

Quadrant II– Transcript and related material

Programme : S.Y.B.A./S.Y.B.Sc.

Subject : Geography

Paper Code : GES 108

Paper Title : Application of GIS in Geography

Unit: II : Coordinate System

Module Name : Georeferencing

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➤ Georeferencing:

There is a great deal of geographic data available in formats that can not be immediately integrated with other GIS data. In order to use these types of data in GIS it is necessary to align it with existing geographically referenced data, this process is also called georeferencing. Georeferencing is also a necessary step in the digitizing process. Digitizing in GIS is the process of “tracing”, in a geographically correct way, information from images/maps. The process of georeferencing relies on the coordination of points on the scanned image (data to be georeferenced) with points on a geographically referenced data (data to which the image will be georeferenced). By “linking” points on the image with those same locations in the geographically referenced data you will create a polynomial transformation that converts the location of the entire image to the correct geographic location. We can call the linked points on each data layer control points.

The importance of Georeferencing lies in its ability to turn non-spatial imagery into spatial raster data for use in a variety of circumstances. Spatial data like scanned map, toposheets, aerial photo and satellite images are used to give spatial reference with respect to the its 'X' (Longitude) and 'Y'(Latitude) coordinates gives in GIS platform.

The geo referencing of spatial data can be done through two main methods. Firstly, you can use 3D coordinates in which the center of earth serves as the point of origin of all 3 axes. It is a popular method for scientific applications but it is not considered feasible for applying to the points on earth's surface.

The second method is the projection of the points. In this method, 3D coordinates are expressed as a plane with some height above them. This technique helps in flattening the curved area of a small region into a flat surface for referencing purposes. The plane coordinates point towards a particular point within the projection. It is measured in terms of distances, north and east from the origin.

❖ **Stages of Georeferencing in QGIS 3.16.3:**

- 1. Open QGIS 3.16 software**
- 2. Import the Map/Toposheet in QGIS Georeference window**
- 3. Insert the X (Longitude) and Y (Latitude) coordinates to the map**
- 4. Select the Projection System, Save output location and Run it**
- 5. Open the Georeferenced map/toposheets and check it.**

❖ **Link to the get hands-on practice video of georeferencing:**

- 1. <https://www.youtube.com/watch?v=DkoFqnt8Ct0&t=6s>**
- 2. <https://www.youtube.com/watch?v=jKLBfddpTGI>**
- 3. <https://www.youtube.com/watch?v=9LokWQzg3ho>**
- 4. <https://www.youtube.com/watch?v=m12ZXpGBoDc>**

5. <https://www.youtube.com/watch?v=dt9JMdNB2x4&t=4s>

❖ **Manual Links for Georeferencing in QGIS :**

1. https://docs.qgis.org/2.14/en/docs/training_manual/

2. https://docs.qgis.org/3.16/en/docs/training_manual/index.html

3. <https://freegistutorial.com/qgis-tutorial-beginners/>

4. <http://www.refugeeinfoturkey.org/repo/Toolkit/CapacityBuilding/GIS/02+-+Step+by+Step+QGIS.pdf>

5. <https://www.igismap.com/introduction-of-qgis-3-2-1-for-beginners/>