Nature and Source of Data lec-1

Dr. Supriya

Assistant Professor (Guest)

Department of Geography

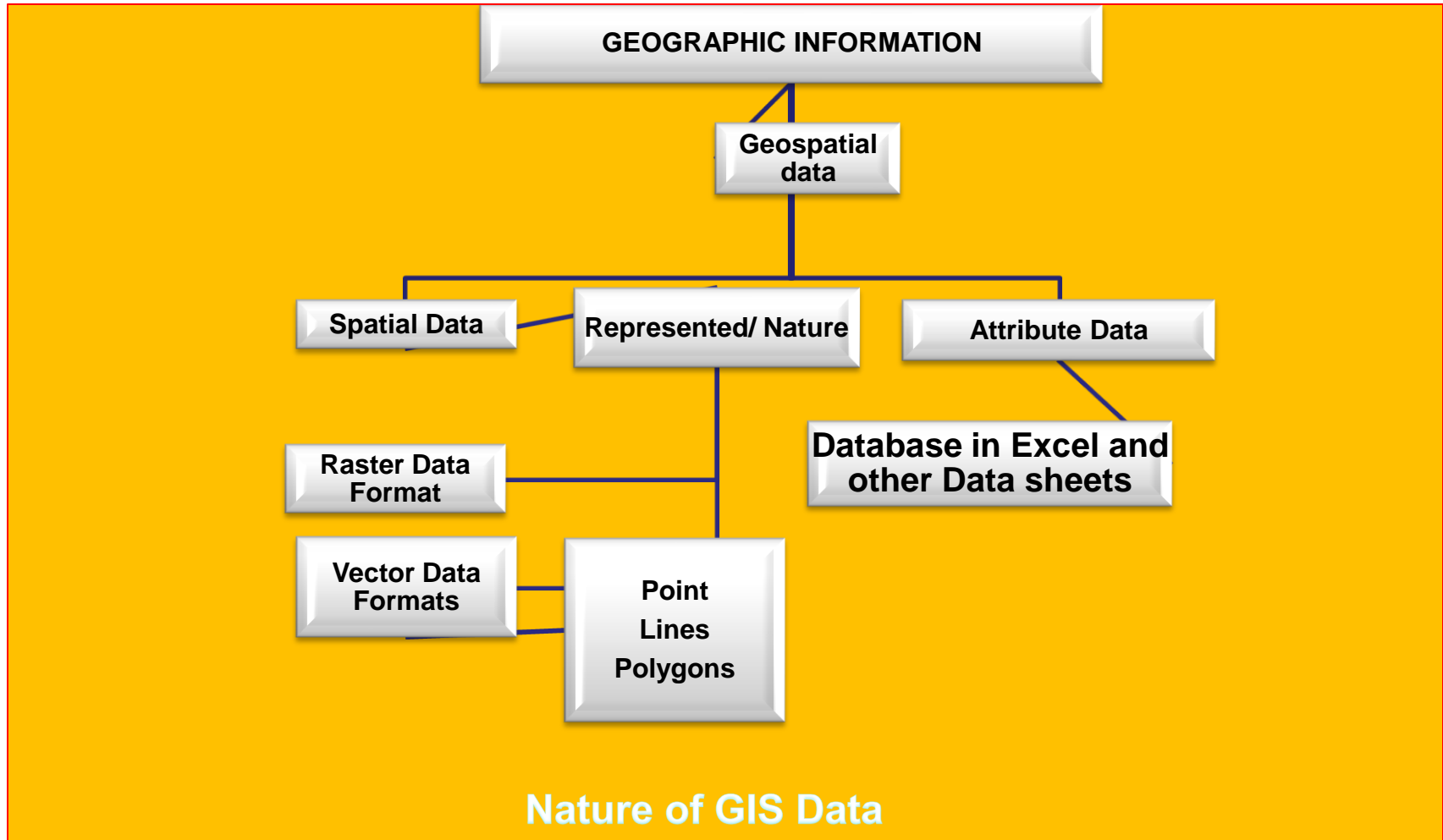*Patna University, Patna*

CONTENTS

➢ Introduction

➢ Nature of Gis Data

➢ Spatial vs Attribute Data

  ➢ Spatial Data
  ➢ Raster & Vector Data
      ➢ Raster Data Formats
      ➢ Vector Data Formats

