HOW TO GEO-REFERENCE A RASTER MAP

Case Taken : A Development Plan Sheet of Mumbai

Tutorial by
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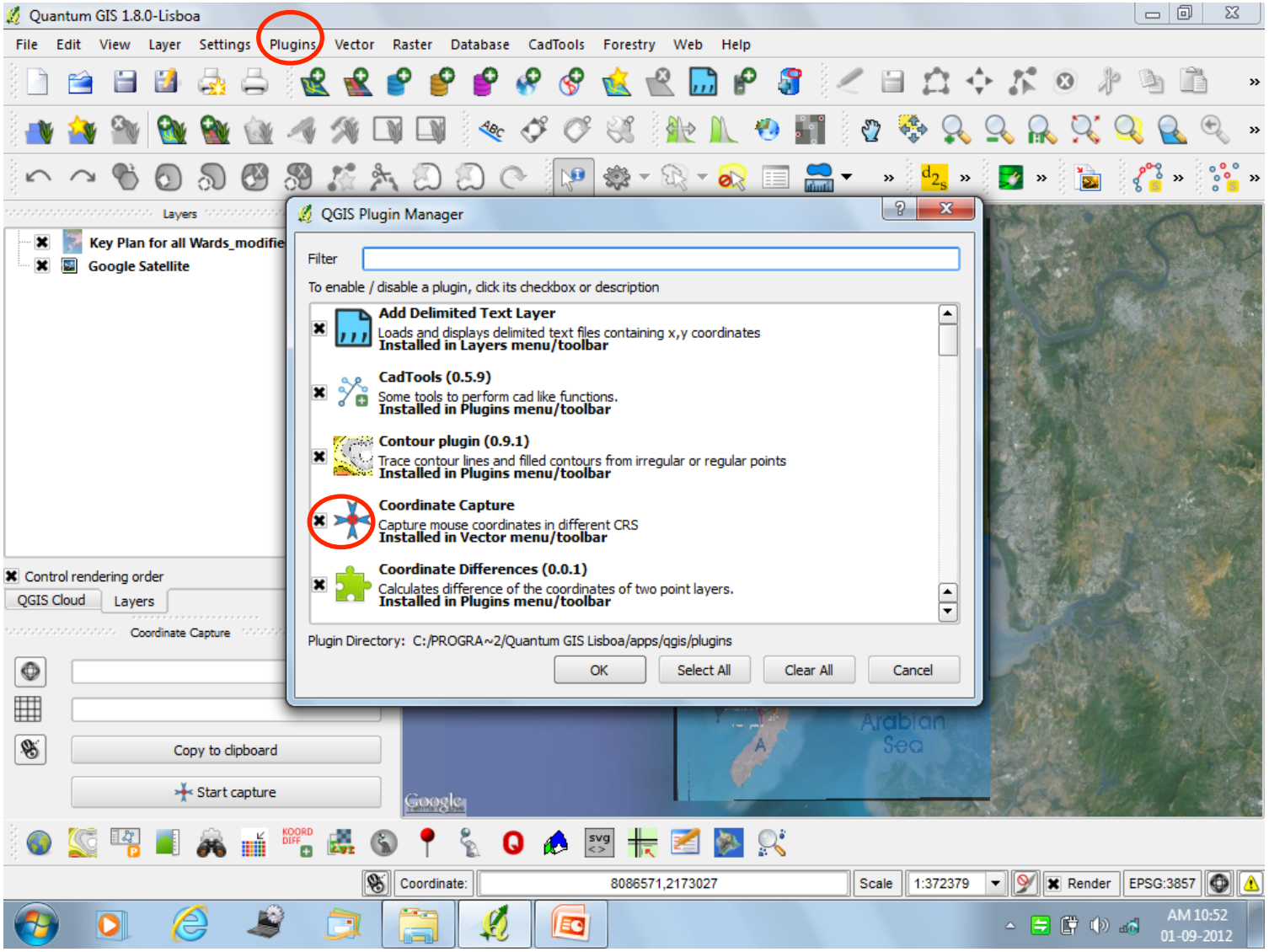
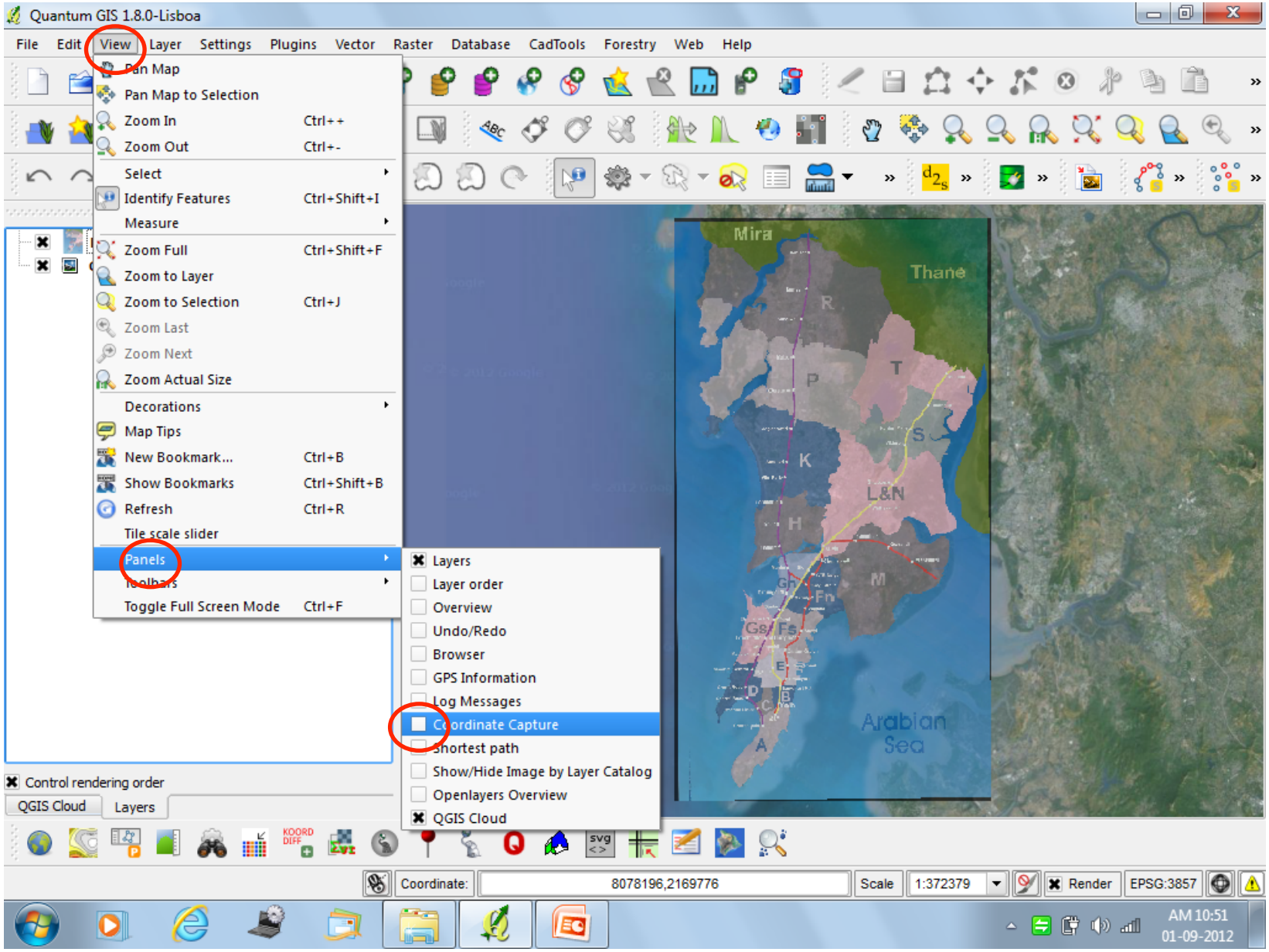
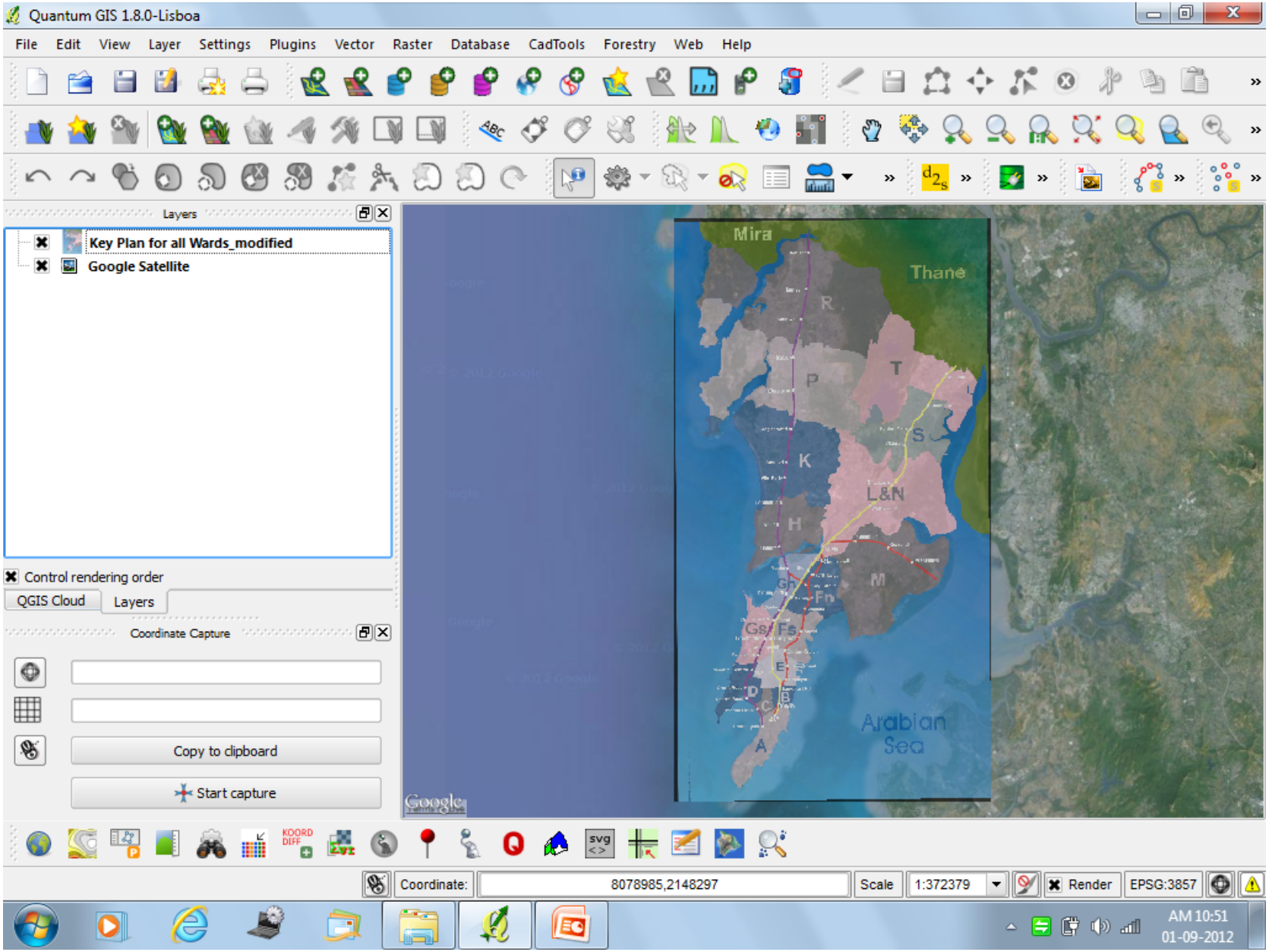
Open QGIS and load a Vector or Raster data which is already Geo-referenced. Click on ‘Plugins’ and then ‘OpenLayers’ and select Google Satellite. This will put a Google Earth layer below your Geo-referenced Raster or Vector layer. If ‘OpenLayers’ is not installed then click on ‘Fetch’ and install it. Also ensure that ‘Coordinate Capture’ icon is checked.



