

First Day 15th December,2023
Time:2:30-3:45 pm

HANDS ON EXCERSISE IN QGIS

Topic

1. Georeferencing

2. Digitization

By

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Global Solution Group Pvt. Ltd.

First Day 15th December,2023

Time:2:30-3:45 pm

HANDS ON EXCERSISE

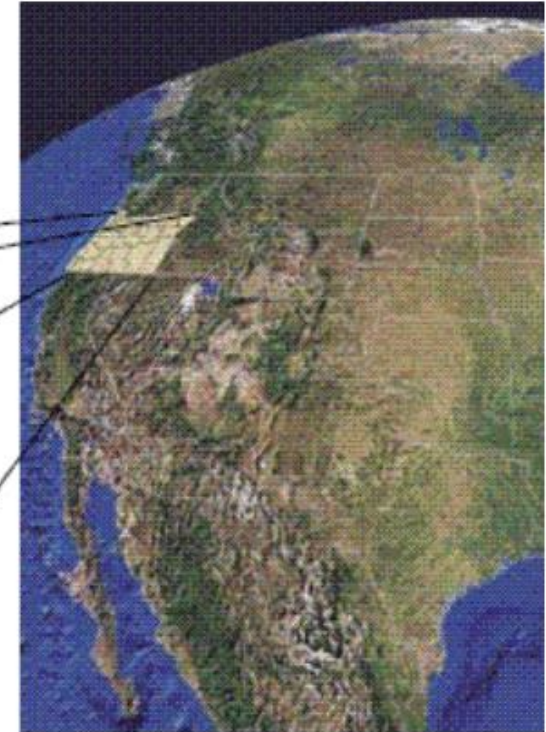
1. Georeferencing of Map (Topographic Sheet)

2. Digitization

Meaning of Georeferencing ?

Georeferencing ?

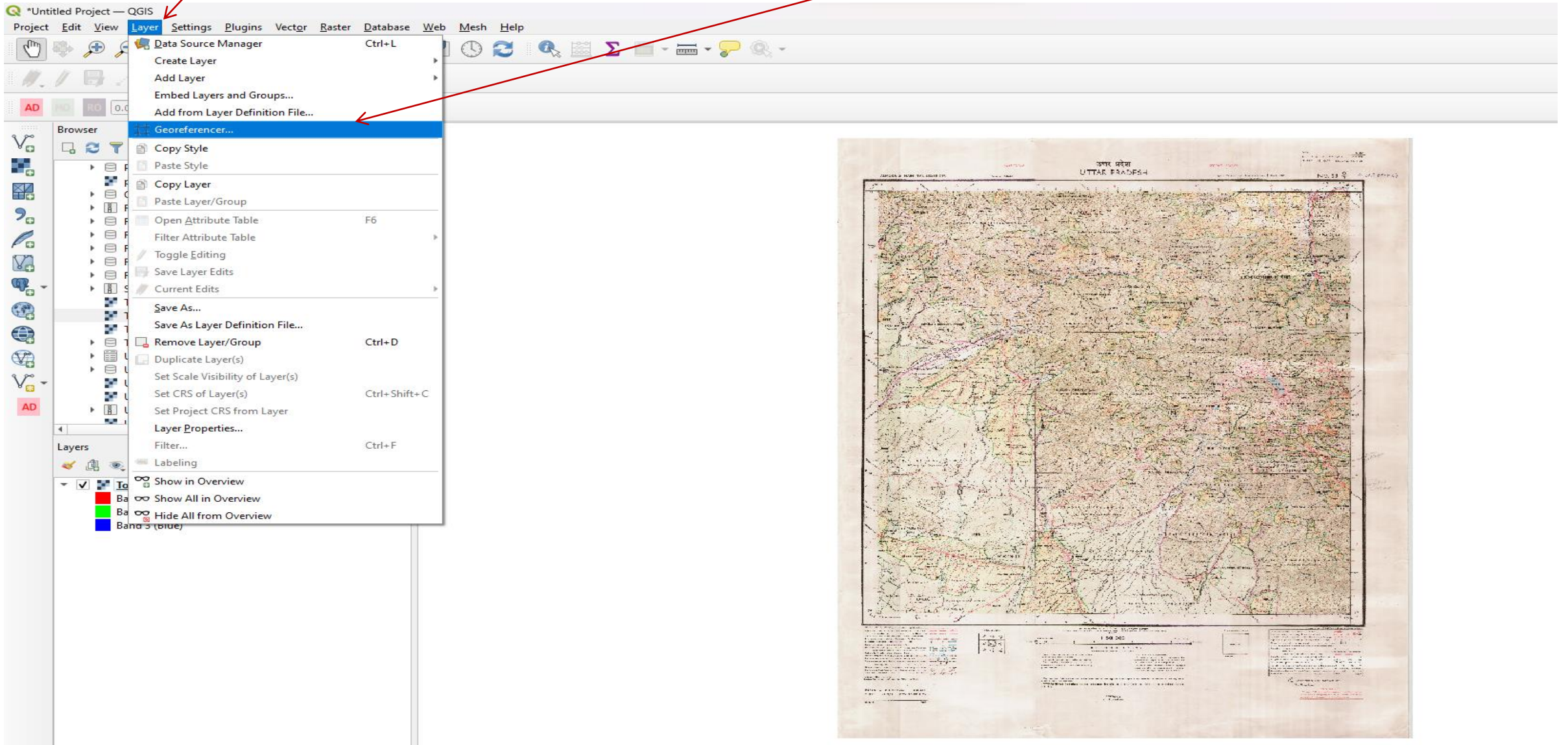
**Where is the
location of the
Area Under
Reference
on
Earths Projection
(Coordinate System) ?**



Select Toposheet to be Georeferenced

The screenshot displays the QGIS desktop application. The top menu bar includes Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, and Help. Below the menu is a toolbar with various icons for navigation and editing. The left sidebar contains a 'Browser' panel and a 'Layers' panel. In the 'Browser' panel, a file named 'Toposheet.jpg' is selected, indicated by a red arrow pointing from the title above. The 'Layers' panel shows the 'Toposheet' layer with three bands: Band 1 (Red), Band 2 (Green), and Band 3 (Blue). The main canvas displays a topographic map of Uttarakhand, India, with a grid overlay. The map title is 'उत्तर प्रदेश UTTAR PRADESH'. The status bar at the bottom shows the coordinate system as EPSG:4326, a scale of 943012224, and a magnification of 100%.

Select Module- 4 and Click on Georeference



The screenshot displays the QGIS software interface. The 'Layer' menu is open, and the 'Georeference...' option is highlighted. The interface includes a menu bar with options like Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, and Help. Below the menu bar is a toolbar with various icons. On the left side, there is a 'Browser' panel and a 'Layers' panel. The 'Layers' panel shows a list of layers with checkboxes and labels. The main area of the software is currently blank, but a historical map is shown on the right side of the image, which is the subject of the georeferencing process.

The historical map on the right is a detailed topographic map of a region in Uttar Pradesh, India. It features a grid, roads, rivers, and various geographical features. The map is titled 'UTTAR PRADESH' and includes a scale bar and other technical details at the bottom.

Select File Menu and Click on Open Raster

The screenshot shows the QGIS Georeferencer window. The 'File' menu is open, and the 'Open Raster...' option is highlighted. The background shows the QGIS main interface with the Browser and Layers panels visible.