  ➢ Attribute Data

➢ Must Read

➢ Model Questions

INTRODUCTION

❑ Geographic Information System is defined as an information system that is used to input, store, retrieve, manipulate, analyze and produce geographically referenced data

❑ Geospatial data supports decision making for Planning and management of

- Land use

- Natural resources

- Environment

- Transport & communication

- Urban facilities

- Other administrative records

NATURE OF GIS DATA

Nature of GIS Data
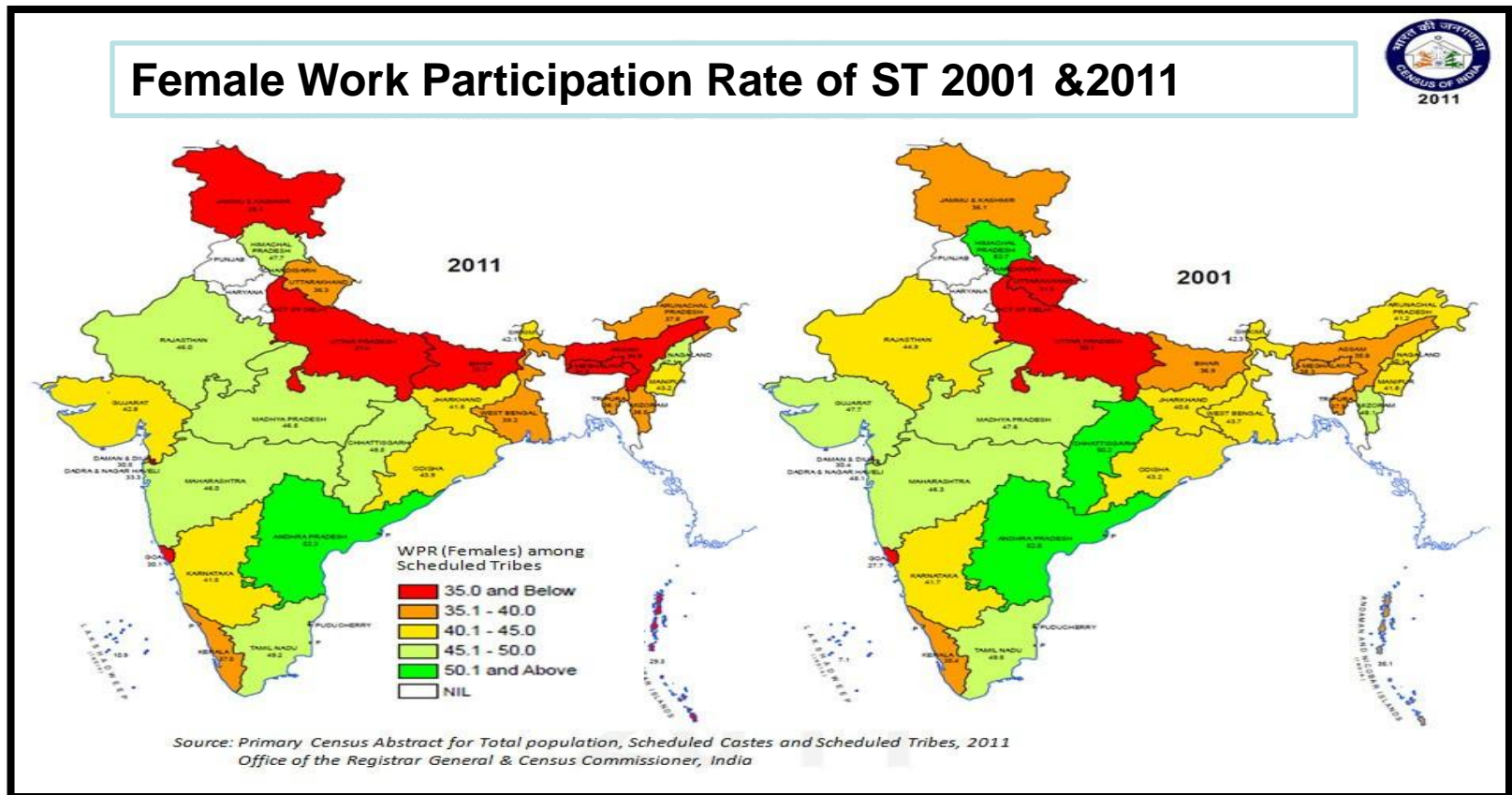
Boreholes

Hydrology

Climate

Landform

Landcover

➢**Spatial Data : Deals with Two elements**

1. Absolute localization of Entity: based on coordinate System
2. Topological Relationship: Other observation

(Spatial vs Attribute)

