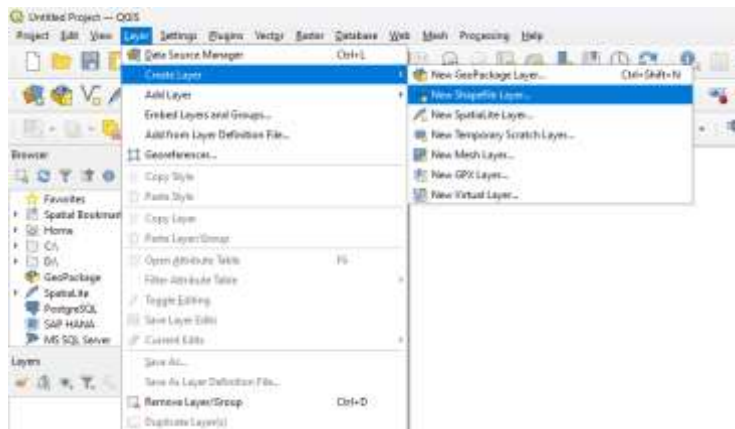
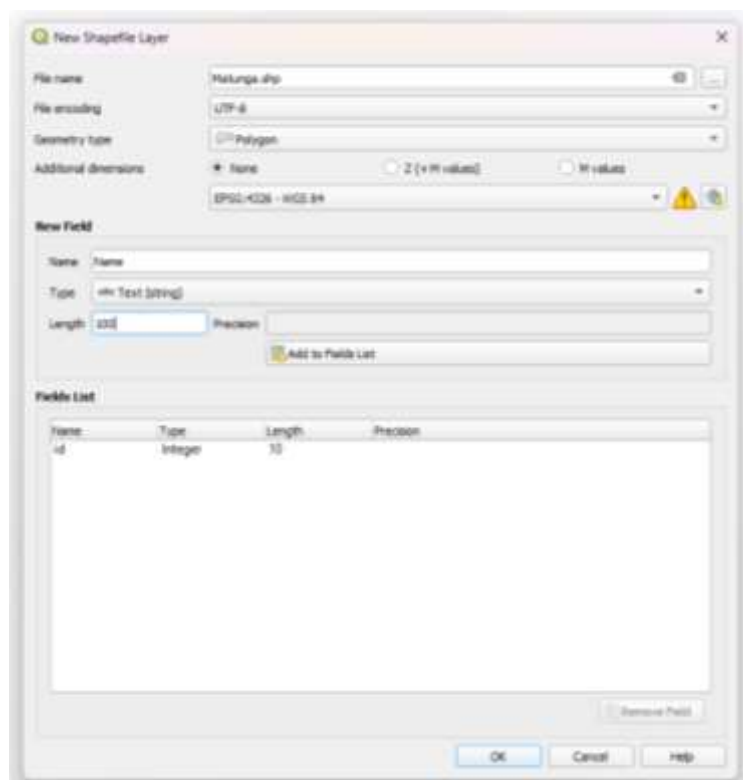


a) Creating Polygon vector layer

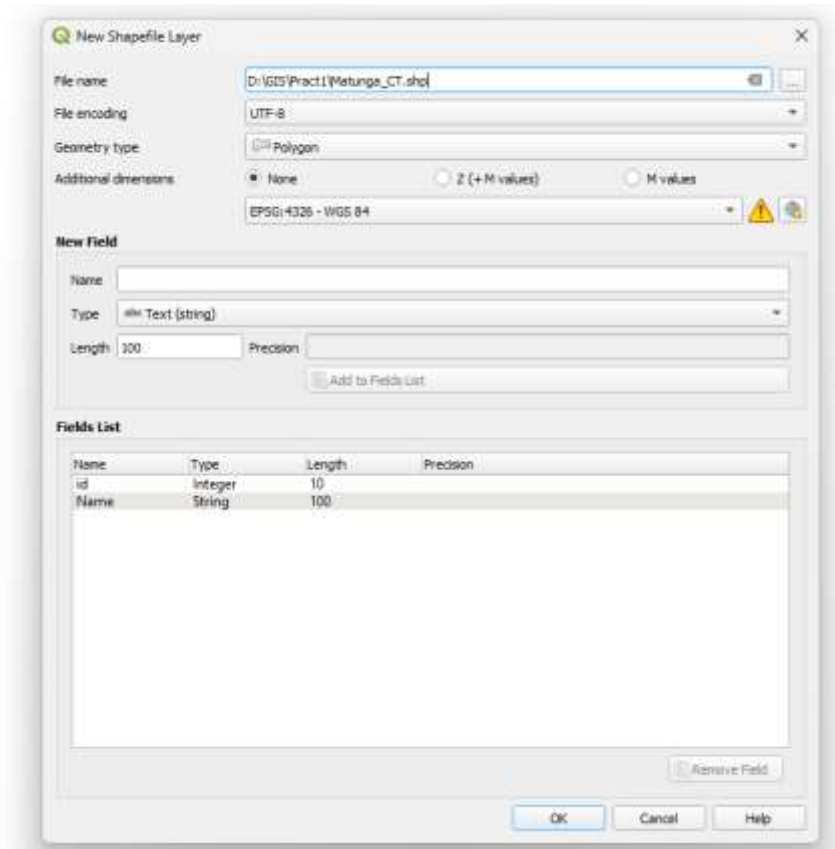
- Select **Project**→**New**
- Select **Layer**→**Create Layer**→**New Shapefile Layer**



- Following dialog box will appear on the screen. Select Polygon option from Geometry type.