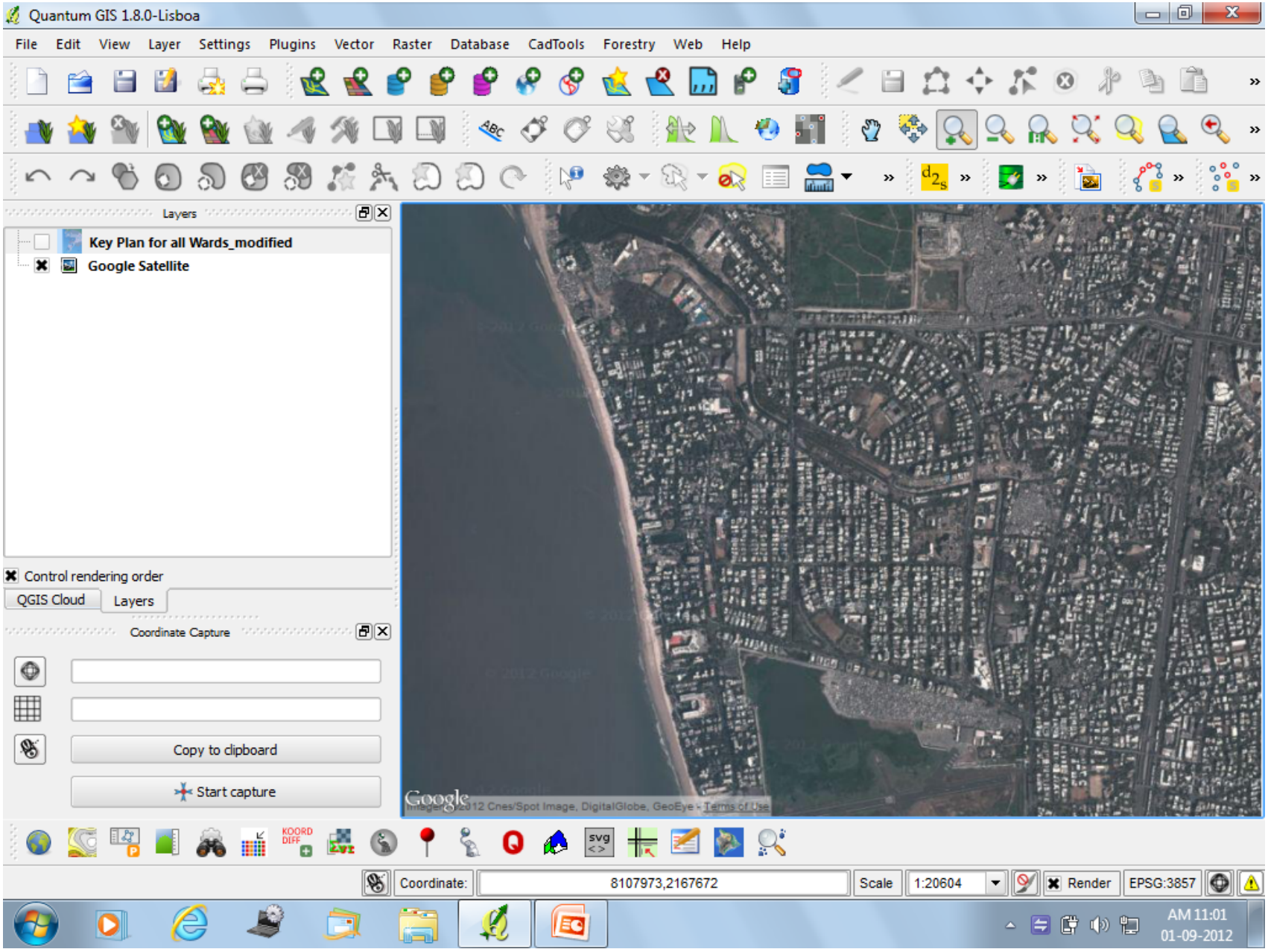
Click on ‘View’, then ‘Panels’ and click on ‘Coordinate Capture’. This will ensure a Coordinate Capture panel will get enabled under Layer Legend box.