Georeferencer File Menu:

- File
- Edit
- View
- Settings
- Reset Georeferencer
- Open Raster... (Ctrl+O)**
- Open Vector...
- Start Georeferencing (Ctrl+G)
- Generate GDAL Script (Ctrl+C)
- Load GCP Points... (Ctrl+L)
- Save GCP Points as... (Ctrl+S)
- Close Georeferencer (Ctrl+Q)

Browser Panel:

- Pan Card.pdf
- pdf2doc.zip
- QGIS-3.22-DesktopUserGuide-en.pdf
- RE_Discussion.zip
- Relieving and experience.pdf
- Resume-VarunRawat (1).pdf
- Resume-VarunRawat (2).pdf
- Resume-VarunRawat.pdf
- Resume.pdf
- ShareDigitalExclusion.zip
- Toposheet (1).jpg
- Toposheet.jpg
- Toposheet.jpg.ovr
- TORGIS.pdf
- Untitled spreadsheet - Sheet1.csv
- Updated_Resume-VarunRawat.pdf
- UTTARAKHAND_ASPECT (1).bmp
- UTTARAKHAND_ASPECT.bmp
- Uttarakhand_Block_Boundary.zip
- UTTARAKHAND_SLOPE (1).bmp

Layers Panel:

- Toposheet
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)

GCP table:

Enabled	ID	Source X	Source Y	Dest. X	Dest. Y	dX (pixels)	dY (pixels)	Residual (pixels)
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Open raster: Rotation: 0.0 °, Transform: Not set, 168,0, EPSG:

Select Add Point (First)to be Georeferenced

The screenshot displays the QGIS software interface. The main window shows a topographic map titled "Georeferencer - Toposheet.jpg". The map features contour lines, a grid, and text including "ALMORA & NAINI TĀL DISTRICTS." and "GANGIKHARAK RESERVED FOREST". A red arrow points to the "Add Point" button in the Georeferencer toolbar. The "GCP table" at the bottom is empty. The status bar at the bottom shows the coordinate as -59°, 124°, a scale of 943012224, and a magnifier of 100%.

Browser

- Pan Card.pdf
- pdf2doc.zip
- QGIS-3.22-DesktopUserGuide-en.pdf
- RE_Discussion.zip
- Relieving and experience.pdf
- Resume-VarunRawat (1).pdf
- Resume-VarunRawat (2).pdf
- Resume-VarunRawat.pdf
- Resume.pdf
- ShareDigitalExclusion.zip
- Toposheet (1).jpg
- Toposheet.jpg
- Toposheet.jpg.ovr
- TORGIS.pdf
- Untitled spreadsheet - Sheet1.csv
- Updated_Resume-VarunRawat.pdf
- UTTARAKHAND_ASPECT (1).bmp
- UTTARAKHAND_ASPECT.bmp
- Uttarakhand_Block_Boundary.zip
- UTTARAKHAND_GLOBE (1).bmp

Layers

- Toposheet
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)

GCP table

Enabled	ID	Source X	Source Y	Dest. X	Dest. Y	dX (pixels)	dY (pixels)	Residual (pixels)
---------	----	----------	----------	---------	---------	-------------	-------------	-------------------

Add point

Rotation: 0.0 ° Transform: Not set 94,-267 None

Coordinate: -59°, 124° Scale: 943012224 Magnifier: 100% Rotation: 0.0 ° Render: EPSG:4326

Enter Coordinates of First Point: 79 15 00 & 29 30 00

The screenshot shows the QGIS interface with the Georeferencer window open. The 'Enter Map Coordinates' dialog box is displayed over the map canvas, which shows a topographic map of Uttarakhand. The dialog box contains the following information:

- Instructions: Enter X and Y coordinates (DMS (dd mm ss.ss), DD (dd.dd) or projected coordinates (mmmm.mmm)) which correspond with the selected point on the image. Alternatively, click the button with icon of a pencil and then click a corresponding point on map canvas of QGIS to fill in coordinates of that point.
- X / East: 79 15 00
- Y / North: 29 30 00
- CRS: EPSG:4326 - WGS 84
- Automatically hide georeferencer window

The map canvas shows a topographic map with contour lines and labels such as 'Kharak Reserved Forest', 'Raturi Kharak', and 'Kando 5 km'. A red arrow points from the text above to the 'X / East' field in the dialog box.

At the bottom of the QGIS window, the status bar shows: Coordinate 69°, 167°, Scale 943012224, Magnifier 100%, Rotation 0.0°, Render, and EPSG:4326.

Select Second Point to be Georeferenced:

The screenshot shows the QGIS interface with a project titled '*Untitled Project - QGIS'. The main window displays a topographic map of Ranikhet, India, with a scanned image overlaid. The scanned image has handwritten text: 'East in 1985.', 'No. 53 $\frac{0}{7}$ ', and 'R-34 (DMMC)'. A red arrow points to a specific location on the map. A dialog box titled 'Enter Map Coordinates' is open, prompting the user to enter X and Y coordinates (DMS or projected) for the selected point. The dialog box also shows the coordinate system as EPSG:4326 - WGS 84 and a checked option for 'Automatically hide georeferencer window'. The 'From Map Canvas' button is highlighted.

Georeferencer - Toposheet.jpg

File Edit View Settings

Enter Map Coordinates

Enter X and Y coordinates (DMS (*dd mm ss.ss*), DD (*dd.dd*) or projected coordinates (*mmmm.mm*)) which correspond with the selected point on the image. Alternatively, click the button with icon of a pencil and then click a corresponding point on map canvas of QGIS to fill in coordinates of that point.

X / East

Y / North

EPSG:4326 - WGS 84

Automatically hide georeferencer window

OK Cancel

Rotation 0.0° Transform: Linear Translation (79.2288, 2)

Coordinate 30.686°, 81.227° Scale 1:956330 Magnifier 100% Render EPSG:4326

Browser

- Map Service UK Varun
- QGIS 3.32.0
- Shape Files
 - 1 District wise .shp Files
 - UK State level Shape Files
 - Administrative
 - State_Boundary.shp
 - State_Boundary.zip
 - Uttarakhand_Block_Boundaries.shp
 - Uttarakhand_Block_Boundaries.zip
 - Uttarakhand_District_Boundaries.shp
 - Uttarakhand_District_Boundaries.zip
 - Uttarakhand_Tehsil_Boundaries.shp
 - Uttarakhand_Tehsil_Boundaries.zip
 - Aspect
 - Climatic Regions
 - Department of Revenue
 - Department of Urban Development
 - Disaster Management

Layers

- Uttarakhand_Major_Rivers
- State_Boundary
- Uttarakhand_District_Boundary
- Toposheet_georeferenced
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)
- OpenStreetMap

GCP table

Enabled	ID	Source X	Source Y	Dest. X	Dest. Y	dX (pixels)	dY (pixels)	Residual (pixels)
---------	----	----------	----------	---------	---------	-------------	-------------	-------------------

Enter Coordinates of Second Point: 79 30 00 & 29 15 00

The screenshot displays the QGIS Georeferencer interface. The main window shows a topographic map titled "Georeferencer - Toposheet.jpg" with a grid overlay. The map includes labels such as "East in 1985", "No. 53 $\frac{0}{7}$ ", "R-34 (DMMC)", "RĀNĪKHET", "Majhera", "Kujraoli", "Nauna", "KOSI R.", "Chhara", "Wooden bridge", "Byansi", "Bisni", "Doba", "Aquaduct", "Iron Bridge", "Police Chauki", "RH (Forest)", "Khairna", "BM 900.7", "RĀNĪKHET 24 km", "Almora 31 km", and "1500". The map is overlaid with a grid showing coordinates 79° 30' and 29° 30'.

The "Enter Map Coordinates" dialog box is open, showing the following fields:

- X / East: 79 30 00
- Y / North: 29 15 00
- EPSG: 4326 - WGS 84
- Automatically hide georeferencer window

The dialog box has buttons for "OK", "From Map Canvas", and "Cancel".

At the bottom of the QGIS interface, the status bar shows: Coordinate: 28.938°, 80.055° Scale: 1:956330 Magnifier: 100% Rotation: 0.0° Render: EPSG:4326

Enter Coordinates of Third Point: 79 30 00 & 29 15 00

The screenshot displays the QGIS Georeferencer interface. The main window shows a topographic map titled "Georeferencer - Toposheet.jpg" with a grid overlay. The map features contour lines and a grid with coordinates. A red dot marks a specific point on the map, with red arrows pointing from the text above to the input fields in the "Enter Map Coordinates" dialog box.

The "Enter Map Coordinates" dialog box is open, showing the following fields:

- X / East: 79 30 00
- Y / North: 29 15 00
- EPSG: 4326 - WGS 84
- Automatically hide georeferencer window

The dialog box also includes "OK", "From Map Canvas", and "Cancel" buttons.

The map shows a grid with coordinates: 79° 30' 15" and 29°. The text "PRINTED AT THE IO(H.L.O.) PRINTING GROUP OF SURVEY OF INDIA." is visible at the bottom of the map.

The QGIS interface includes a Browser panel on the left showing a project structure with folders like "Map Service UK Varun", "QGIS 3.32.0", and "Shape Files". The Layers panel at the bottom left shows a list of layers, including "Uttarakhand Major Rivers", "State_Boundary", "Uttarakhand District_Boundary", "Toposheet_georeferenced", and "OpenStreetMap".