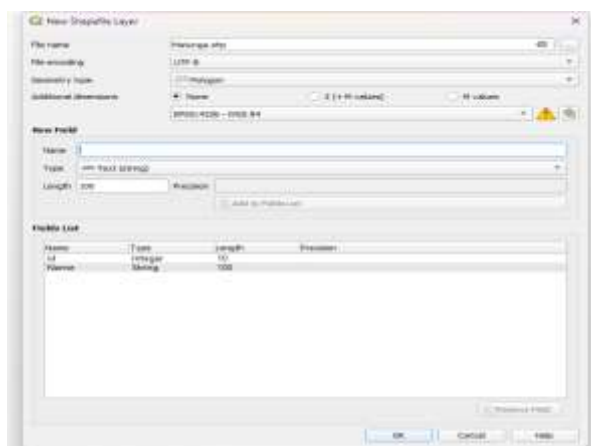


- Fill the appropriate information in each text box.
 - File name :
 - By default the file will be saved in bin folder.
 - To avoid it click on following button to change the location of file.

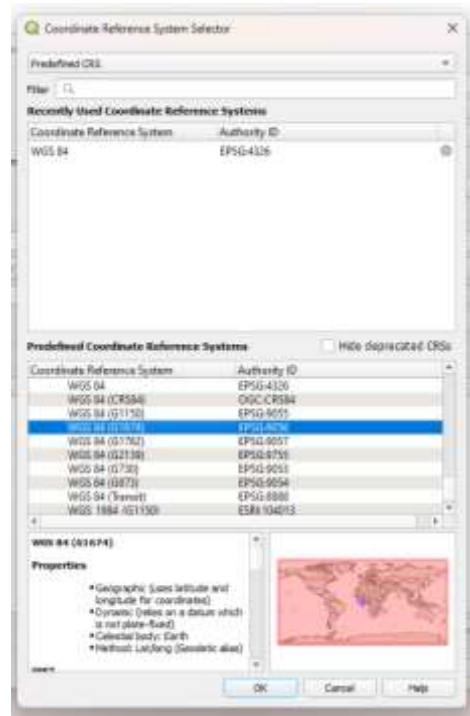


➤ Field Panel

- Add the Attribute you want to show. (Column Name for Table)
 - b. Specify Type (**Data Type**: Text Data/Decimal Data/Whole Number/Date) of Attribute
 - c. Specify the **Length** of the Attribute. Specify **Precision** (If Data Type is Decimal)
- Click on Add to Field List Button.
- You can add as many fields (Column Name) as you want for the layer.
- Select Geometry Type as follows
 - Click on the following button



- The CRS dialog box will appear on screen. Click on the WGS84 option and it will be selected as follows. click on OK

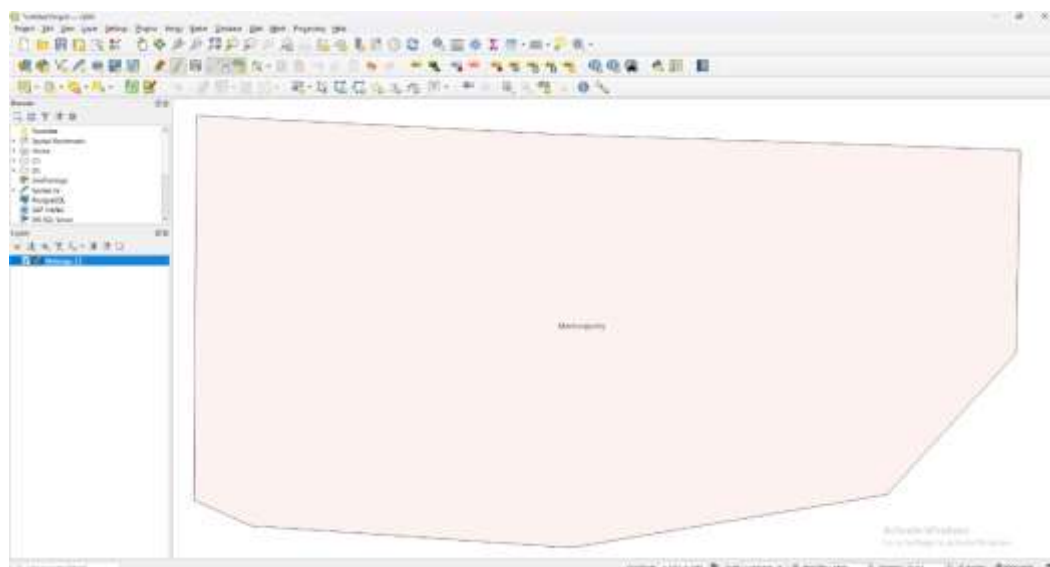


- a) Follow the steps to plot Polygon features.