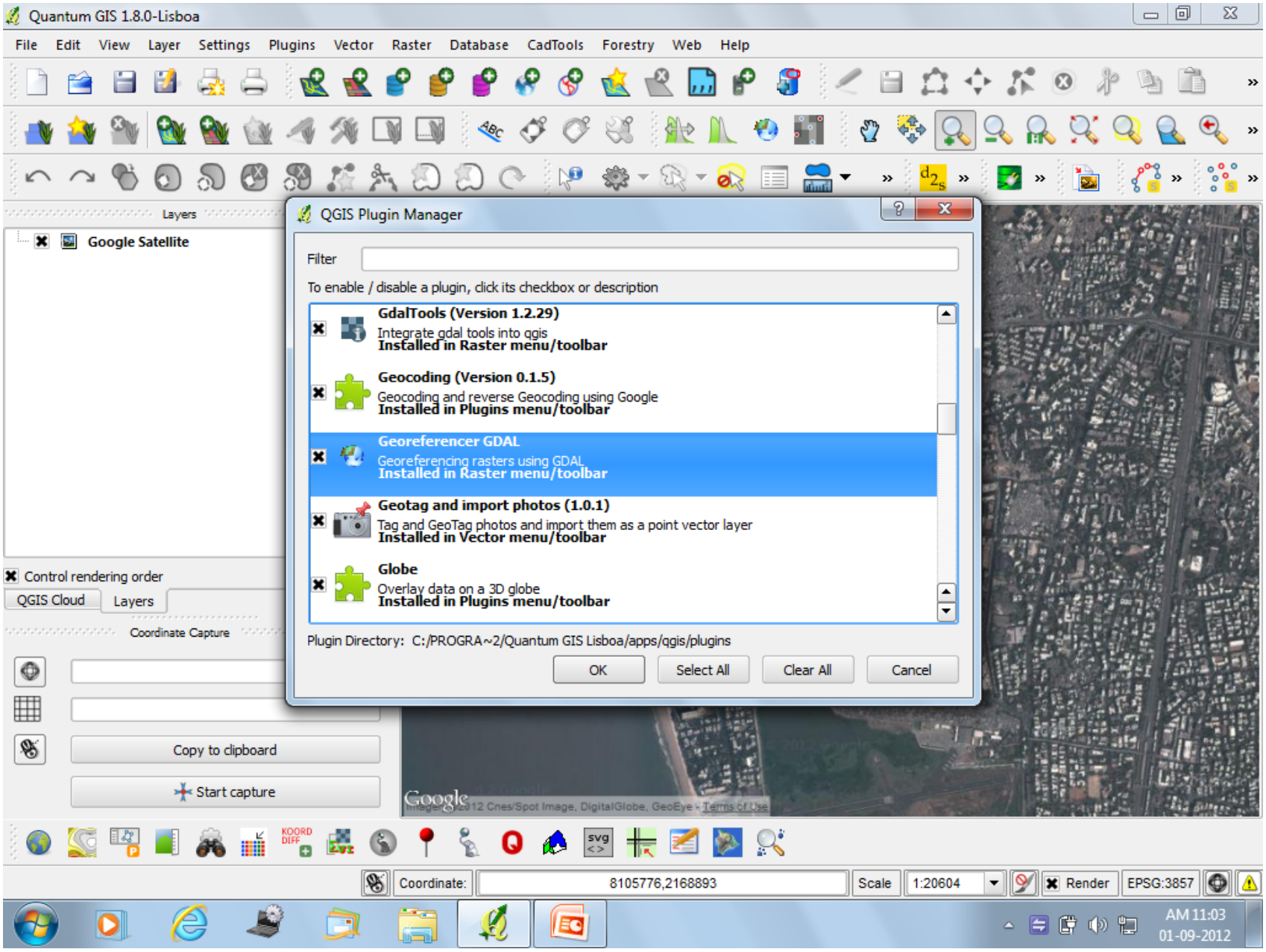
The Coordinate Capture panel will now be shown under Layer Legend box.



