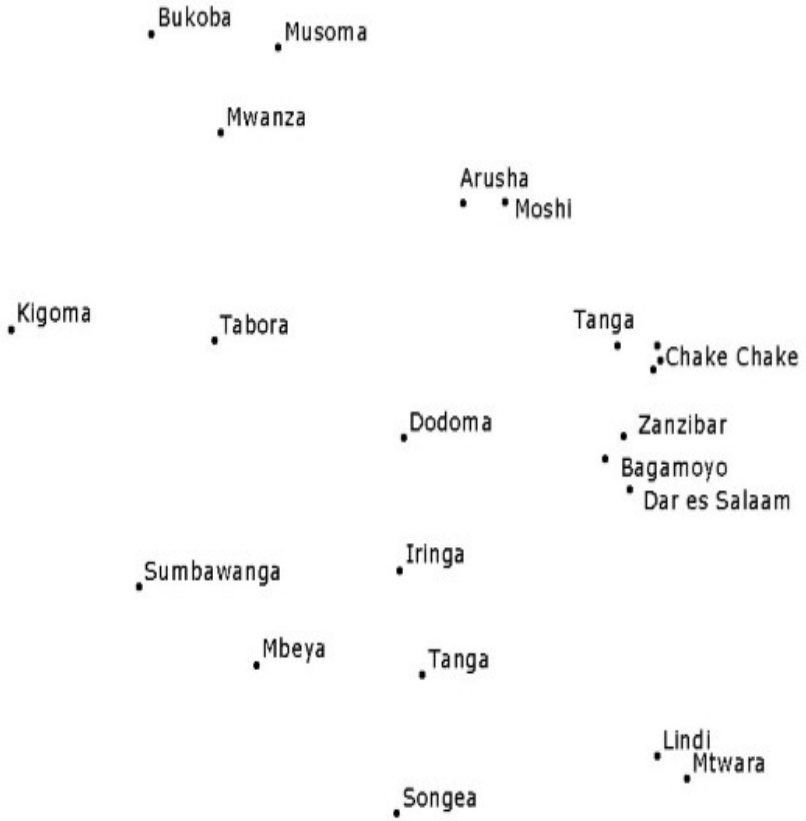
- There are two ways of graphic/spatial data representation ***Vector*** and ***Raster*.**

VECTOR.

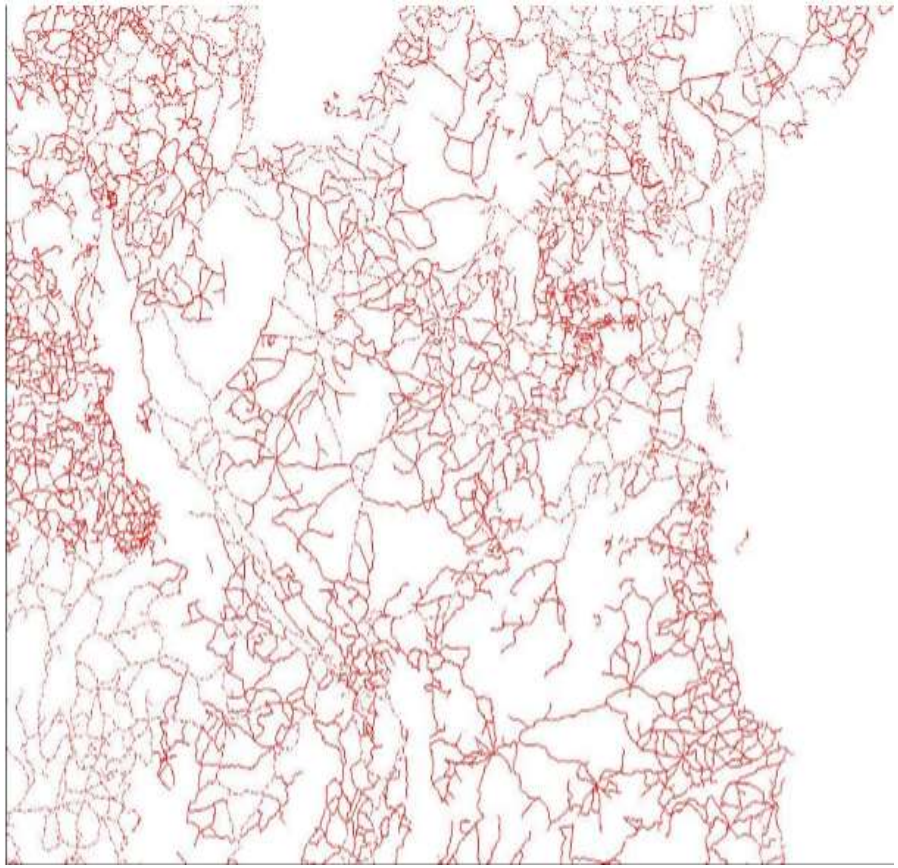
- In vector representation a feature is represented as points, lines, polygons and annotation.
- The course of the features are defined by a series of points that, when joined form a straight line.
- The points themselves are encoded with a pair of numbers giving the X and Y coordinates in systems.