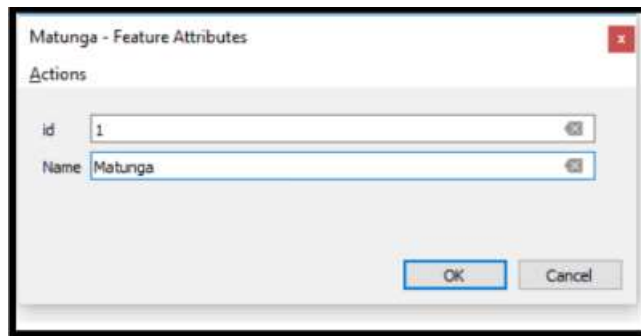
- Select the Polygon Feature(In our case it is Matunga for background) from layer panel



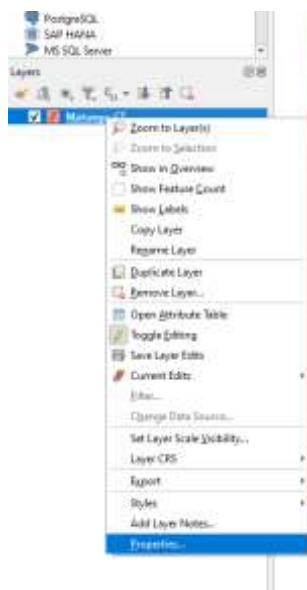
- Click **Toggle Editing Button** → Click on **Add Polygon** → Now place the cursor at the location where you want to place the polygon. for **polygon layer minimum 3 points** should be selected



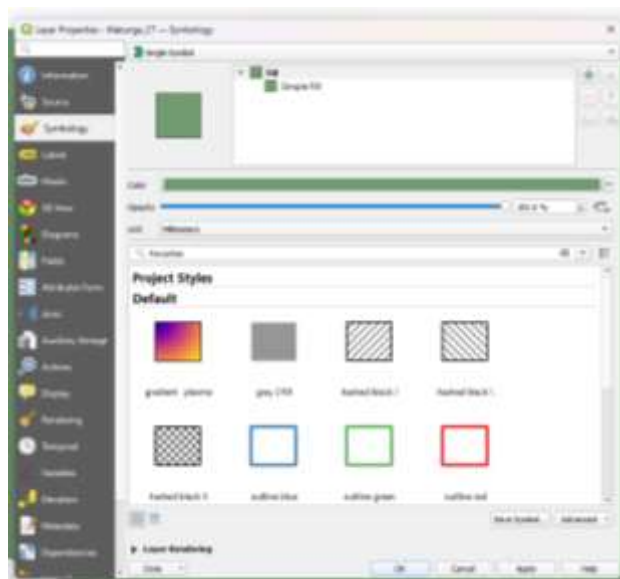
- Save the newly added polygon as follows.



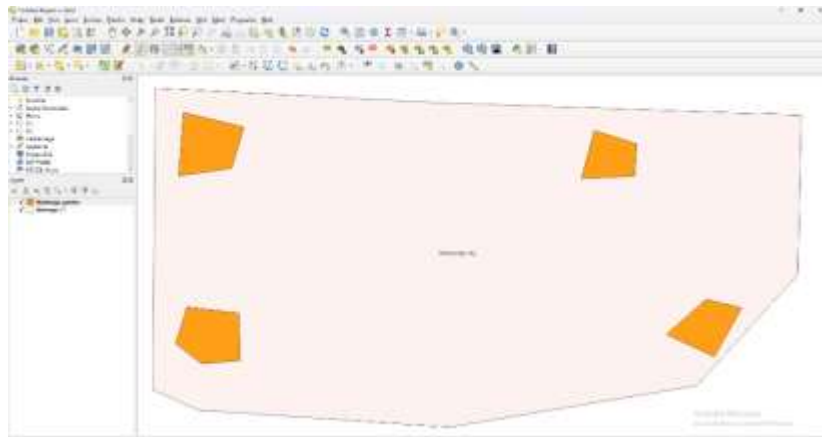
- Set style for polygon by using property window(Right click on Matunga Layer)



- Following screen will appear on the screen. Select pattern as you want and click on OK.



- Same way we can add one more polygon layer for Gardens.

