

Assignment 9

Aim: Convert a raster map to a vector layer and a vector layer to a raster using QGIS.

Understanding Raster to Vector Conversion

What is Raster Data?

Raster data is a way of representing geographic information using a grid of pixels. Each pixel holds a specific value that defines a particular attribute of the area it represents.

What is Vectorization?

Vectorization is the process of transforming raster data into vector data. Unlike raster data, vector data represents geographic features using points, lines, and polygons.

Tools in QGIS for Raster-to-Vector Conversion

QGIS provides multiple tools for converting raster data into vector format, including:

- **Raster to Vector (GDAL)** – Uses the Geospatial Data Abstraction Library (GDAL) to convert raster data into vector format.
- **Polygonize (GDAL)** – Converts raster data into polygon features.
- **Lines to Polygons** – Converts line features into polygon features.

Steps to Convert Raster to Vector in QGIS

1. Open QGIS and load the raster layer.
 2. Navigate to **Raster > Conversion > Raster to Vector (GDAL)**.
 3. Select the input raster layer and specify the output vector format (e.g., Shapefile, GeoJSON).
 4. Click **Run** to execute the conversion.
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Understanding Vector to Raster Conversion

What is Vector Data?

Vector data is used to represent geographic features such as points, lines, and polygons. It provides precise details about locations and boundaries.

What is Rasterization?

Rasterization is the process of converting vector data into raster format. In this process, vector features are mapped onto a grid of pixels, where each pixel is assigned a specific value.

Tools in QGIS for Vector-to-Raster Conversion

QGIS offers several tools to perform this conversion, including:

- **Vector to Raster (GDAL)** – Uses GDAL to transform vector data into raster format.
- **Polygon to Raster** – Converts polygon features into raster data.

Steps to Convert Vector to Raster in QGIS

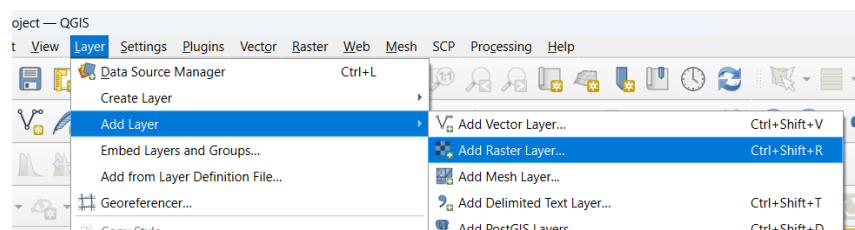
1. Open QGIS and load the vector layer.
2. Navigate to **Vector > Data Management Tools > Vector to Raster (GDAL)**.
3. Select the input vector layer and specify the output raster format (e.g., GeoTIFF, JPEG).
4. Adjust the resolution and extent as needed.
5. Click **Run** to complete the conversion.

Result:

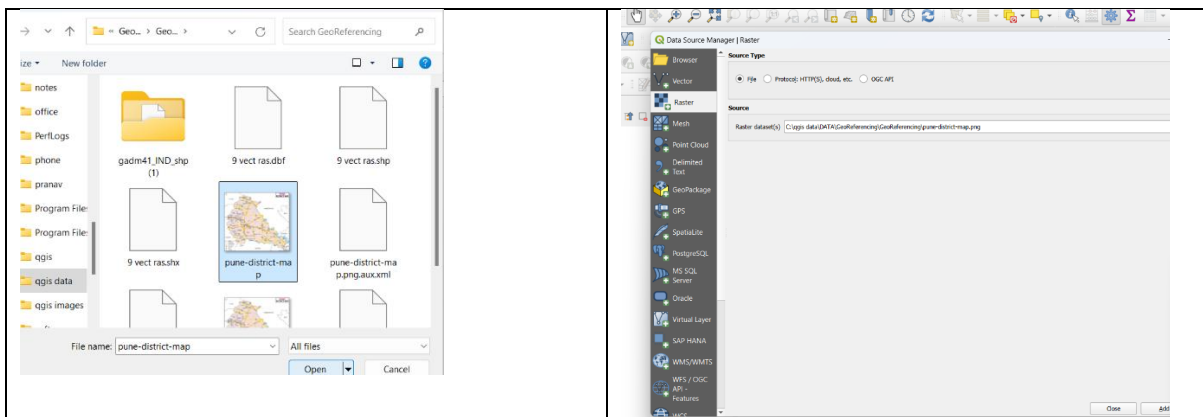
Step 1: open QGIS



Step 2: select add layer and raster layer



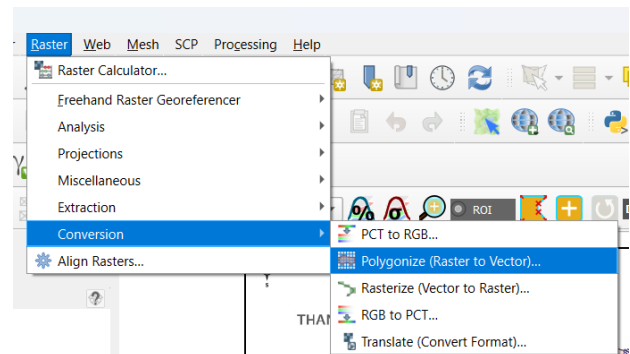
Step 3: select the raster data and add Raster data