The status bar at the bottom of the QGIS window displays the following information: Coordinate 27.618°, 80.617°, Scale 1:976281, Magnifier 100%, Rotation 0.0°, Render, and EPSG:4326.

Select Fourth Point to be Georeferenced:

The screenshot shows the QGIS Georeferencer window with a topographic map of Kamola R F. A red arrow points to a point on the map. The 'Enter Map Coordinates' dialog box is open, and the 'GCP table' is visible at the bottom.

Enter Map Coordinates

Enter X and Y coordinates (DMS (*dd mm ss.ss*), DD (*dd.dd*) or projected coordinates (*mmmm.mm*)) which correspond with the selected point on the image. Alternatively, click the button with icon of a pencil and then click a corresponding point on map canvas of QGIS to fill in coordinates of that point.

X / East

Y / North

EPSG:4326 - WGS 84

Automatically hide georeferencer window

OK From Map Canvas Cancel

GCP table

Enabled	ID	Source X	Source Y	Dest. X	Dest. Y	dX (pixels)	dY (pixels)	Residual (pixels)

Rotation: 0.0 ° Transform: Linear Translation

Coordinate: 26.353°, 79.575° Scale: 1:995144 Magnifier: 100% Rotation: 0.0 ° Render EPSG:4326

Enter Coordinates of Fourth Point: 79 15 00 & 29 15 00

The screenshot displays the QGIS Georeferencer interface. The main window shows a toposheet being georeferenced. A dialog box titled "Enter Map Coordinates" is open, allowing the user to input coordinates for a selected point on the map. The dialog box contains the following information:

- Enter X and Y coordinates (DMS (*dd mm ss.ss*), DD (*dd.dd*) or projected coordinates (*mmmm.mm*)) which correspond with the selected point on the image. Alternatively, click the button with icon of a pencil and then click a corresponding point on map canvas of QGIS to fill in coordinates of that point.
- X / East: 79 15 00
- Y / North: 29 15 00
- EPSG:4326 - WGS 84
- Automatically hide georeferencer window

The dialog box also features "OK", "From Map Canvas", and "Cancel" buttons. The background map shows a toposheet with a grid and handwritten text including "KAMOLA R F", "29° 15' 79° 15' E. of", and "REG. No. 9301-101 D 8". The QGIS interface includes a Browser panel on the left showing a project structure with various shapefiles and a Layers panel at the bottom left showing the georeferenced toposheet and other layers like "Uttarakhand Major Rivers", "State_Boundary", "Uttarakhand District_Boundary", "Toposheet_georeferenced", "Band 1 (Red)", "Band 2 (Green)", "Band 3 (Blue)", and "OpenStreetMap". The status bar at the bottom shows the current coordinate as 26.36°, 79.651°, a scale of 1:995144, a magnifier of 100%, a rotation of 0.0°, and the EPSG:4326 projection.

Now all Coordinates of all 4 Points have been Registered

The screenshot displays the QGIS Georeferencer interface. The main window shows a topographic map with four red dots marking Ground Control Points (GCPs). The GCP table at the bottom provides the following data:

Enabled	ID	Source X	Source Y	Dest. X	Dest. Y	dX (pixels)	dY (pixels)	Residual (pixels)
<input checked="" type="checkbox"/>	0	323.229963	-544.126554	79.250000	29.500000	-3.008750	4.208915	5.173736
<input checked="" type="checkbox"/>	1	4138.0611	-552.576551	79.500000	29.500000	2.892041	-4.241082	5.133291
<input checked="" type="checkbox"/>	2	317.221551	-4901.1488	79.250000	29.250000	2.999661	7.246027	7.842377
<input checked="" type="checkbox"/>	3	4143.8361	-4915.6087	79.500000	29.250000	-2.882953	-7.213861	7.768604

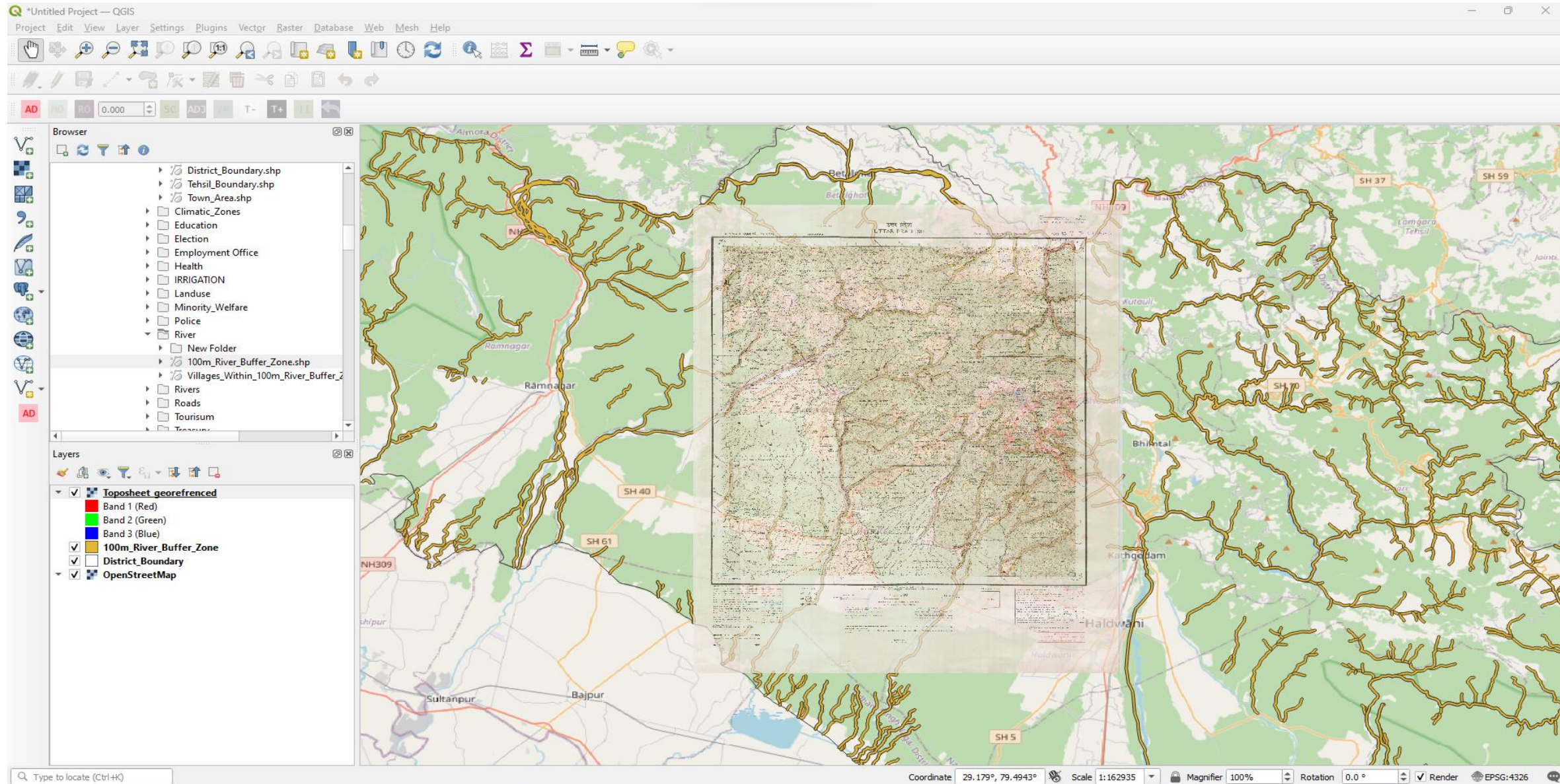
At the bottom of the Georeferencer window, the status bar shows: Rotation: 0.0°, Transform: Linear Translation (79.229, 29.5314) Scale (6.54325e-05, 5.73387e-05) Rotation: 0 Mean error: 9.3534 381,-6012 None. The main QGIS interface shows a project titled "Untitled Project - QGIS" with a file browser on the left containing various documents and a layers panel on the right showing the "Toposheet" layer with three bands: Band 1 (Red), Band 2 (Green), and Band 3 (Blue).