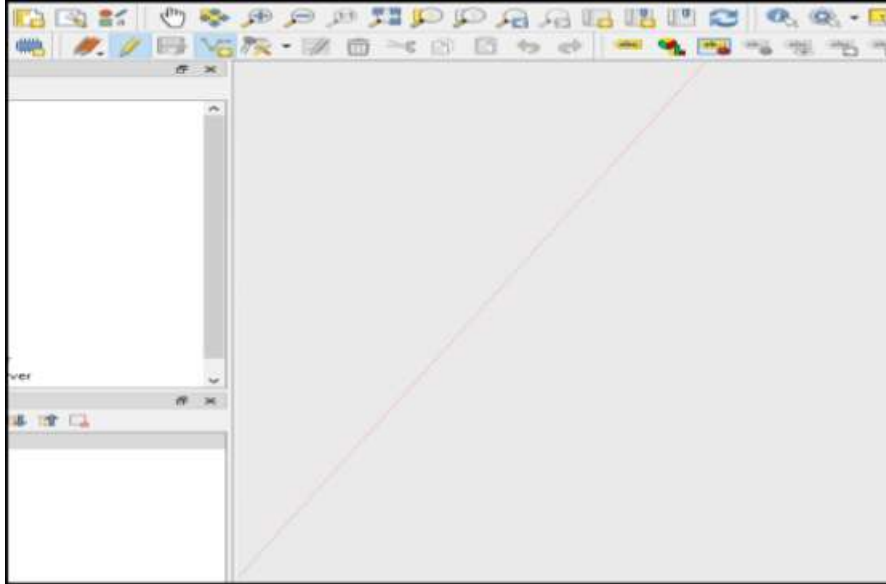


b) Creating Line vector layer

- Repeat the same steps as we have done for polygon layer.
- Select geometry type Line.'
- **Road layer :**
- To plot road click on Add Line Feature.

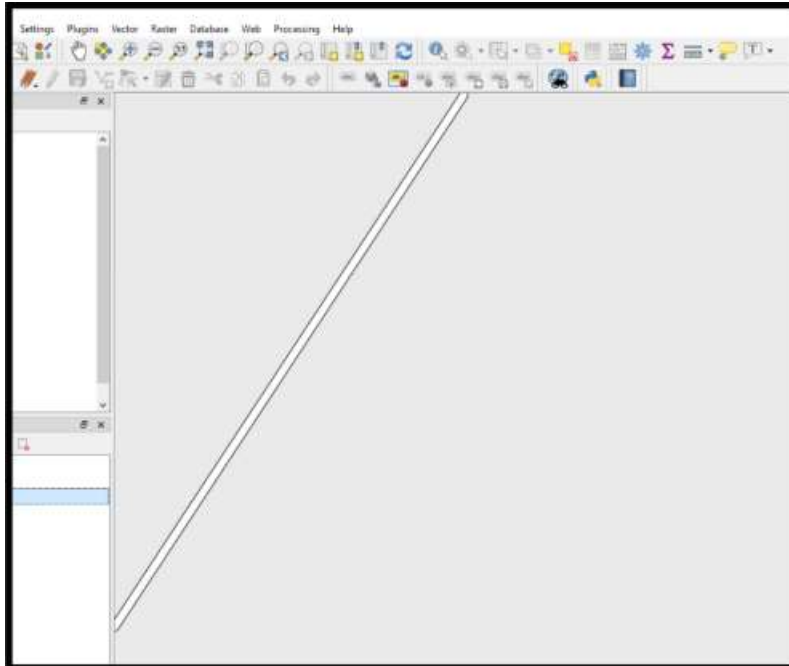


- Click on the map where you want to draw line.

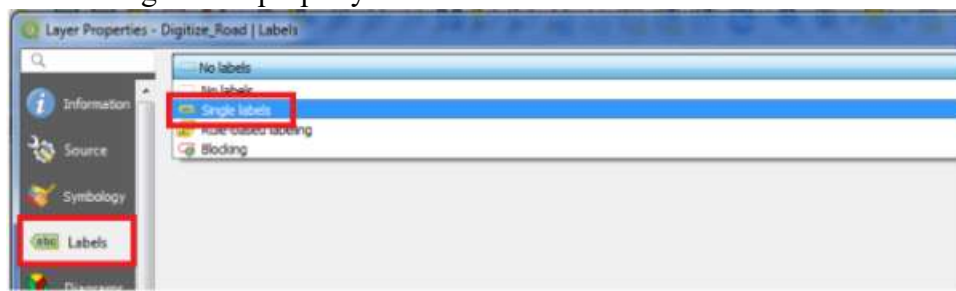


- Once you are done then right click on map (Dotted line turn into solid line)
- save your data

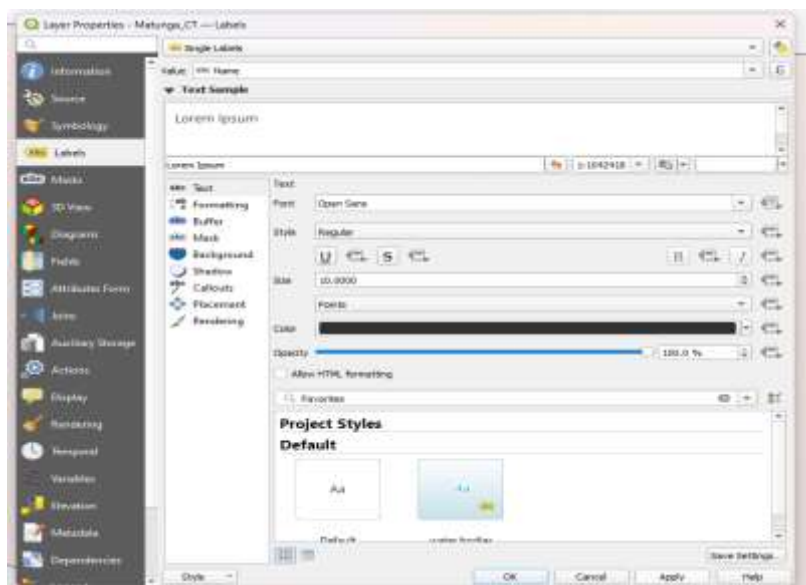
- set style for Roads in the same way as we have done for polygon
- Road will look as below