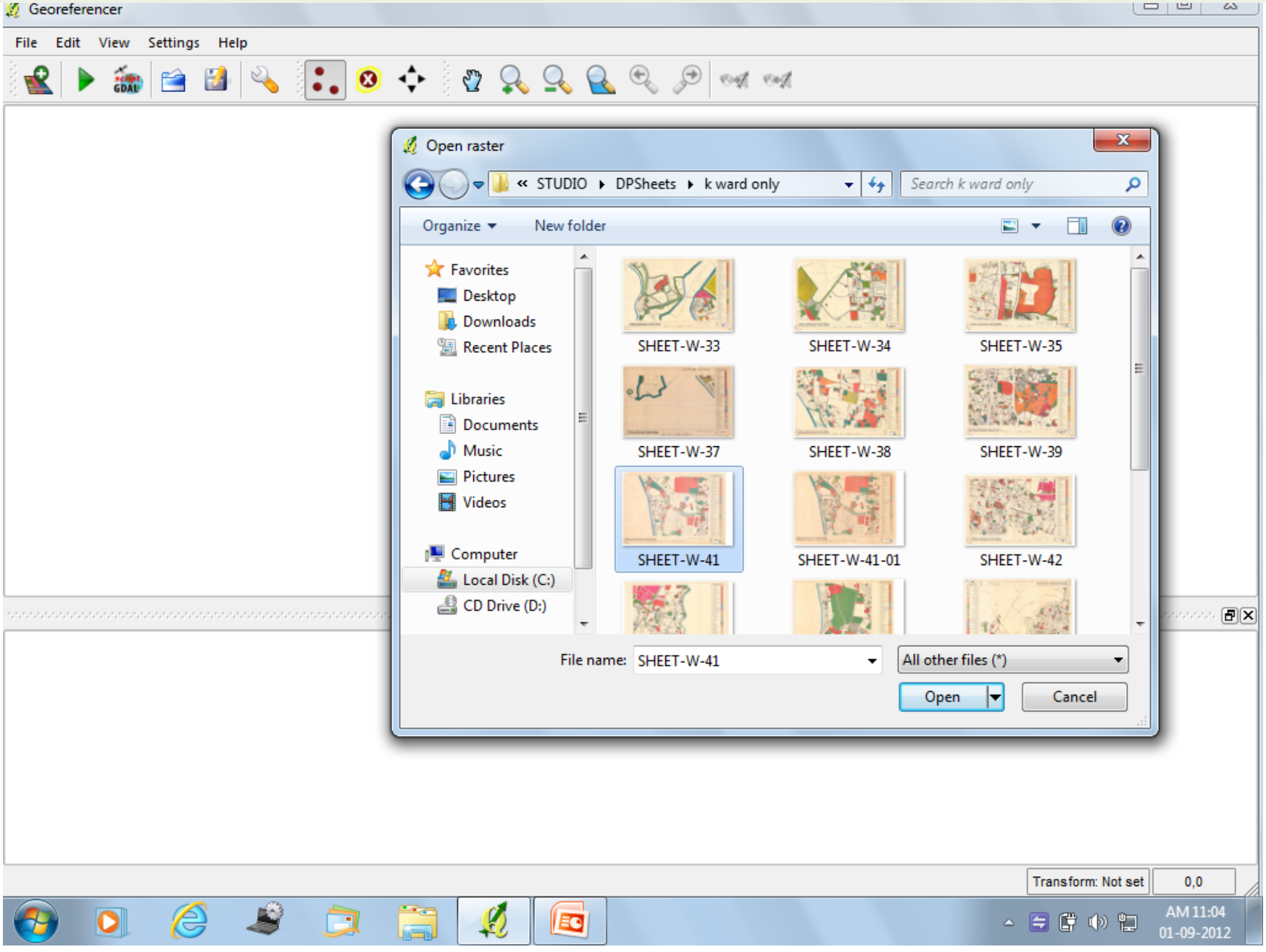
Now you can close the loaded Geo-referenced Raster or Vector so that only the Google Earth layer below is visible.



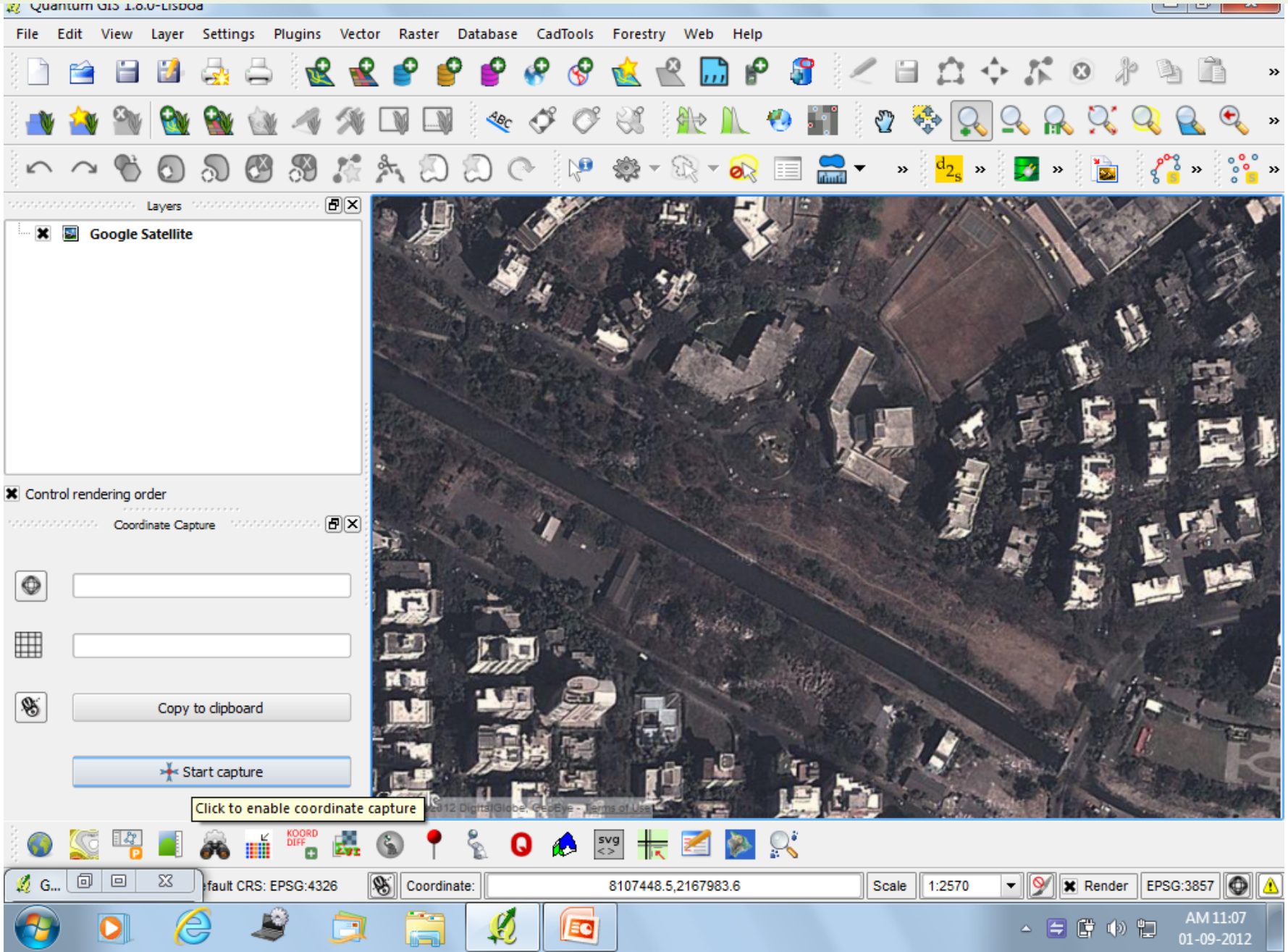
Click on ‘Plugins’ then ‘Manage Plugins’ and make sure ‘Georeferencer GDAL’ is checked. This will ensure that its icon is there in the QGIS toolbar.