Open Uttarakhand State Boundary with District Boundaries

The screenshot displays the QGIS interface with the following components:

- Browser Panel:** Shows a tree view of files. Under 'Shape Files' > 'UK State level Shape Files' > 'Administrative', the following files are listed:
 - State_Boundary.shp
 - State_Boundary.zip
 - Uttarakhand_Block_Boundary.shp
 - Uttarakhand_Block_Boundary.zip
 - Uttarakhand_District_Boundary.shp
 - Uttarakhand_District_Boundary.zip
 - Uttarakhand_Tehsil_Boundary.shp
 - Uttarakhand_Tehsil_Boundary.zip
- Layers Panel:** Shows the loaded layers:
 - Uttarakhand_Major_Rivers
 - State_Boundary
 - Uttarakhand_District_Boundary
 - Toposheet_georeferenced
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)
 - OpenStreetMap
- Map Canvas:** Displays the map of Uttarakhand with a network of brown lines representing major rivers. The state boundary is shown as a thick black line, and district boundaries are shown as thin black lines. A georeferenced topographic map is overlaid in the southern part of the state.
- Status Bar:** Shows the current coordinate as 29.088°, 79.452°, a scale of 1:956764, a magnifier of 100%, a rotation of 0.0°, and the EPSG:4326 projection.

Open OSM Map



First Day 15th December,2023

Time:2:30-3:45 pm

HANDS ON EXCERSISE

1. Georeferencing of Image -Similarly Satellite Image can be Georeferenced by getting coordinate of 4 points through GPS or Toposheet/Google Map.

2. Digitization

First Day 15th December,2023

Time:4.00 -5.00 pm

HANDS ON EXCERSISE

1. Georeferencing

2. Digitization

Meaning of Digitization

- **Digitization is the conversion of analog maps into digital maps.**

TYPES OF GIS DATA LAYERS:

- 1. Point Data Layer (Features) –Hadpump,Tree,Building. Village etc.**
- 2. Line Data Layers (Features) –Road, Canal, River, Railway Line etc..**
- 3. Polygon Data Layer (Feature) –Village Boundary, Forest Area, Block ,Tehsil,District etc.**

1. Digitization of Point Data Layer (Feature)

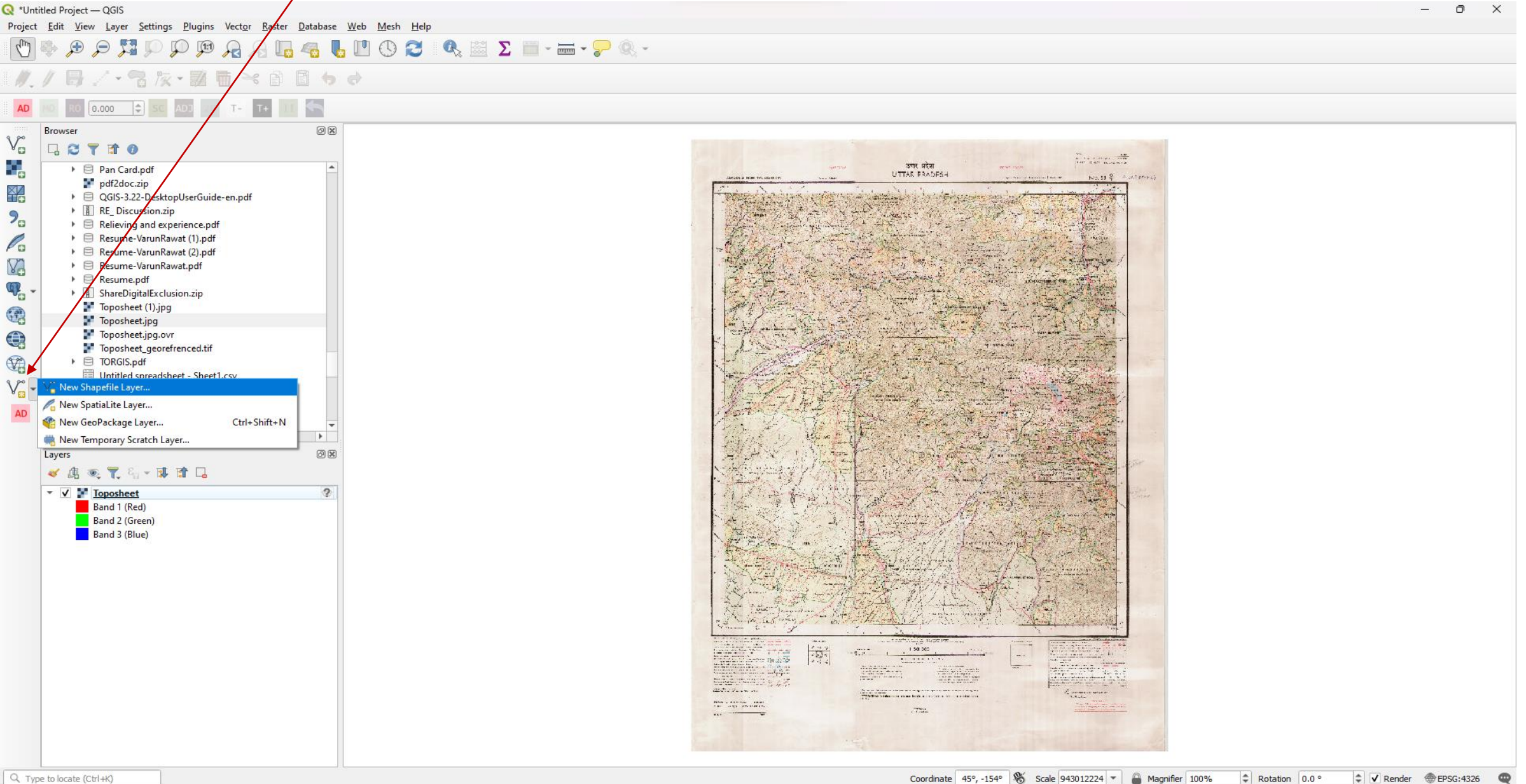
Example

Village Location

Open Map (Toposheet) to Create shape File

The screenshot displays the QGIS desktop environment. The main window is titled '*Untitled Project — QGIS'. The interface includes a menu bar (Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, Help), a toolbar with various tool icons, and a status bar at the bottom. On the left side, there are two panels: 'Browser' and 'Layers'. The 'Browser' panel shows a file tree with several files, including 'Toposheet (1).jpg', which is highlighted by a red arrow. The 'Layers' panel shows the 'Toposheet' layer with three bands: Band 1 (Red), Band 2 (Green), and Band 3 (Blue). The main canvas displays a topographic map (toposheet) of a region in Uttarakhand, India, with a grid and various geographical features. The status bar at the bottom shows the coordinate system as EPSG:4326, with coordinates -20°, -169°, a scale of 943012224, and a magnifier of 100%.

Click Here to Create New Shape File



Select Point type Geometry

The screenshot shows the QGIS interface with the 'New Shapefile Layer' dialog box open. A red arrow points to the 'Point' geometry type selection. The dialog box contains the following information:

- File name: C:\Users\91827\Desktop\Shapefile\Point type shapefile.shp
- File encoding: UTF-8
- Geometry type: Point
- Additional dimensions: None, Z (+M values), M values
- CRS: EPSG:4326 - WGS 84
- New Field: Name (empty), Type: abc Text (string), Length: 80, Precision (empty), Add to Fields List button
- Fields List table:

Name	Type	Length	Precision
id	Integer	10	

Buttons at the bottom of the dialog: OK, Cancel, Help.

Click Toggle editing and than Add Point feature

The screenshot displays the QGIS desktop application. The title bar reads '*Untitled Project - QGIS'. The menu bar includes Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, and Help. The toolbar contains various icons for navigation and editing. A red arrow points from the text 'Click Toggle editing' to the 'Toggle Editing' icon (a pencil with a slash) in the toolbar. Another red arrow points from the text 'than Add Point feature' to the 'Add Point Feature' icon (a yellow circle with a black dot) in the toolbar. A tooltip for the 'Add Point Feature' tool is visible, showing the text 'Add Point Feature (Ctrl+.)'. The left sidebar contains a 'Browser' panel with a file list and a 'Layers' panel with a layer list. The main canvas shows a topographic map of Uttarakhand, India, with a grid overlay. The status bar at the bottom displays 'Coordinate 79°, -146°', 'Scale 943012224', 'Magnifier 100%', 'Rotation 0.0°', 'Render', and 'EPSG:4326'.