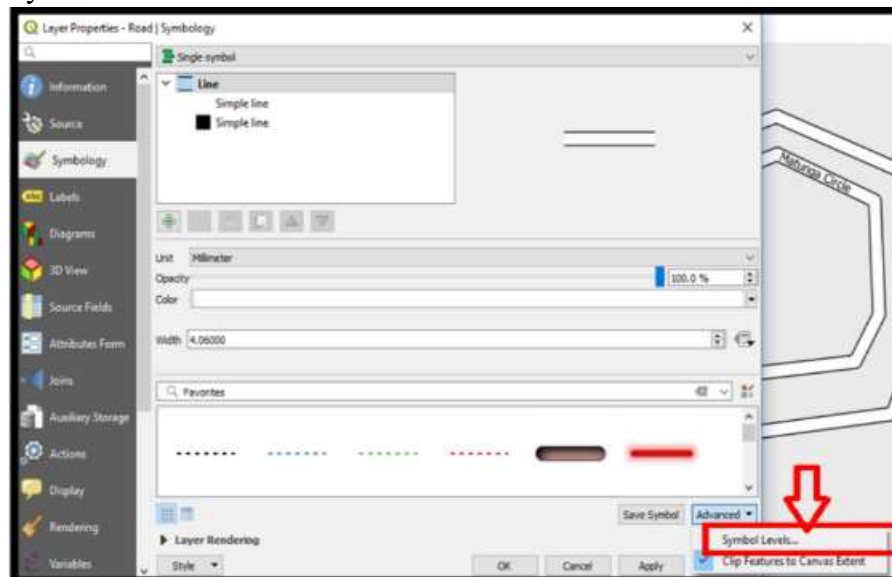
- To label your roads Right click on Road layer .Go to properties window then select label and set single label property



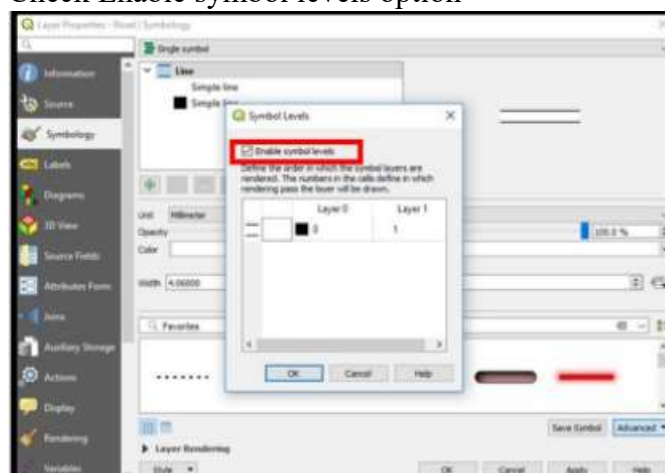
- Following window will appear on the screen



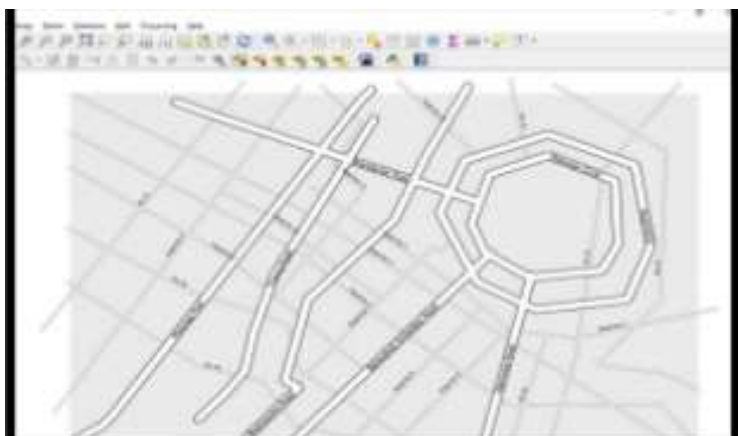
- To merge roads
 - Go to properties of road then select symbology. Click on Advanced button select Symbol levels.