VECTOR REPRESENTATION

URBAN CENTRES POINTS

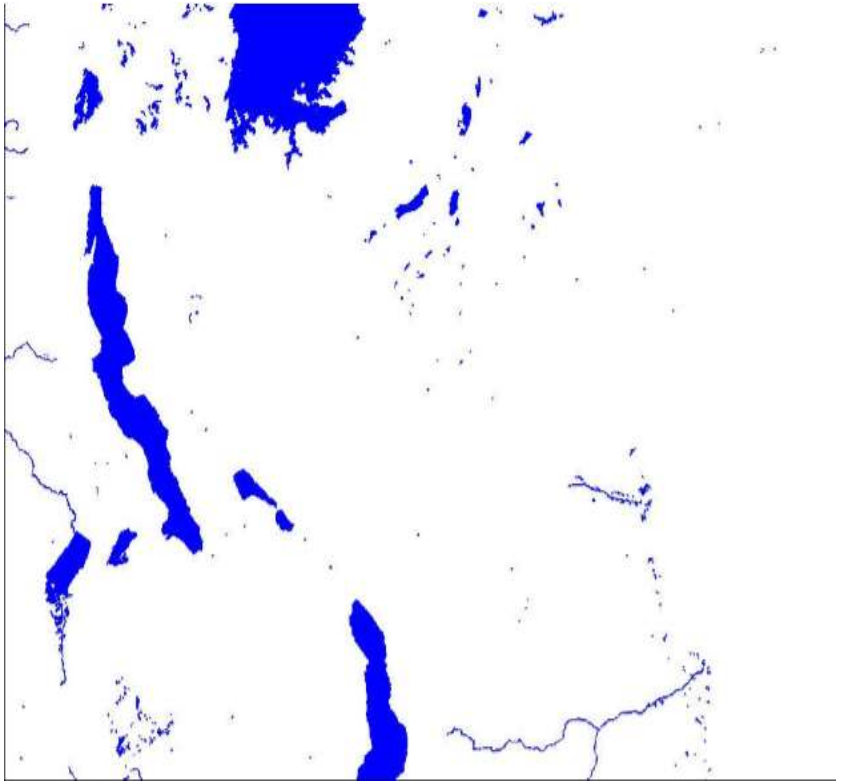


ROADS NETWORK LINES



VECTOR REPRESENTATION

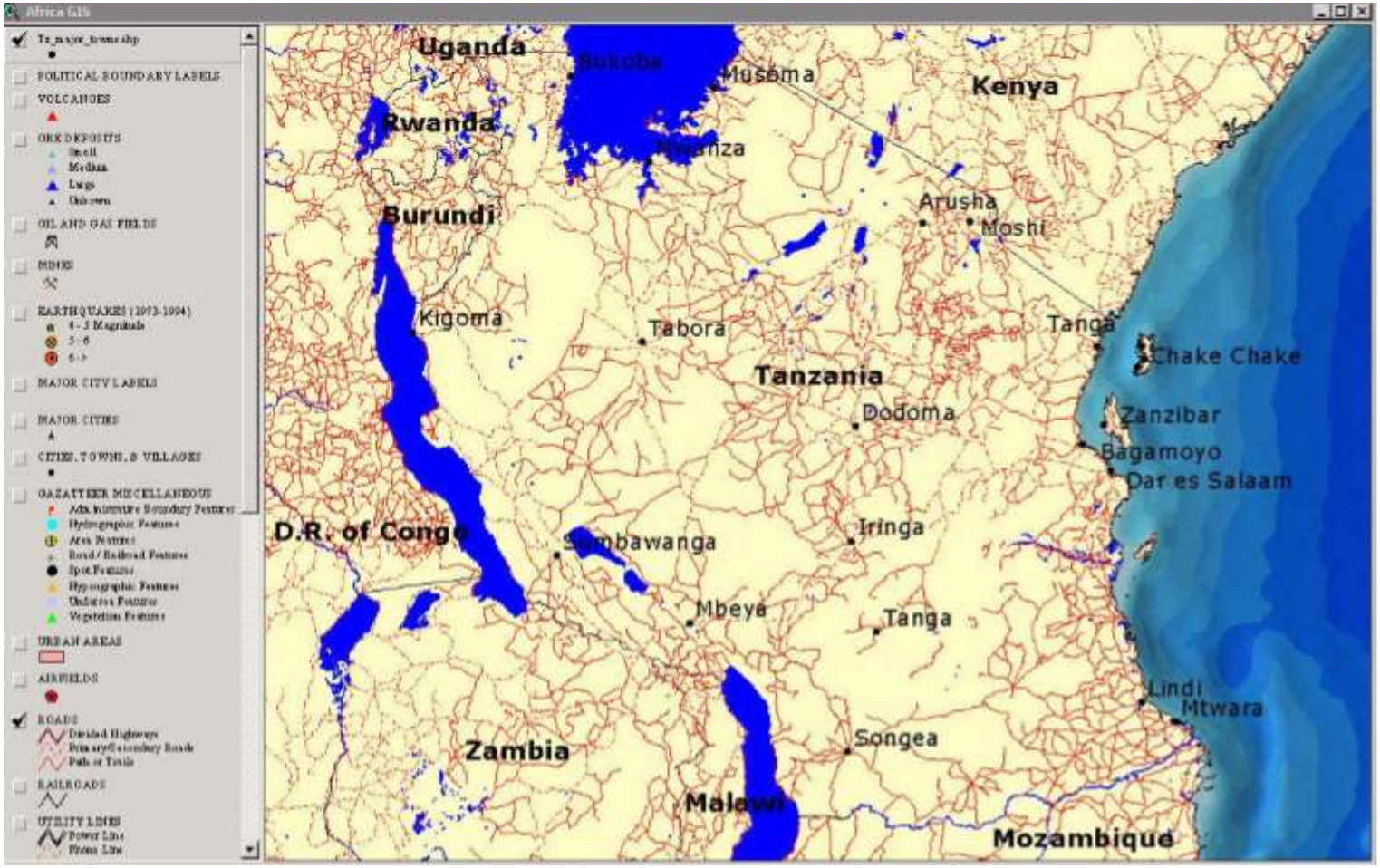
POLYGONS LAKES



POLYGONS COUNTRY BOUNDARY

VECTOR MAP PRESENTATION

POINTS, LINES AND POLYGONS

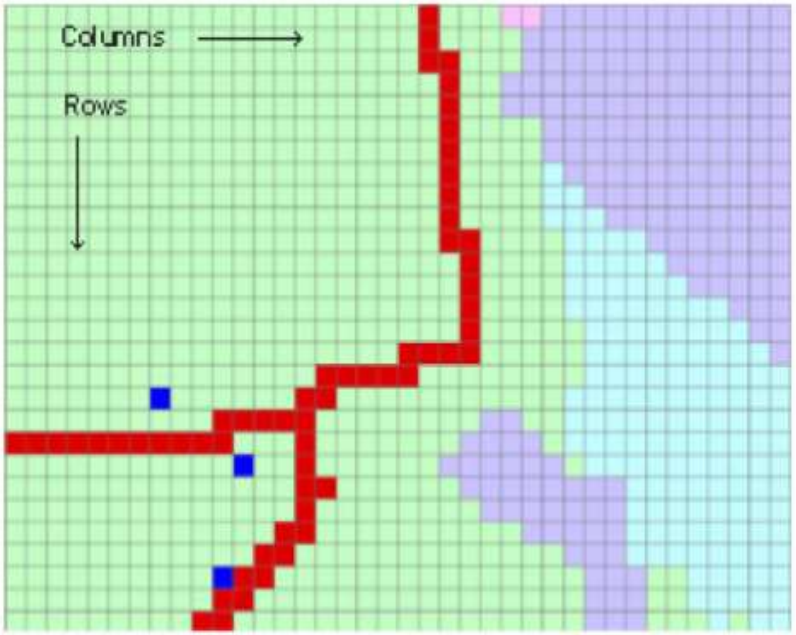


RASTER REPRESENTATION