Browser

- newResume-VarunRawat.pdf
- Pan Card.pdf
- pdf2doc.zip
- QGIS-3.22-DesktopUserGuide-en.pdf
- RE_Discussion.zip
- Relieving and experience.pdf
- Resume-VarunRawat (1).pdf
- Resume-VarunRawat (2).pdf
- Resume-VarunRawat.pdf
- Resume.pdf
- ShareDigitalExclusion.zip
- Toposheet (1).jpg
- Toposheet.jpg
- Toposheet.jpg.ovr
- Toposheet_georeferenced.tif
- TORGIS.pdf
- Untitled spreadsheet - Sheet1.csv
- Updated_Resume-VarunRawat.pdf
- UTTARAKHAND_ASPECT (1).bmp
- UTTARAKHAND_ASPECT.kml

Layers

- Point type shapefile
- Toposheet
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)

Coordinate 79°, -146° Scale 943012224 Magnifier 100% Rotation 0.0° Render EPSG:4326

Select point geometry type

The screenshot displays the QGIS interface with the 'New Shapefile Layer' dialog box open. The dialog box has the following fields and options:

- File name:** C:\Users\91827\Desktop\Shapefile\pointdata.shp
- File encoding:** UTF-8
- Geometry type:** Point (selected)
- Additional dimensions:** (empty)
- New Field:**
 - Name: (empty)
 - Type: abc Text (string)
 - Length: 80
 - Precision: (empty)
 - Buttons: Add to Fields List, Remove Field
- Fields List:**

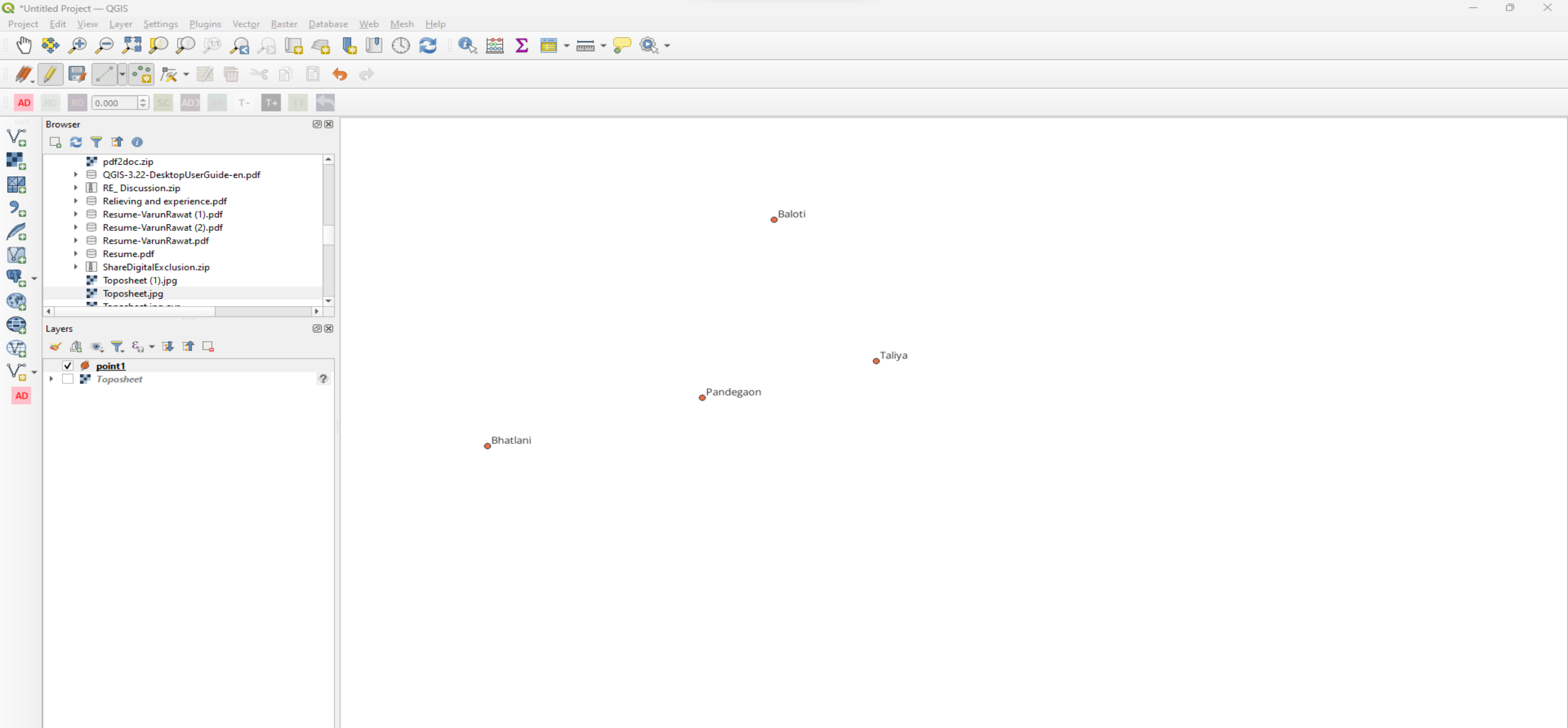
Name	Type	Length	Precision
id	Integer	10	

At the bottom of the dialog box are buttons for 'OK', 'Cancel', and 'Help'. A red arrow points from the title 'Select point geometry type' to the 'Point' option in the 'Geometry type' dropdown.

Mark the point (Village) in the map & Write Name of the Village in the Box

The screenshot displays the QGIS interface with a topographic map. A red arrow points from the instruction text to a red square marker on the map, which is labeled 'Pandegaon'. A dialog box titled 'poi...' is open over the marker, with the 'id' field set to '1' and the 'Village' field set to 'Pandegaon'. The 'Layers' panel on the left shows a 'pointdata' layer with three bands: Band 1 (Red), Band 2 (Green), and Band 3 (Blue). The 'Browser' panel shows a list of files, including 'newResume-VarunRawat.pdf', 'Pan Card.pdf', 'pdf2doc.zip', 'QGIS-3.22-DesktopUserGuide-en.pdf', 'RE_Discussion.zip', 'Relieving and experience.pdf', 'Resume-VarunRawat (1).pdf', 'Resume-VarunRawat (2).pdf', 'Resume-VarunRawat.pdf', 'Resume.pdf', 'ShareDigitalExclusion.zip', 'Toposheet (1).jpg', 'Toposheet.jpg', 'Toposheet.jpg.ovr', 'Toposheet_georeferenced.tif', 'TORGIS.pdf', 'Untitled spreadsheet - Sheet1.csv', 'Updated_Resume-VarunRawat.pdf', 'UTTARAKHAND_ASPECT (1).bmp', and 'UTTARAKHAND_ASPECT.bmp'. The status bar at the bottom shows the coordinate '1710.7, -2436.1', scale '1:2748', magnifier '100%', rotation '0.0 °', and render status 'Render' with 'EPSG:32644'.

Location of Four Villages digitised by creating Four Points



2. Digitization of Line Data Layer (Feature)

EXAMPLE

River

Open Map (Toposheet)

The screenshot displays the QGIS desktop environment. The main window title is '*Untitled Project — QGIS'. The interface includes a menu bar (Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, Help) and a toolbar with various GIS tools. On the left, the Browser panel shows a file tree with 'Toposheet (1).jpg' selected. Below it, the Layers panel shows the 'Toposheet' layer with three bands: Red, Green, and Blue. The main canvas displays a topographic map of Uttarakhand, India, with a grid overlay. The status bar at the bottom shows the coordinate system as EPSG:4326, with coordinates -20°, -169°, a scale of 943012224, and a magnifier of 100%.