- Check Enable symbol levels option

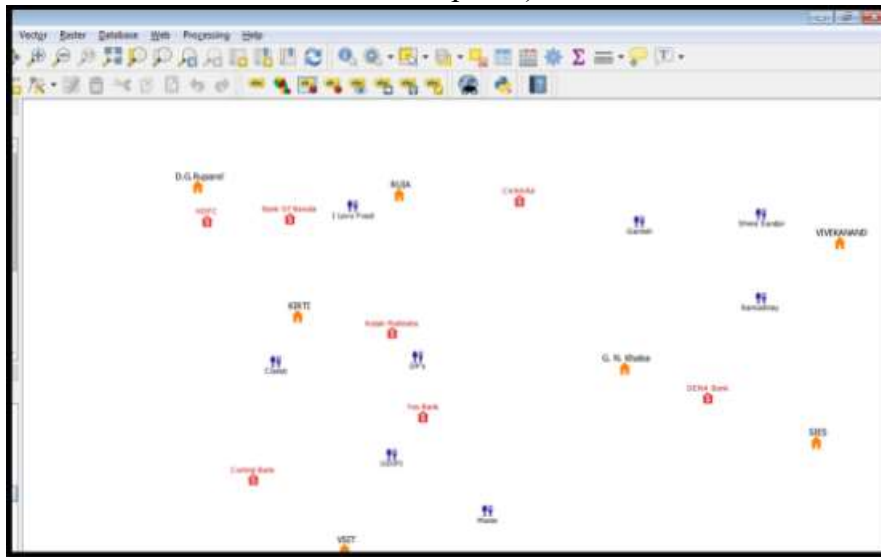


- Click ok & Road will appear

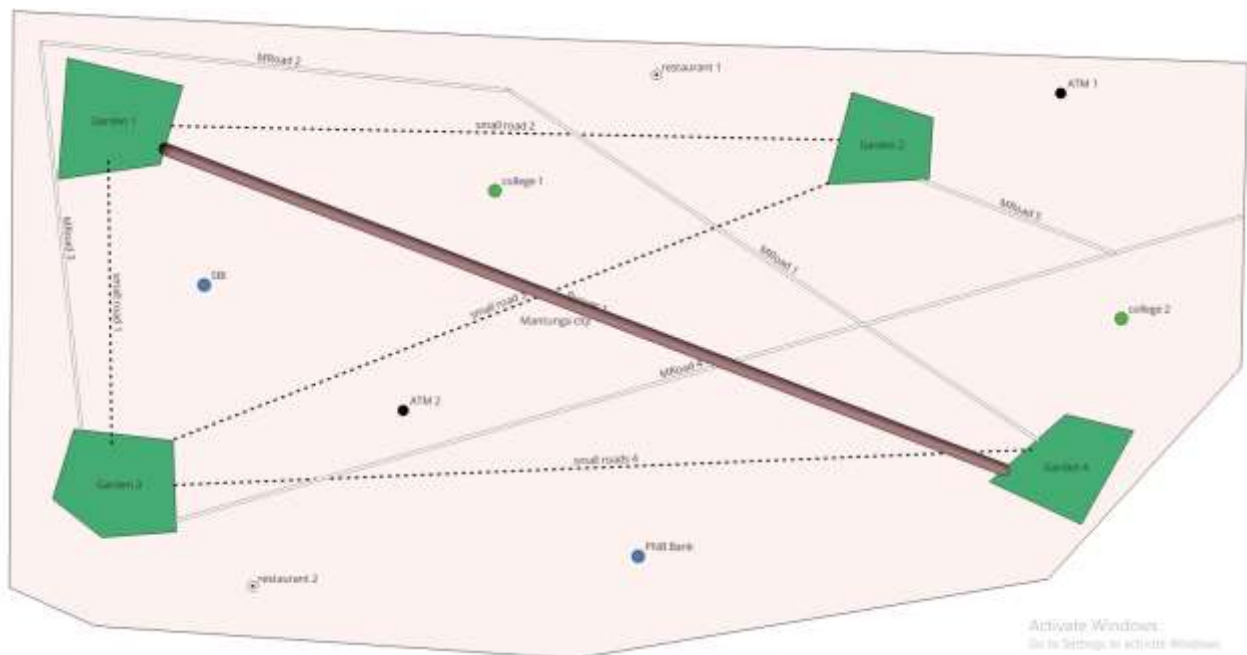


C. Create Point vector layer

- Repeat same steps to add point layers as we have done in previous layers.(For ATM, Restaurants, Banks, Bus Stops etc)