GIS deals with Geospatial Data:-

Geographical Location of India

1. **Spatial Information/ Data:** related to the earth or space by coordinates, address or other means.
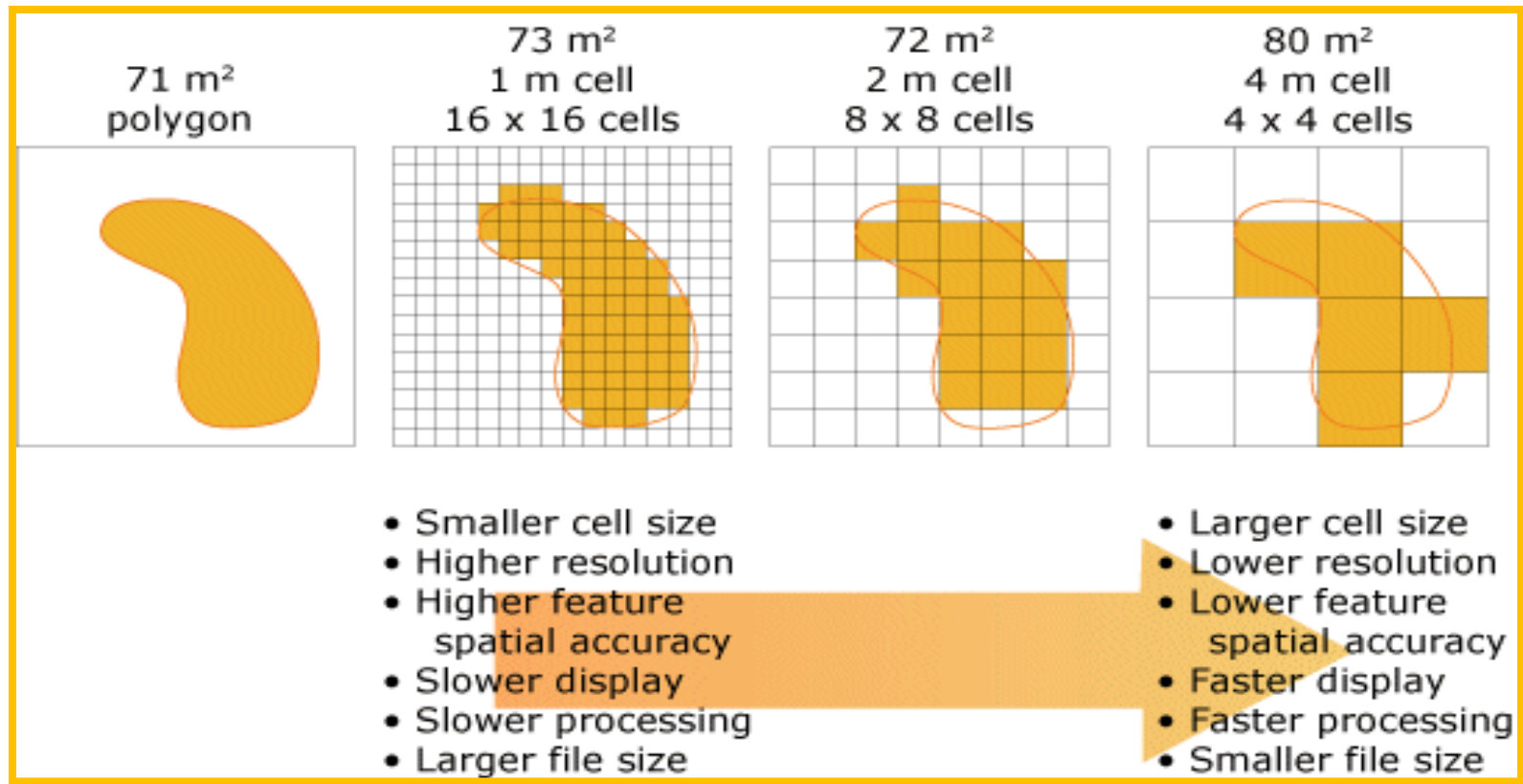
ex. The graphical representation of Coordinates