Click Here to Create New Shape File

The image shows the QGIS desktop application interface. At the top, the title bar reads '*Untitled Project - QGIS'. Below it is a menu bar with options: Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, Help. A toolbar with various icons is positioned below the menu bar. On the left side, there is a 'Browser' panel displaying a file tree with items like 'Pan Card.pdf', 'pdf2doc.zip', 'QGIS-3.22-DesktopUserGuide-en.pdf', and 'Toposheet.jpg'. A context menu is open over the 'Toposheet.jpg' file, listing options: 'New Shapefile Layer...', 'New Spatialite Layer...', 'New GeoPackage Layer...' (with 'Ctrl+Shift+N' shortcut), and 'New Temporary Scratch Layer...'. Below the browser is the 'Layers' panel, which shows a checked layer named 'Toposheet' with three sub-layers: 'Band 1 (Red)', 'Band 2 (Green)', and 'Band 3 (Blue)'. The main map area displays a topographic map of a region in Uttar Pradesh, India, with a grid and various geographical features. At the bottom, a status bar shows 'Coordinate 45°, -154°', 'Scale 943012224', 'Magnifier 100%', 'Rotation 0.0°', 'Render', and 'EPSG:4326'. A search bar at the bottom left contains the text 'Type to locate (Ctrl+K)'.

Select Line type Geometry

The screenshot shows the QGIS interface with the 'New Shapefile Layer' dialog box open. The dialog box has the following fields and options:

- File name:** Line Type Shapefile.shp
- File encoding:** UTF-8
- Geometry type:** LineString (selected)
- Additional dimensions:** None (selected), Z (+ M values), M values
- Additional dimensions:** EPSG:4326 - WGS 84
- New Field:**
 - Name: [empty]
 - Type: abc Text (string)
 - Length: 80
 - Precision: [empty]
 - Buttons: Add to Fields List, Remove Field
- Fields List:**

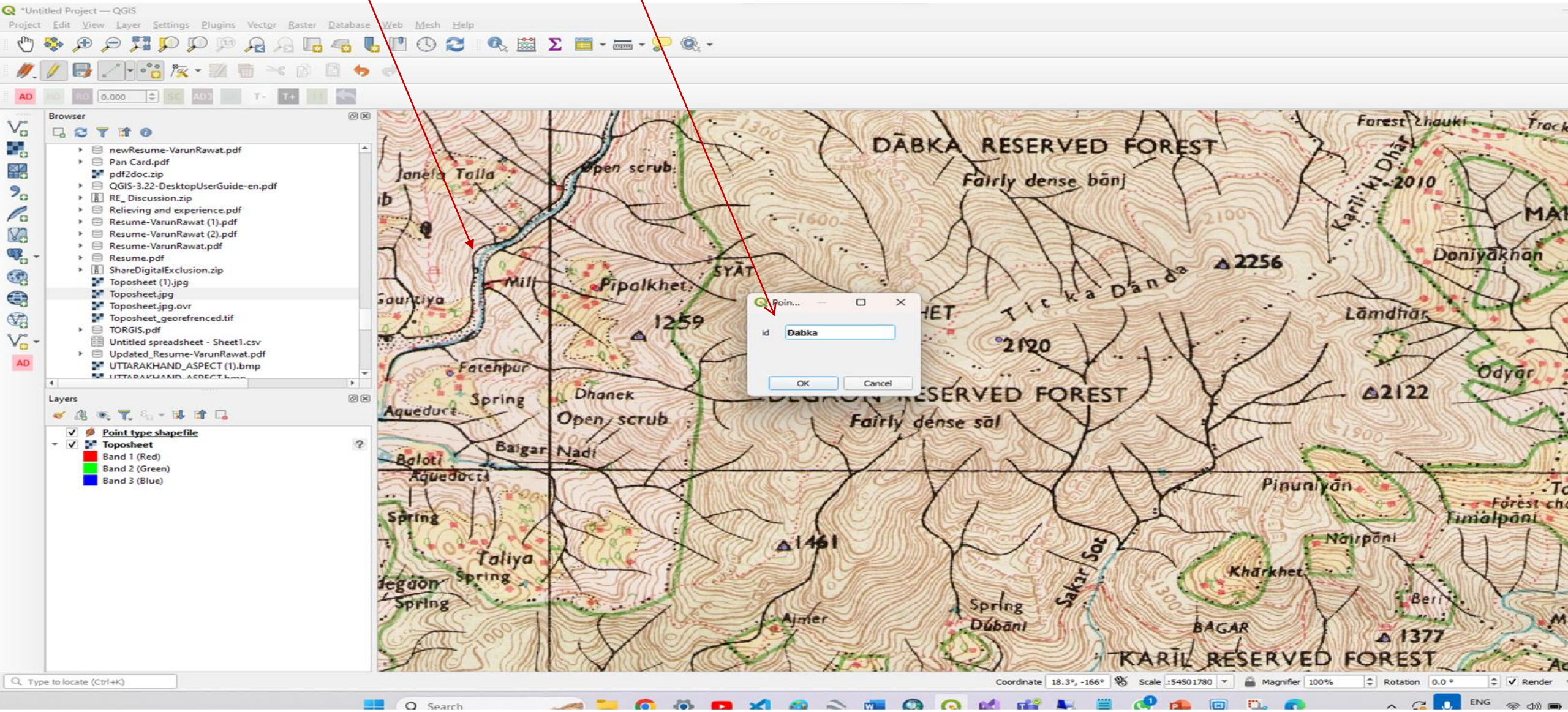
Name	Type	Length	Precision
id	Integer	10	

At the bottom of the dialog box are buttons for OK, Cancel, and Help.

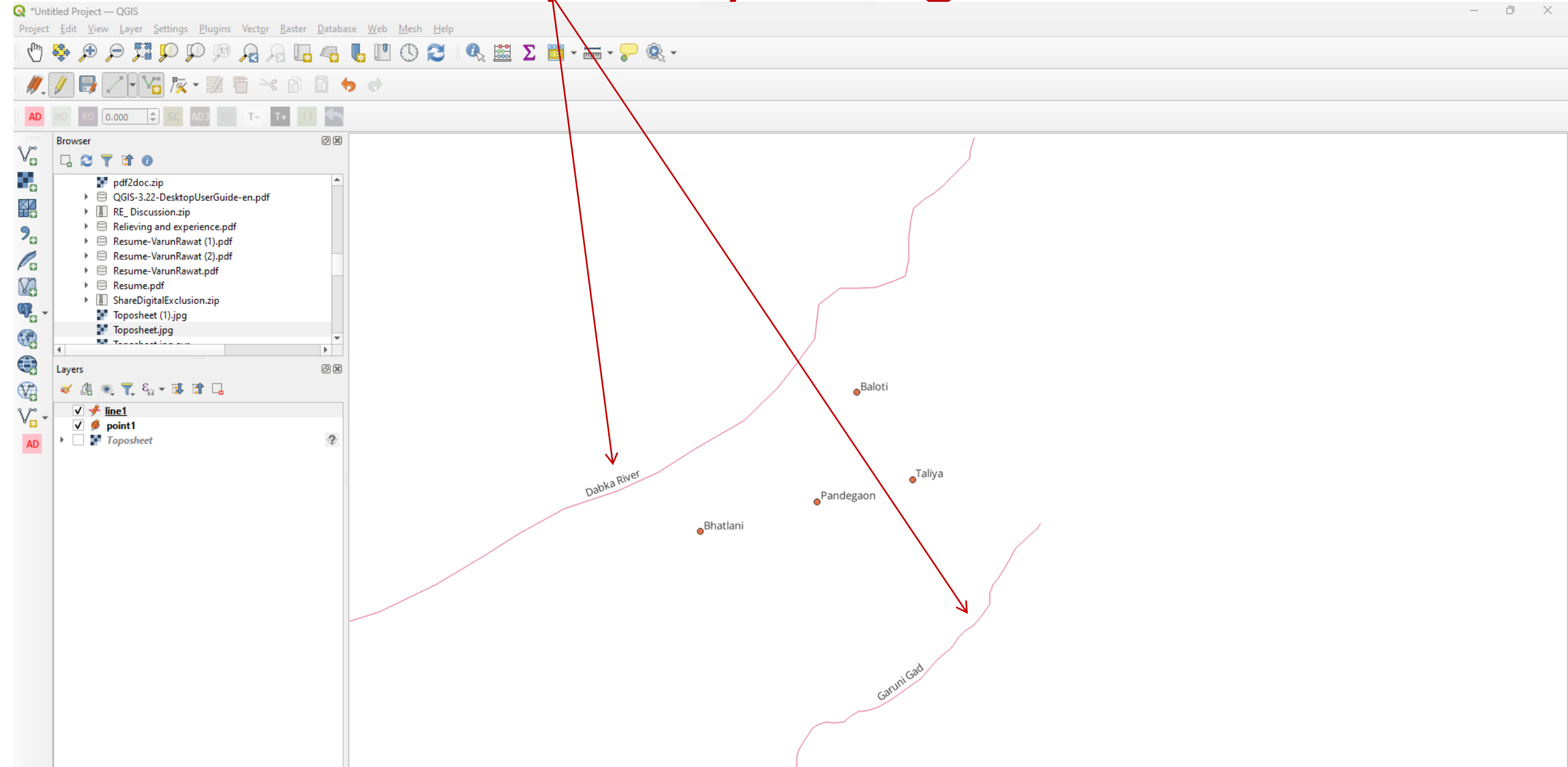
Click Toggle editing and than Add Line feature