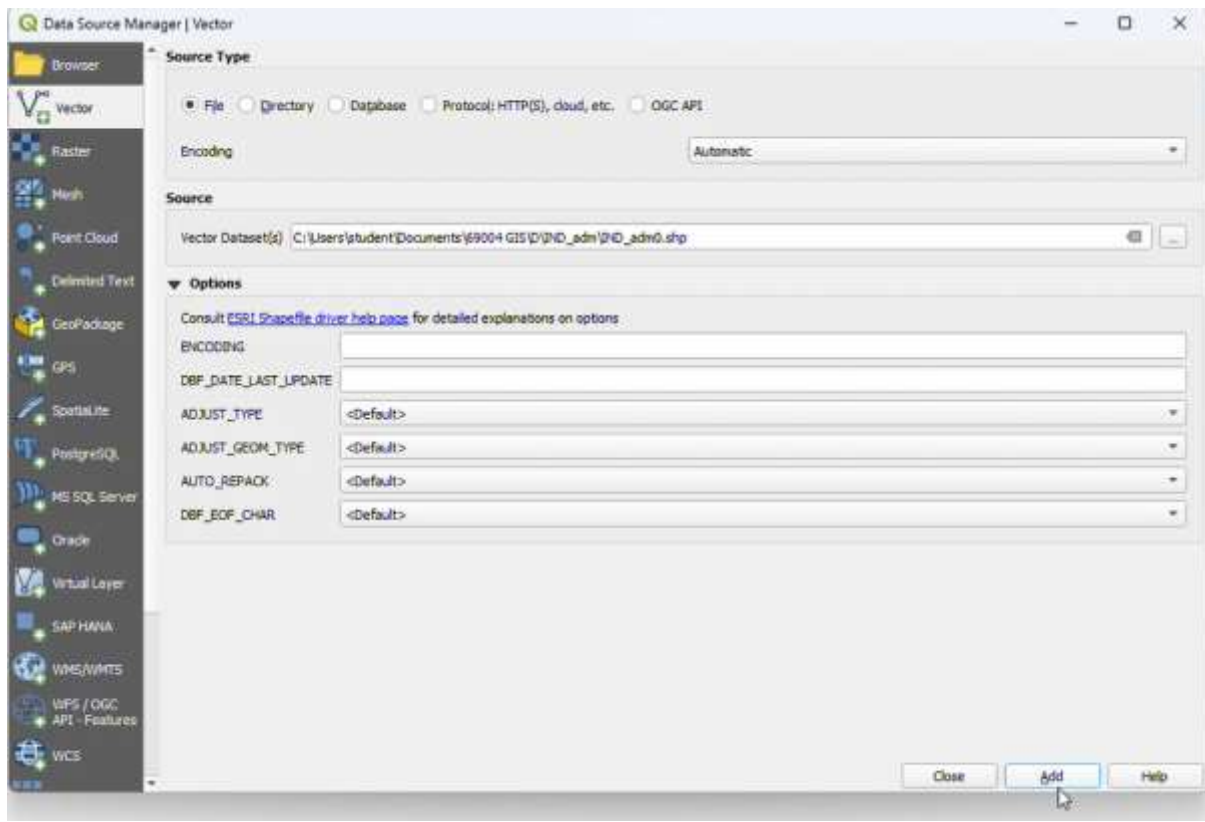


Final output:



d) Calculating line lengths and statistics

- Go to Layer → Add Layer → Add Vector Layer
- Add the following file to project



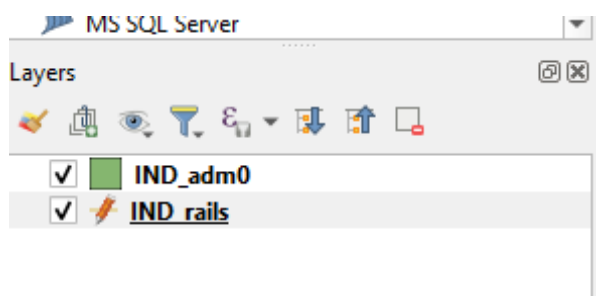
"GIS_Workshop\Practicals\Practical_01\D\DATA\IND_rrd\IND_rails.shp"

Press "ADD"

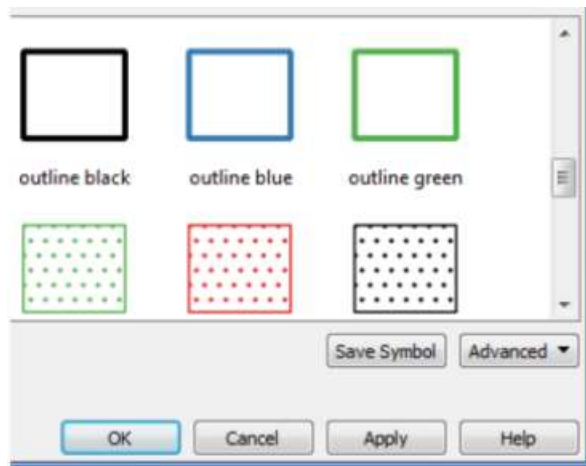
- Also add India Administrative Map

"GIS_Workshop\Practicals\Practical_01\D\DATA\IND_adm\IND_adm0.shp"

- Double Click on IND_adm0



Select Symbolology → Select any outline style from below given options.

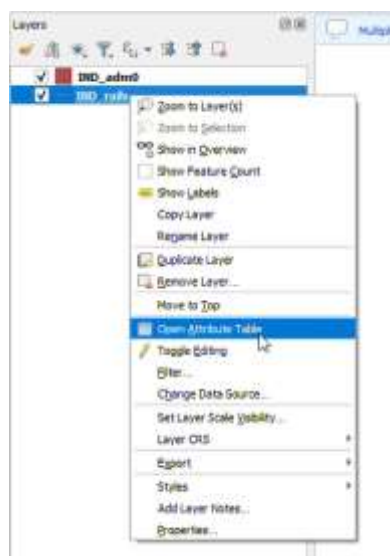


Press OK

- The display window will appear like



- In Layer Pane, Right click on IND_rails → Open Attribute Table



	FID_rail_d	F_CODE_DES	EXS_DESCRI	FCO_DESCRI	FID_countr	ISO	ISOCOUNTRY	Track_Len
1	144645	Railroad	Operational	Single	102	IND	INDIA	29
2	145991	Railroad	Operational	Single	102	IND	INDIA	66
3	146001	Railroad	Operational	Single	102	IND	INDIA	2

- Press Toggle Editing button using button, on Attribute table window toolbar.
- Press Open Field Calculator using button.
- Set the output field as “Track_Len”, field type to “Decimal Number”.