2. Attribute Information/ Non-Spatial Data: Properties and characteristics of the spatial features; Ex: Female Work participation rate of India

Female Work Participation Rate of ST 2001 &2011

Source: Primary Census Abstract for Total population, Scheduled Castes and Scheduled Tribes, 2011
Office of the Registrar General & Census Commissioner, India

Spatial Data: Raster vs Vector

Raster data represents a graphic object as a pattern of dots, whereas vector data represents the object as a set of lines drawn between specific points.

71 m² polygon

73 m² — 1 m cell — 16 x 16 cells

72 m² — 2 m cell — 8 x 8 cells

80 m² — 4 m cell — 4 x 4 cells

- Smaller cell size
- Higher resolution
- Higher feature spatial accuracy
- Slower display
- Slower processing
- Larger file size

- Larger cell size
- Lower resolution
- Lower feature spatial accuracy
- Faster display
- Faster processing
- Smaller file size

Spatial Data: Raster vs Vector

❑ **Raster Data Format :** Raster file represent the image by subdividing the paper into a matrix of small rectangles called cells. Each cell is assigned a position in the data file and given a value based on the attribute at that position. Its row and column co- ordinates may identify any individual pixel. Generic structure for a grid.

❑ **Raster Resolution**

• **The relationship between cell size and the number of cells is expressed as the resolution of the raster Data.**

• **A finer resolution gives a more accurate and better quality image.**

Spatial Data: Raster vs Vector

❑ Vector Data Format: A vector representation of the same diagonal line would record the position of the line by simply recording the coordinates of its starting and ending points. The vector data model is based around the storage of coordinate pairs.
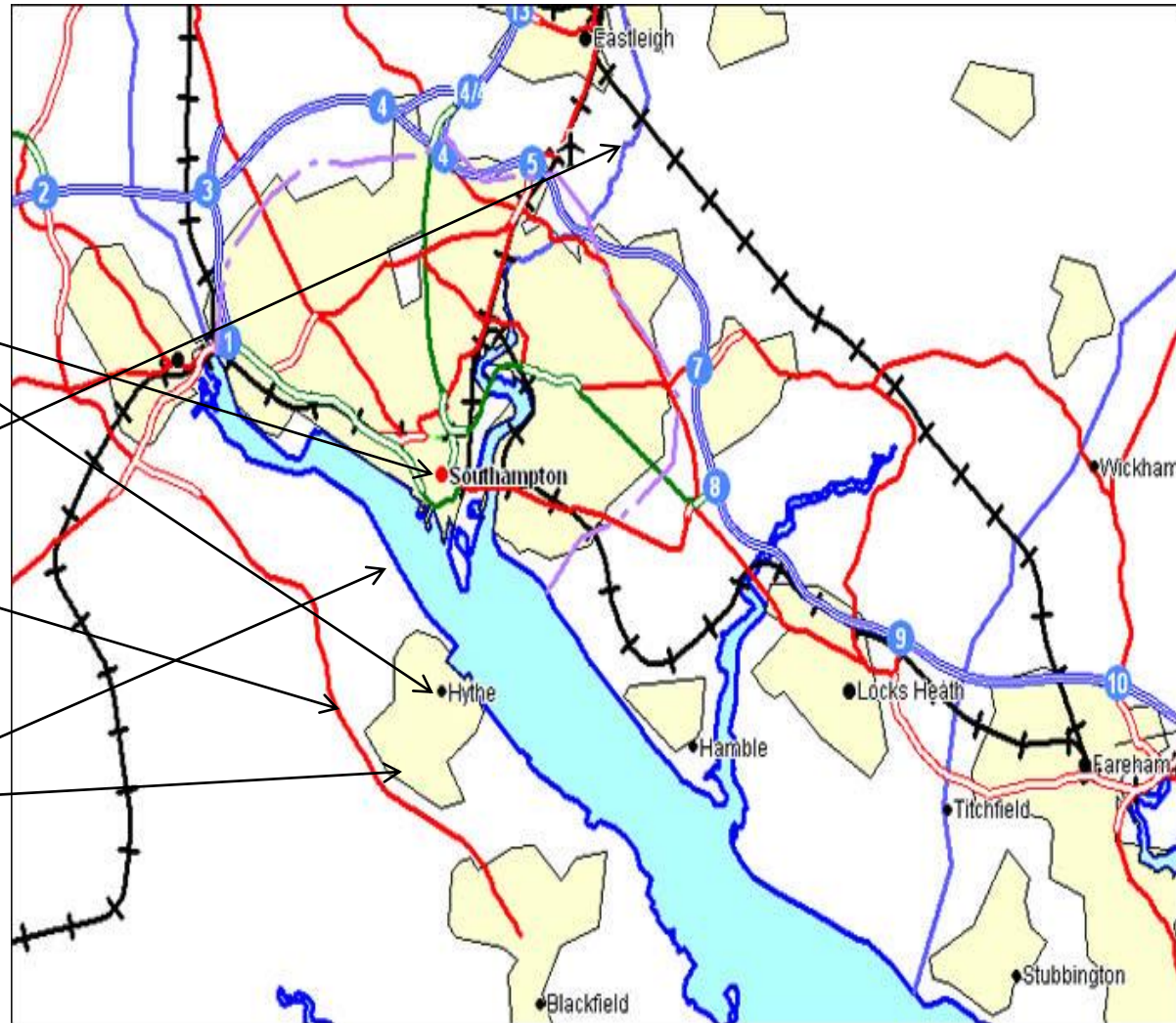
▪ Point
▪ Line
▪ Polygon