The screenshot displays the QGIS desktop application. The title bar reads '*Untitled Project - QGIS'. The menu bar includes Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, and Help. The toolbar contains various icons for navigation and editing. A tooltip for the 'Add Point Feature (Ctrl+.)' tool is visible, indicating it is the active tool. The left sidebar shows the 'Browser' panel with a file list including 'newResume-VarunRawat.pdf', 'Pan Card.pdf', 'pdf2doc.zip', 'QGIS-3.22-DesktopUserGuide-en.pdf', 'RE_Discussion.zip', 'Relieving and experience.pdf', 'Resume-VarunRawat (1).pdf', 'Resume-VarunRawat (2).pdf', 'Resume-VarunRawat.pdf', 'Resume.pdf', 'ShareDigitalExclusion.zip', 'Toposheet (1).jpg', 'Toposheet.jpg', 'Toposheet.jpg.ovr', 'Toposheet_georeferenced.tif', 'TORGIS.pdf', 'Untitled spreadsheet - Sheet1.csv', 'Updated_Resume-VarunRawat.pdf', 'UTTARAKHAND_ASPECT (1).bmp', and 'UTTARAKHAND_ASPECT.kmz'. Below the browser is the 'Layers' panel, which shows 'Point type shapefile' and 'Toposheet' with three bands: 'Band 1 (Red)', 'Band 2 (Green)', and 'Band 3 (Blue)'. The main canvas displays a topographic map of Uttarakhand, India, with a grid and various geographical features. The status bar at the bottom shows 'Coordinate 79°, -146°', 'Scale 943012224', 'Magnifier 100%', 'Rotation 0.0°', 'Render', and 'EPSG:4326'.

Mark the line Layer (River) in the map & Write the Name of River in the Box



Two Line Features (Rivers) are digitized



3. Digitization of Polygon Layer (Feature)

Example

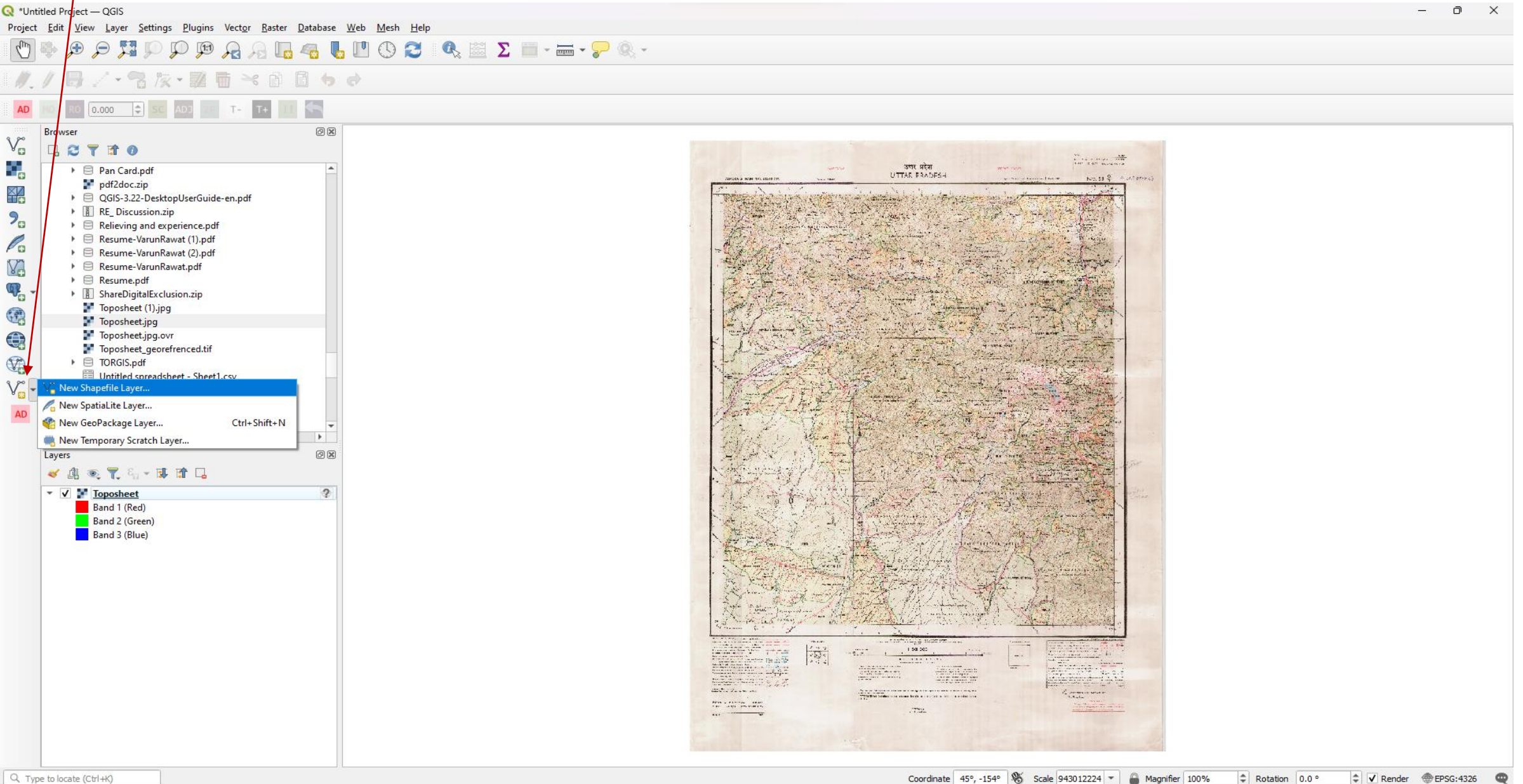
Agricultural Land Area

Open Map (Toposheet)

The screenshot displays the QGIS desktop environment. The main window is titled '*Untitled Project — QGIS'. The interface is divided into several panels:

- Browser Panel:** Located on the left, it shows a file tree. A red arrow points from the title 'Open Map (Toposheet)' to the file 'Toposheet (1).jpg' in this panel.
- Layers Panel:** Located below the Browser panel, it shows the loaded layer 'Toposheet' with three color-coded bands: Band 1 (Red), Band 2 (Green), and Band 3 (Blue).
- Main Canvas:** Displays a detailed topographic map of a region in Uttarakhand, India. The map title is 'उत्तर प्रदेश UTTAR PRADESH'. The map shows terrain contours, roads, and other geographical features.
- Status Bar:** At the bottom, it shows the coordinate system as EPSG:4326, with coordinates -20°, -169°. Other information includes Scale 943012224, Magnifier 100%, and Rotation 0.0°.

Click Here to Create New Shape File



Select Polygon type Geometry

The screenshot shows the QGIS interface with the 'New Shapefile Layer' dialog box open. The dialog is titled 'New Shapefile Layer' and has the following settings:

- File name: Polygon type shapefile.shp
- File encoding: UTF-8
- Geometry type: Polygon
- Additional dimensions: None, Z (+M values), M values
- CRS: EPSG:4326 - WGS 84

The 'New Field' section contains:

- Name: (empty)
- Type: abc Text (string)
- Length: 80
- Precision: (empty)
- Buttons: Add to Fields List, Remove Field

The 'Fields List' table is as follows:

Name	Type	Length	Precision
id	Integer	10	

At the bottom of the dialog are buttons for OK, Cancel, and Help.

The background shows the QGIS interface with the 'Layers' panel on the left containing 'Line Type shapefile', 'Point type shapefile', and 'Toposheet'. The status bar at the bottom indicates the coordinate system is EPSG:4326.