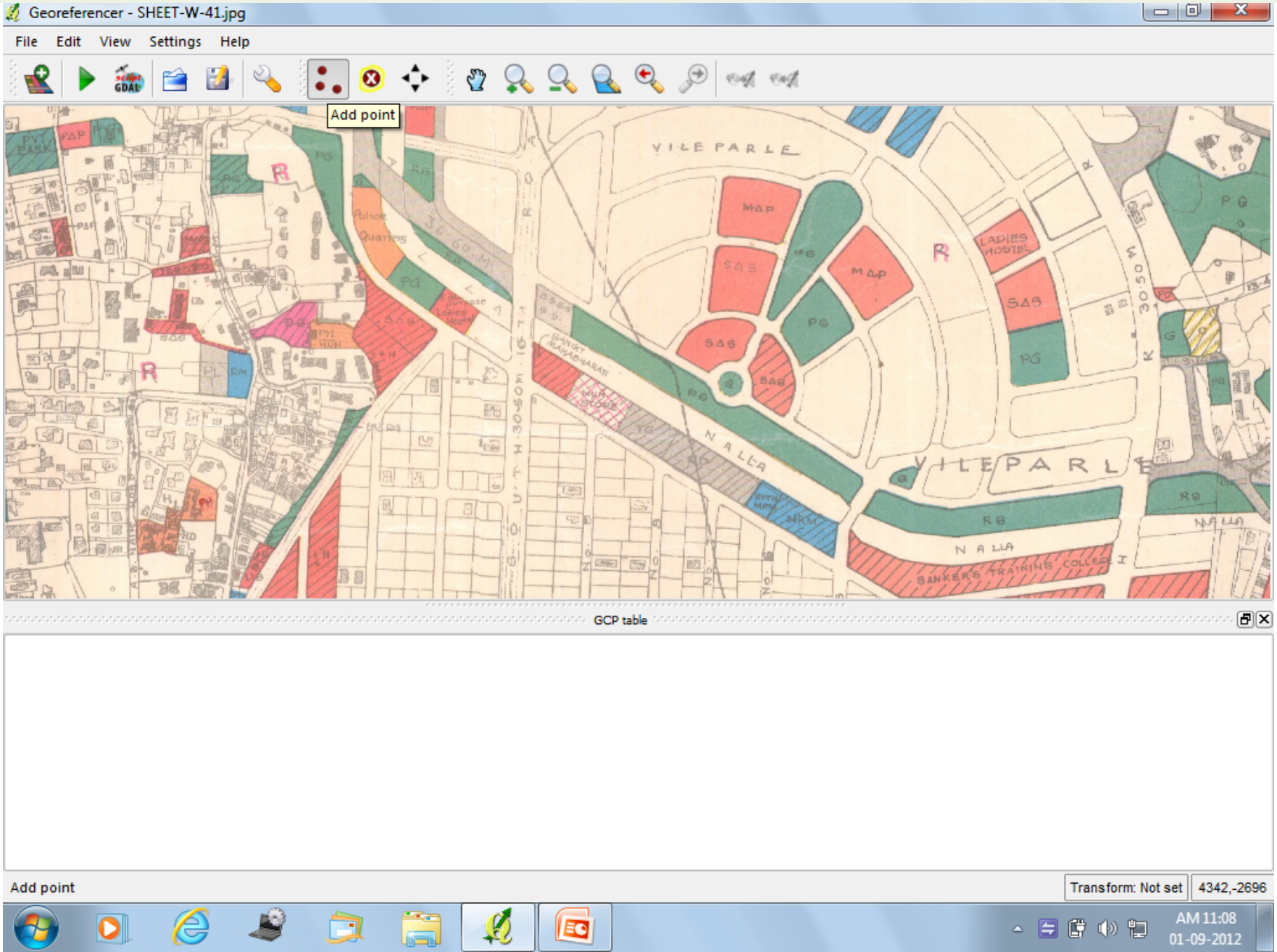
Click on the ‘Georeferencer’ icon in the toolbar and the ‘Georeferencer Window’ opens.
Click on ‘Open Raster’ and select the JPEG map you want to georeference. And click ‘Open’.



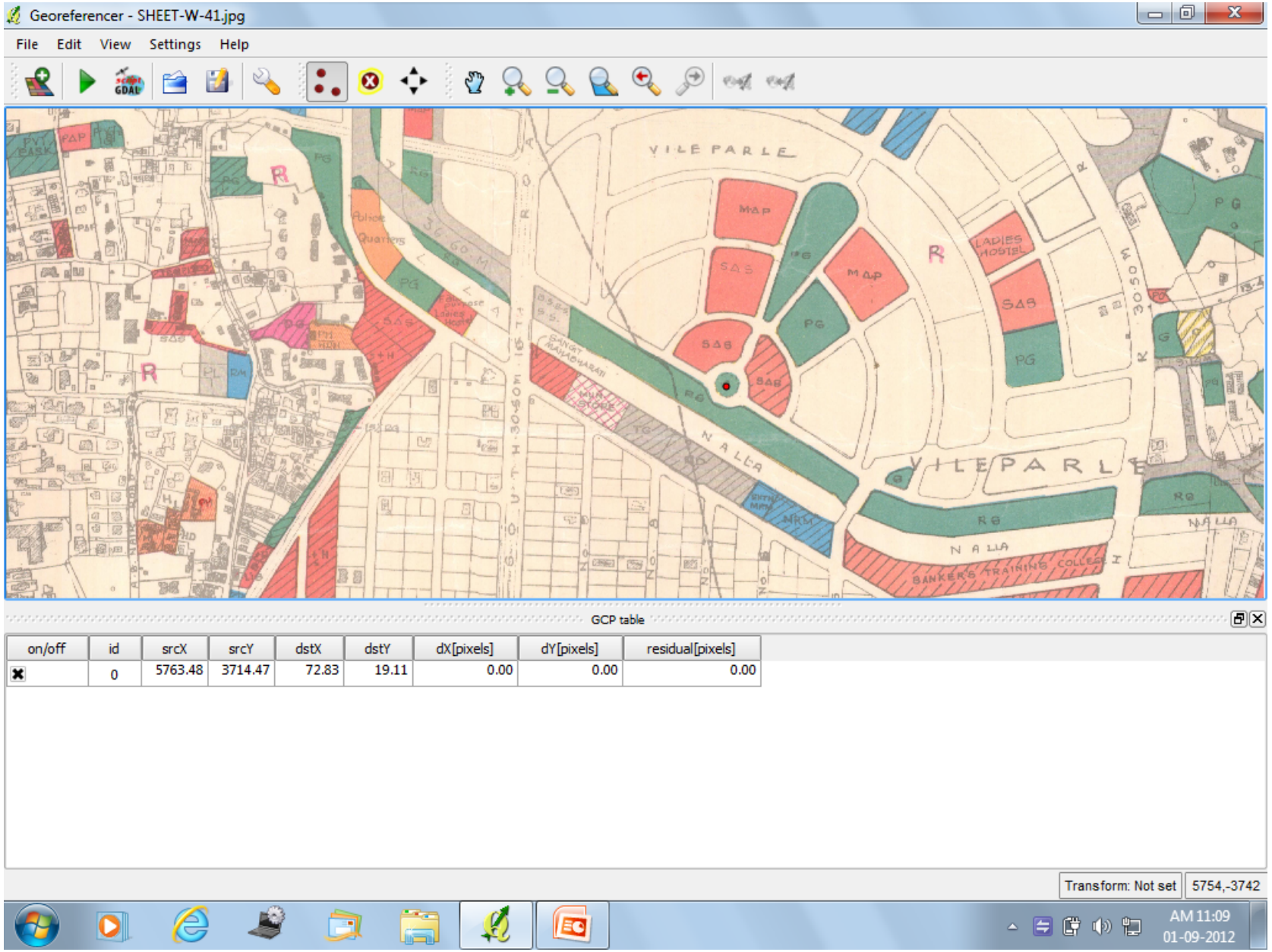
Minimise the Georeferencer Window and zoom to an area from where you want to pick the first point.