Vector Data

- **Point**
- **Line**
- **Polygon**

Spatial Data: Raster vs Vector

❑ Raster file are most **often** used:

✓ For digital representations of aerial photographs, satellite images, scanned paper maps, and other applications with very detailed images.

✓ When costs need to be kept down.

✓ When the map does not require analysis of individual map features.

✓ When 'backdrop' maps are required.

❑ Vector files are most often used:

✓ Highly precise applications.

✓ When file sizes are important.

✓ When individual map features require analysis.

✓ When descriptive information must be stored.

Attribute Data

- ✓ Attribute information is the basis of geographic features, allowing you to visualize, query, and analyze your data. In the simplest terms, tables are made up of rows and columns, and all

- ✓ In ArcGIS, rows are known as records and columns are fields. Each field can store a specific type of data, such as a number, date, or piece of text. rows have the same columns.

- ✓ Feature classes are really just tables with special fields that contain information about the geometry of the features Which include the Shape field for point, line, and polygon feature classes and the BLOB field for annotation feature classes.

- ✓ Some fields, such as the unique identifier number (Object ID) and Shape, are automatically added, populated, and maintained by ArcGIS.

Suggested Readings

MUST READ

- Albert , C.P.Lo. & Yeung. K.W., (2007) Concept and techniques of Geographic information system ; PHI Learning PVT Ltd. New Delhi

- Burrough,P.A. and McDonnell, R.A., (1998) : Principles of Geographic Information Systems, Oxford University Press, Oxford. De Mers, Michael N., (1999) : Fundamentals of Geographic Information Systems, John Wiley & Sons, NewYork.

- Fraser Taylor, D. R. (1991): Geographical Information System, London.

- DevidattChauniyal, Sudoor Samvedanevam Bhaugolik Soochna Pranali.

- Heywood, I. et al. (2004) : An Introduction to Geographic Information Systems, Pearson Education.

- Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W., (2001), Geographic Information Systems and Science, Wiley, Chichester.

- Siddiqui, An Introduction to Geographical Information System.

Model Questions

Q1. "GIS deals with spatial and attribute data." Examine the statement.

Q2. Write a brief account on nature of data in GIS.

Q2. Write short notes on them:

a) Nature of data in GIS

b) Spatial data

c) Attribute data

d) Raster data

e) Vector data

Contact me:
Mob/ WA: 9006640841
Emai:supriyavatsa52256@gmail.com
Webpage: http://bhuvankosh.com