- Data in the raster format are represented in cells or grids.
- The cells record the condition or attribute of the earth's surface at that point.
- Each cell is given a numeric value which may then represent a feature identifier, a qualitative attribute code or a quantitative attribute value.

VECTOR

RASTER

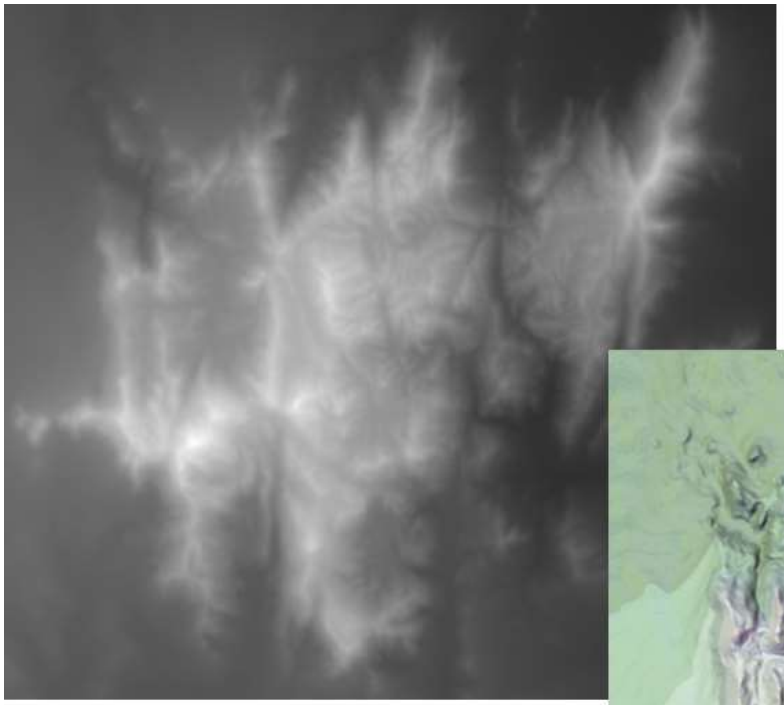


- In the Vector data model, earth features are represented as objects
- Feature Class types are Point, Line, Polygon

- In the Raster data model, earth features are represented as a grid
- Grids consist of equal-sized cells or pixels with numerical values
- Grid cell size = spatial resolution which defines the raster scale