Click Toggle editing and than Add Polygon feature

The screenshot displays the QGIS desktop application. At the top, the menu bar includes Project, Edit, View, Layer, Settings, Plugins, Vector, Raster, Database, Web, Mesh, and Help. The toolbar below contains various icons for navigation and editing. A red arrow points from the main title to the 'Toggle Editing' icon (a pencil with a slash) in the toolbar. Another red arrow points from the same title to the 'Add Point Feature' icon (a yellow square with a black dot) in the toolbar. A tooltip for the 'Add Point Feature' tool is visible, showing the text 'Add Point Feature (Ctrl+.)'. The left sidebar contains a 'Browser' panel with a file list and a 'Layers' panel with a layer list. The main canvas shows a topographic map of Uttarakhand, India, with a grid overlay. The status bar at the bottom provides coordinate information (79°, -146°), scale (943012224), magnifier (100%), rotation (0.0°), and projection (EPSG:4326).

Browser

- newResume-VarunRawat.pdf
- Pan Card.pdf
- pdf2doc.zip
- QGIS-3.22-DesktopUserGuide-en.pdf
- RE_Discussion.zip
- Relieving and experience.pdf
- Resume-VarunRawat (1).pdf
- Resume-VarunRawat (2).pdf
- Resume-VarunRawat.pdf
- Resume.pdf
- ShareDigitalExclusion.zip
- Toposheet (1).jpg
- Toposheet.jpg
- Toposheet.jpg.ovr
- Toposheet_georeferenced.tif
- TORGIS.pdf
- Untitled spreadsheet - Sheet1.csv
- Updated_Resume-VarunRawat.pdf
- UTTARAKHAND_ASPECT (1).bmp
- UTTARAKHAND_ASPECT.kml

Layers

- Point type shapefile
- Toposheet
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)

Coordinate 79°, -146° Scale 943012224 Magnifier 100% Rotation 0.0° Render EPSG:4326

Mark the Polygon in the map

The image shows a screenshot of the QGIS desktop application. The main window displays a topographic map of a region in Uttarakhand, India, featuring contour lines, rivers, and various land use features. A green polygon is drawn on the map, highlighting a specific area. A red arrow originates from the title 'Mark the Polygon in the map' and points directly to this green polygon. The interface includes a menu bar at the top, a toolbar with various icons, and two panels on the left: 'Browser' and 'Layers'. The 'Layers' panel shows a legend with 'Polygon' (green) and 'Toposheet' (red, green, blue) layers. The status bar at the bottom provides coordinate, scale, and magnification information.

QGIS *Untitled Project — QGIS

Project Edit View Layer Settings Plugins Vector Raster Database Web Mesh Help

Browser

- ShareDigitalExclusion.zip
- Toposheet (1).jpg
- Toposheet.jpg
- Toposheet.jpg.ovr
- Toposheet_georeferenced.tif
- TORGIS.pdf
- Untitled spreadsheet - Sheet1.csv
- Updated_Resume-VarunRawat.pdf
- UTTARAKHAND_ASPECT (1).bmp
- UTTARAKHAND_ASPECT.bmp
- Uttarakhand_Block_Boundary.zip
- UTTARAKHAND_SLOPE (1).bmp
- UTTARAKHAND_SLOPE.bmp

Layers

- Polygon
- Toposheet
 - Band 1 (Red)
 - Band 2 (Green)
 - Band 3 (Blue)

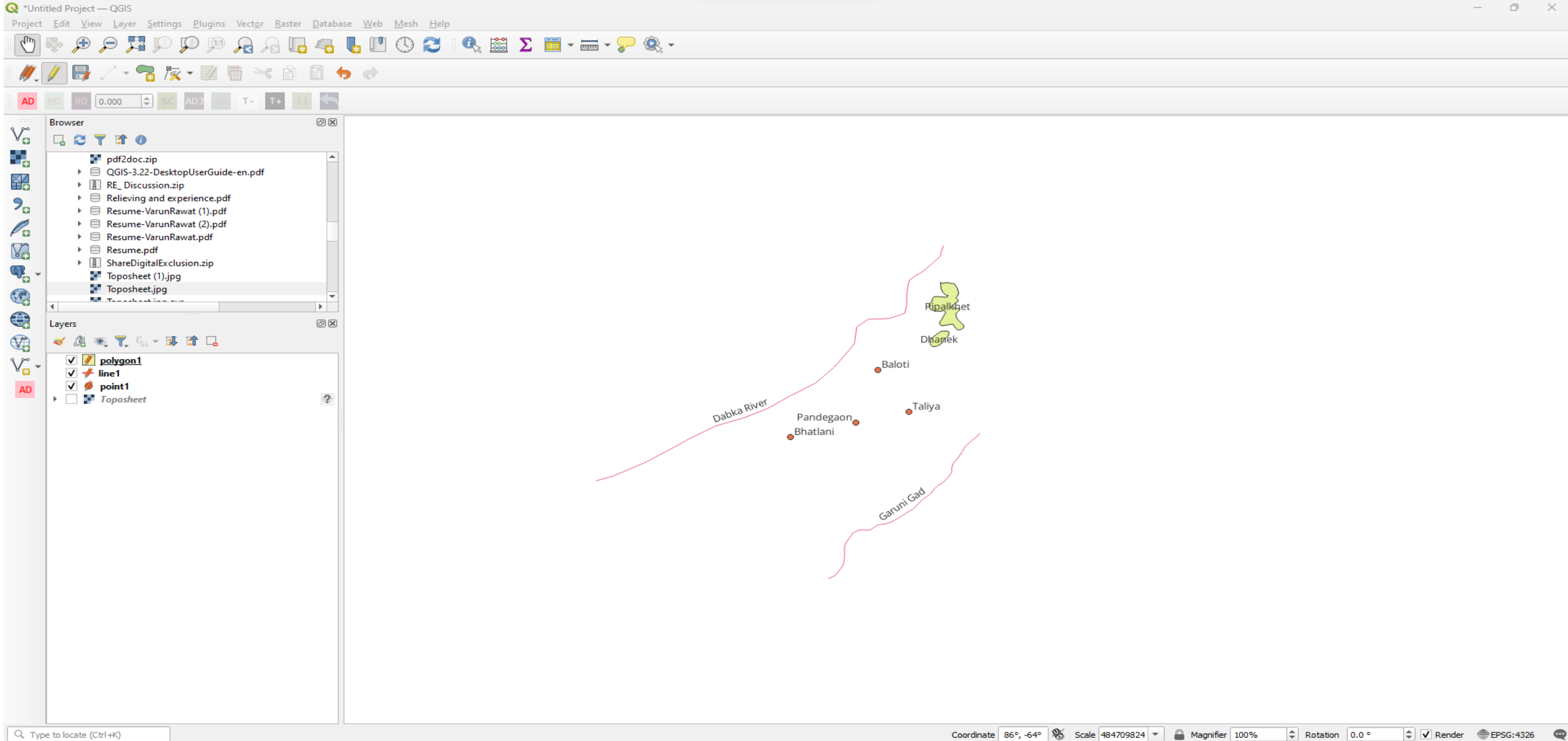
Coordinate: 66.1°, -148.2° Scale: 1:80496096 Magnifier: 100% Rotation: 0.0° Render EPSG:4326

Polygon Layers (Agricultural Land Area) created

The screenshot displays the QGIS interface with the following components:

- Browser Panel:** Lists various files including PDFs, ZIPs, and image files like 'Toposheet (1).jpg' and 'Toposheet.jpg'.
- Layers Panel:** Shows a list of layers: 'polygon1' (checked), 'line1' (checked), 'point1' (checked), and 'Toposheet' (unchecked).
- Map Canvas:** Displays a map with a pink line network representing the 'Dabka River' and 'Garuni Gad'. Several points are marked: Bhatlani, Pandegaon, Taliya, Baloti, Pipalkhet, and Dhank. Two green polygons are overlaid on the map, with red arrows pointing to them from the title text above. The polygons are labeled 'Pipalkhet' and 'Dhank'.
- Bottom Panel:** Shows coordinate information (38.4°, 59.4°), scale (1:4486349), magnifier (100%), rotation (0.0°), and render status (EPSG:4326).

Thus, Point (Village), Line(River) and Polygon (Agriculture Land Area) were created through digitization



THANK YOU