Maximise the Georeferencer Window and click on ‘Add Point’. The cursor turns into a ‘+’ sign. Click on a point in the map.



After you add a point on the map, enter the Lat Long for that point and click ok. Locate atleast 5 such points and make sure that they are spread out.



Georeferencer - SHEET-W-41.jpg

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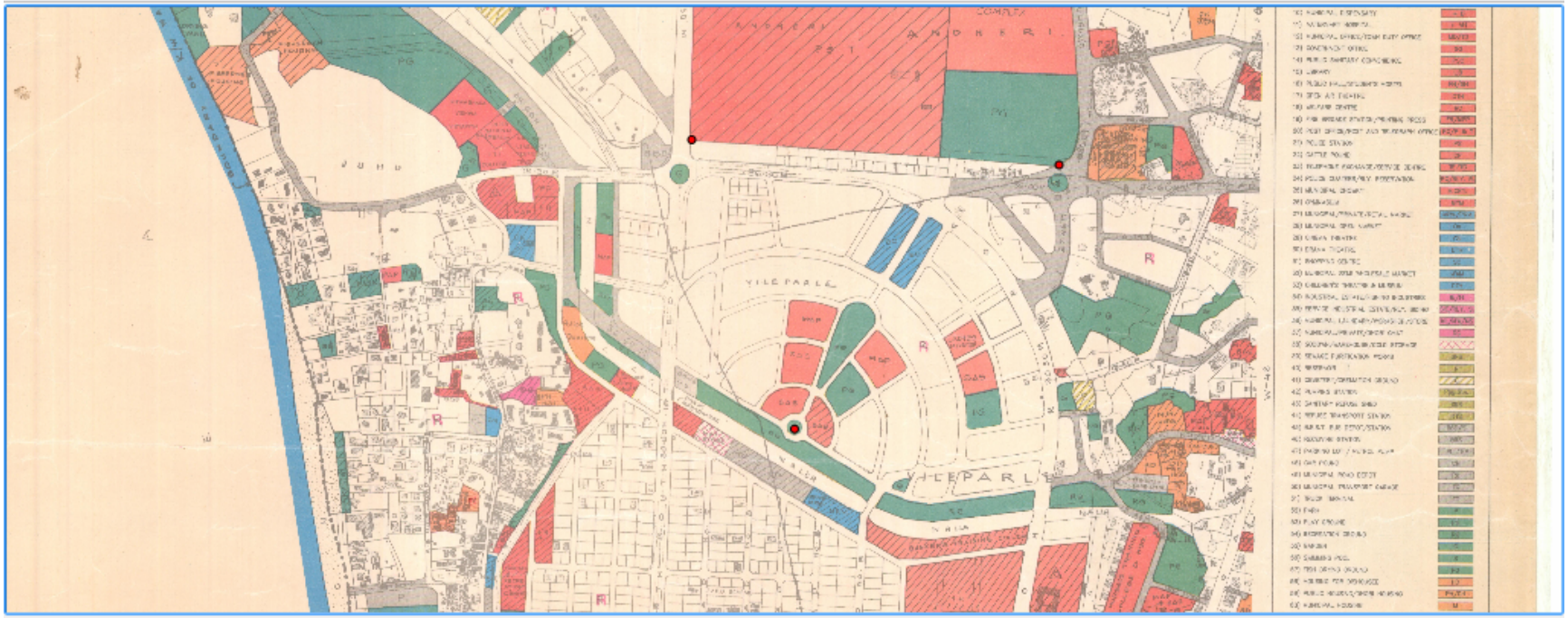

GCP table

on/off	id	srcX	srcY	dstX	dstY	dX[pixels]	dY[pixels]	residual[pixels]
✖	0	5763.48	3714.47	72.83	19.11	0.00	0.00	0.00
✖	1	5152.32	1996.44	72.83	19.12	0.00	0.00	0.00
✖	2	3015.54	891.83	72.83	19.12	0.00	0.00	0.00
✖	3	3875.69	5790.13	72.83	19.10	0.00	0.00	0.00
✖	4	5808.75	6086.66	72.83	19.10	0.00	0.00	0.00
✖	5	7334.37	2145.84	72.83	19.12	0.00	0.00	0.00