RASTER MAP REPRESENTATION

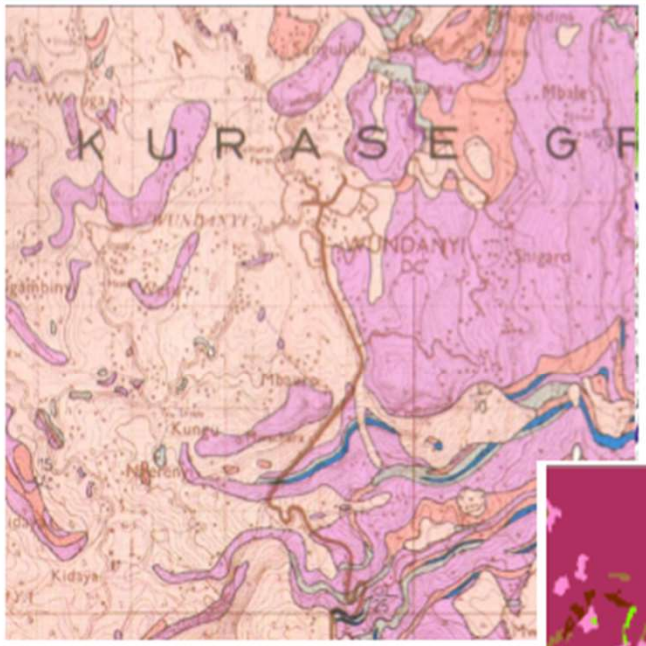
Examples of different Raster data



Digital Elevation Model

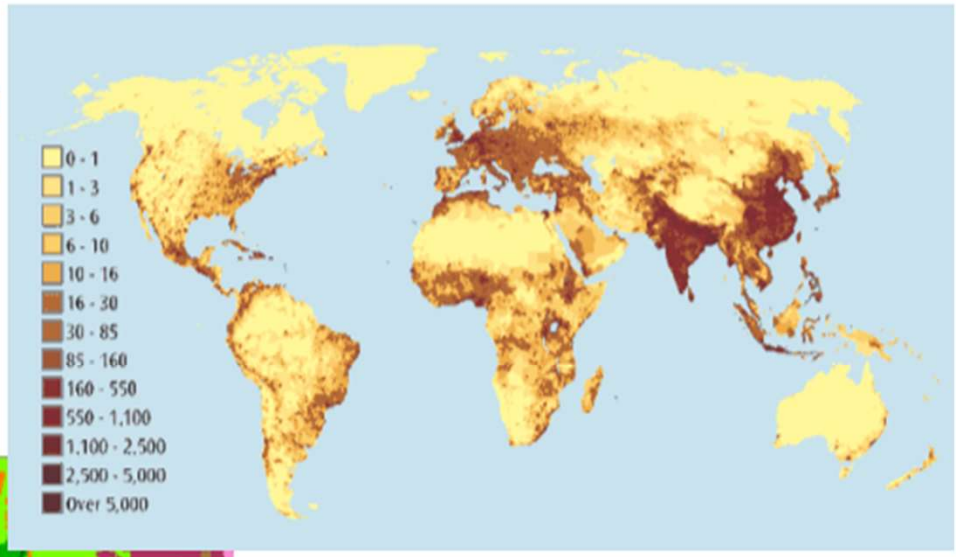
Hill shade

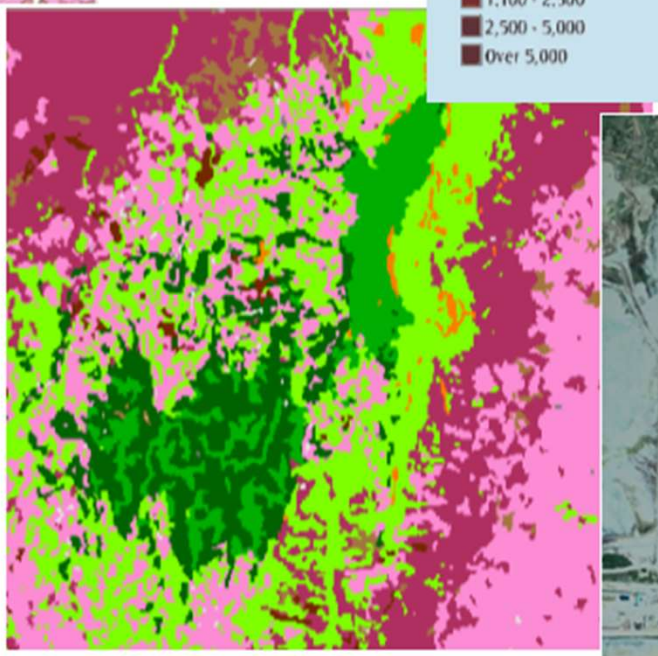
RASTER MAP REPRESENTATION



Geological Map

Population density





Land cover

Asanteni sana

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