IND_rails — Field Calculator

☐ Only update 0 selected features

☒ Create a new field

☐ Create virtual field

Output field name: Length

Output field type: 1.2 Decimal number (real)

Output field length: 10 Precision: 2

- From Function List search \$length or go to Geometry → Select \$length

Expression Function Editor

Search: Se... Show Help

Function List:

- Date and Time
- Fields and Values
- Files and Paths
- Fuzzy Matching
- General
- Geometry**
 - affine_transf...
 - angle_at_vert...
 - apply_dash_p...
 - \$area
 - area
 - azimuth
 - bearing
 - boundary
 - bounds
 - bounds_height
 - bounds_width
 - buffer
 - buffer_by_m
 - centroid

Expression text area: (empty)

Feature: Operational

Preview: (empty)

- Set expression as

Expression Function Editor

Expression text area: \$length / 1000

Press “OK”

- A new column is added to the attribute table with value representing the length of track in KM.

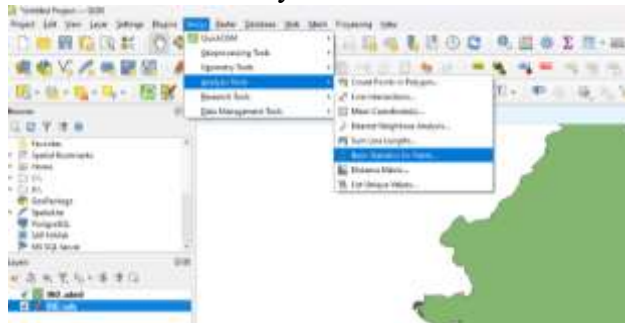
IND_rails — Features Total: 2012, Filtered: 2012, Selected: 0

123 FID_rail_d = 123

Update All Update Selected

	d	F_CODE_DES	EXS_DESCR	FCO_DESCR	FID_countr	ISO	ISOCOUNTRY	Track_Len	Length
1	44645	Railroad	Operational	Single	102	IND	INDIA	29	29.01
2	45991	Railroad	Operational	Single	102	IND	INDIA	66	66.13
3	46001	Railroad	Operational	Single	102	IND	INDIA	2	2.33
4	46008	Railroad	Operational	Single	102	IND	INDIA	64	63.81
5	46096	Railroad	Operational	Single	102	IND	INDIA	93	92.71
6	46394	Railroad	Operational	Single	102	IND	INDIA	22	22.24

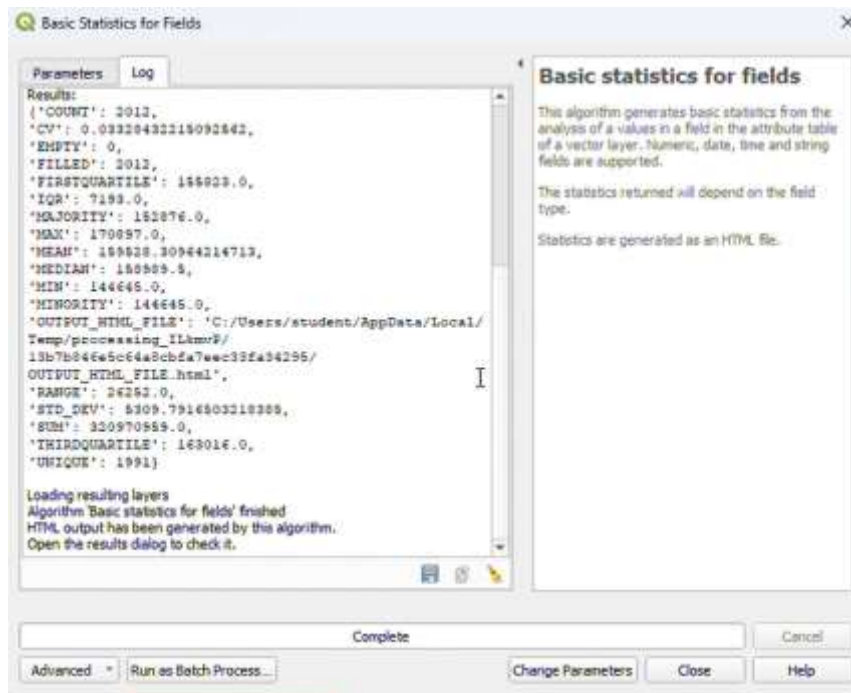
- Press CTRL+S or click on Save Edits option on tool bar
- Close the attribute table window.
- For calculating the total length of Railway tracks in India.
- Select Vector→ Analysis Tools→ Basic Statics for Fields



- Select IND_rails layer from input layer. And select Track_Len in “Field to Calculate statistics on”



- Press RUN
- The Result is



- Open the “output.html” file to get the field statistics.

Analyzed field: FID_rail_d

Count: 2012

Unique values: 1991

NULL (missing) values: 0

Minimum value: 144645.0

Maximum value: 170897.0

Range: 26252.0

Sum: 320970959.0

Mean value: 159528.30964214713

Median value: 158989.5

Standard deviation: 5309.7916503218385

Coefficient of Variation: 0.03328432215092562

Minority (rarest occurring value): 144645.0

Majority (most frequently occurring value): 152876.0

First quartile: 155823.0

Third quartile: 163016.0

Interquartile Range (IQR): 7193.0

- The above statistics show that the total length of Railway track in India is 320970959.0 KM.