Transform: Not set | 4600,-3205

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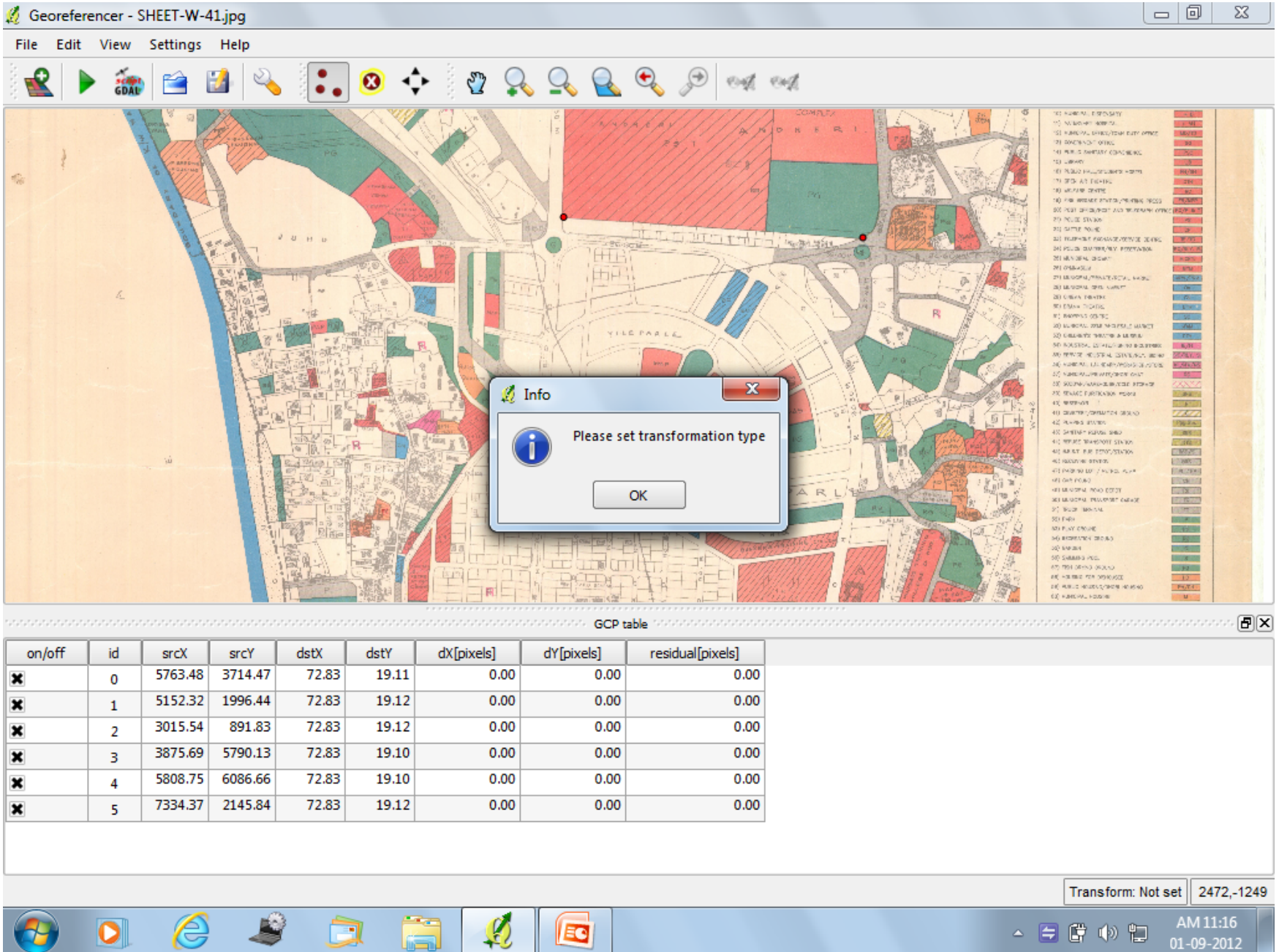
After you are done adding all the points click on ‘Georeference’ that will ask you to set the ‘Transformation Type’. Click ‘Ok’ and select the settings.



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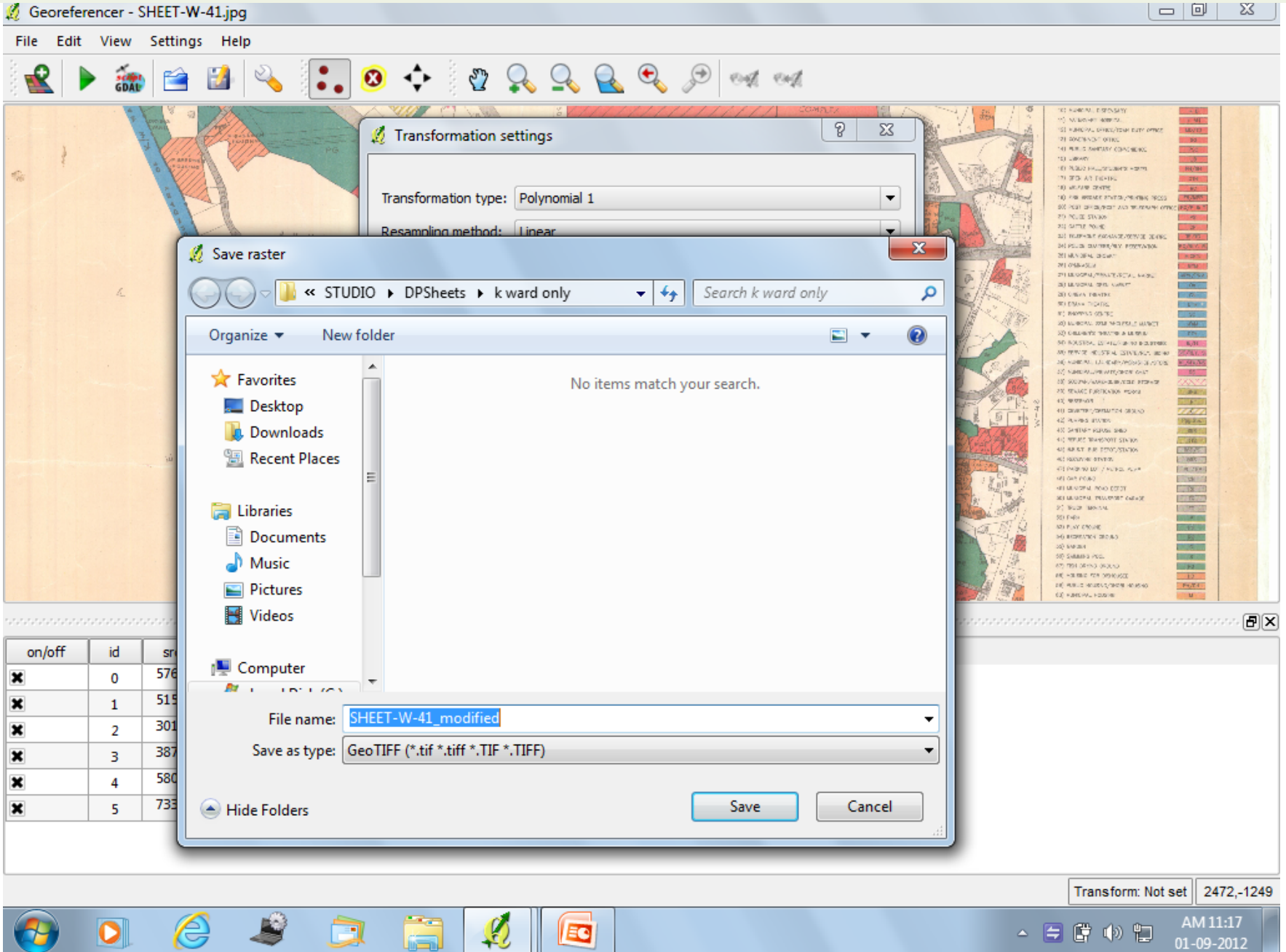
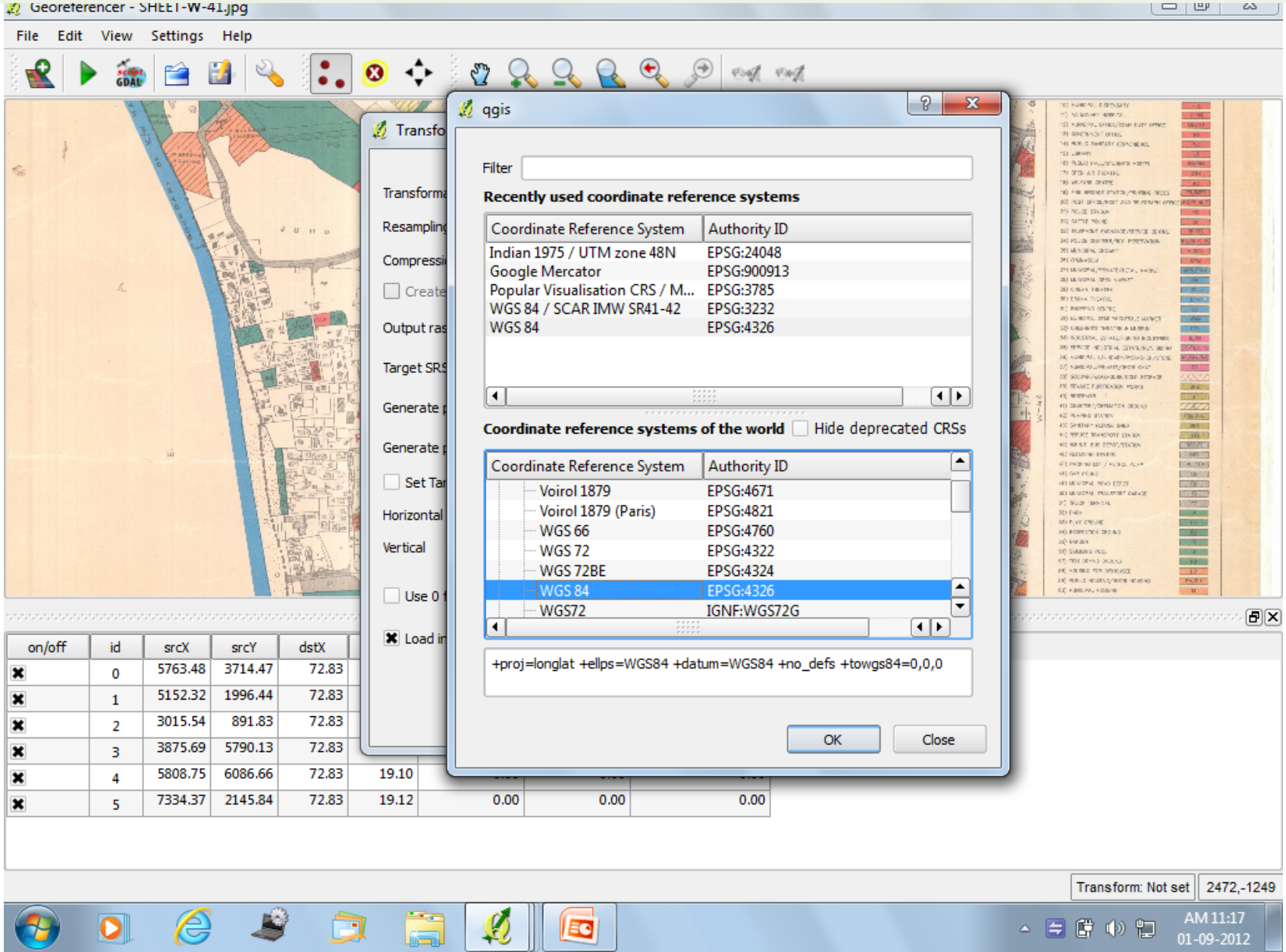
✖	5	7334.37	2145.84	72.83	19.12	0.00	0.00	0.00