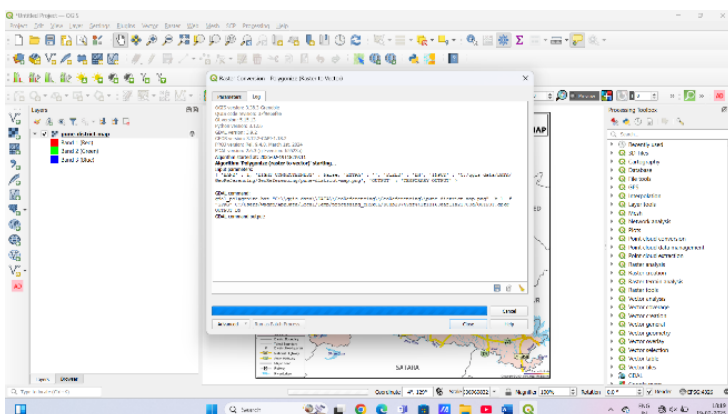
Step 4: open raster file



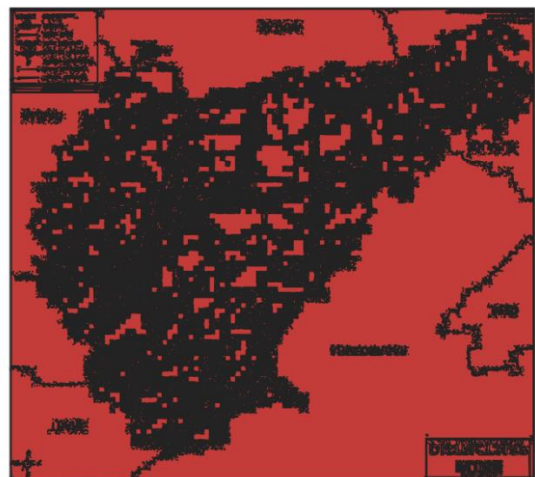
Step 5 select the conversion and raster to vector



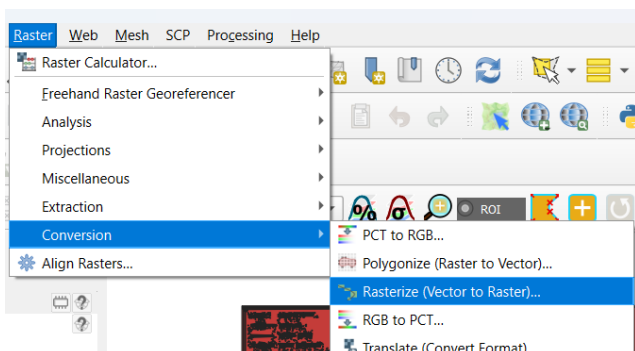
Step 6: convert the raster data into vector



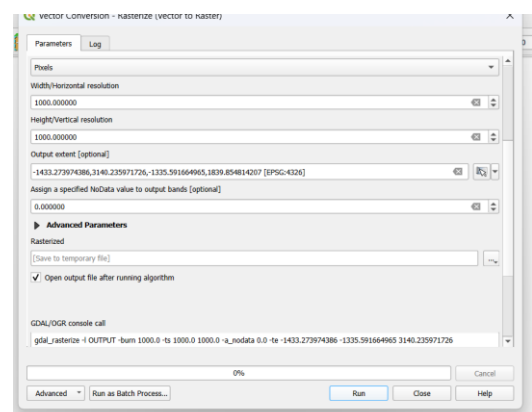
Step 7: result after converting raster file into vector



Step 8: convert the vector file into raster



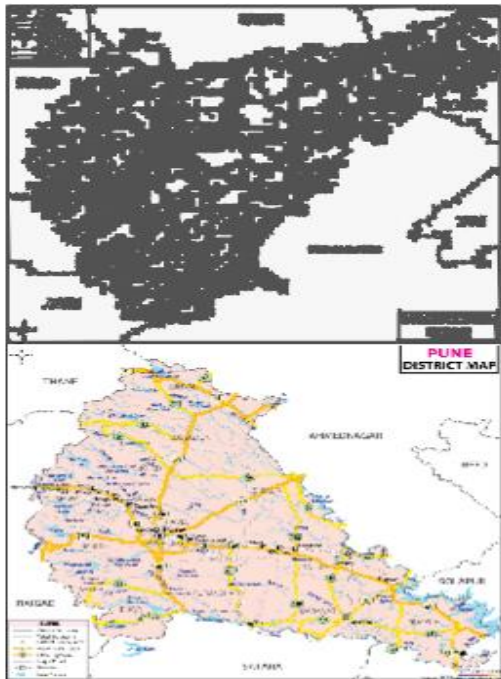
Step 9: give the values for raster conversion



Step 10: result after converting vector image into raster



Step 11: final result of raster to vector



step 12: final result of vector to raster