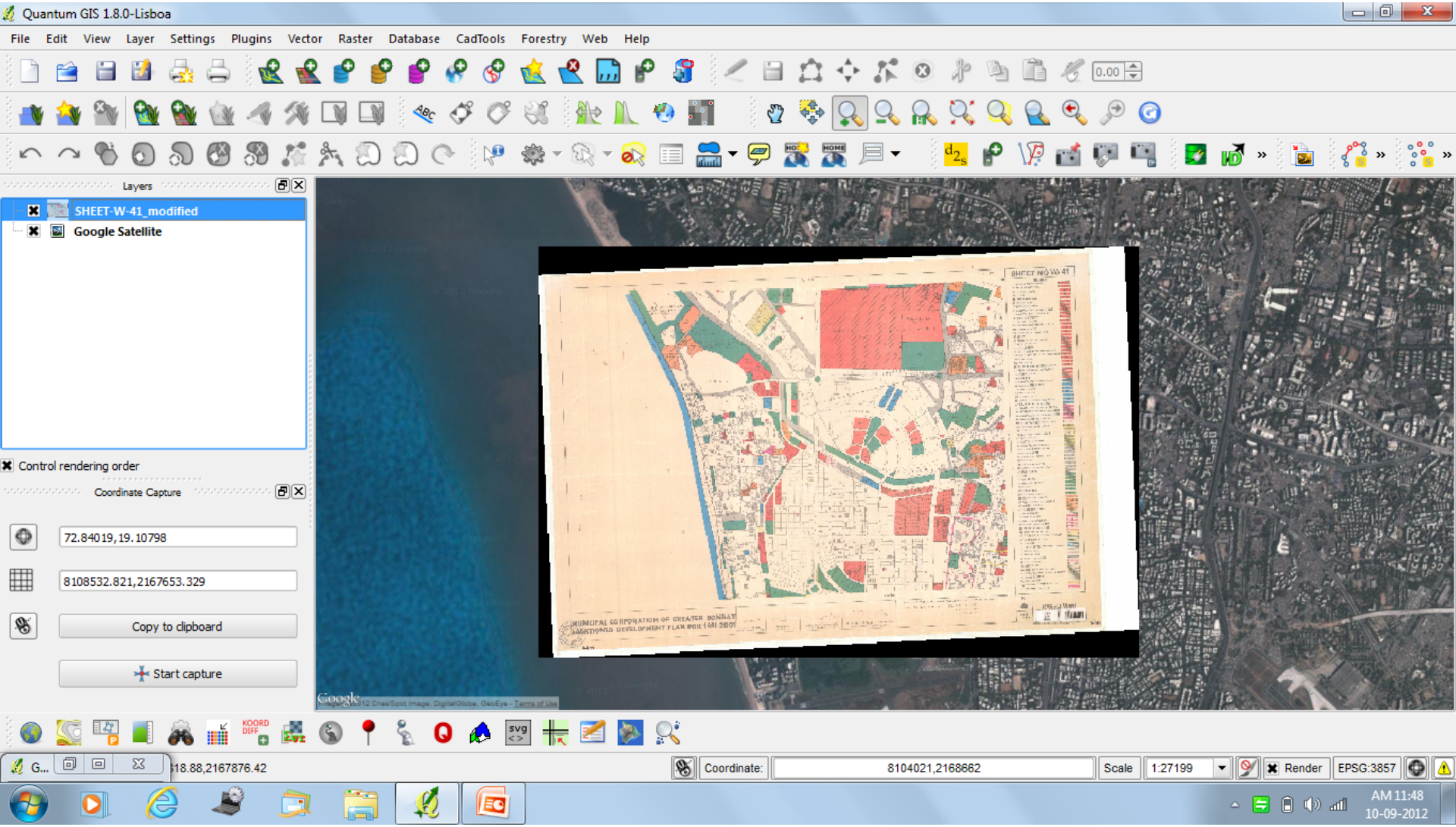
Save the georeferenced output file at a preferred location, save file type as ‘geotiff’ and click on ‘save.



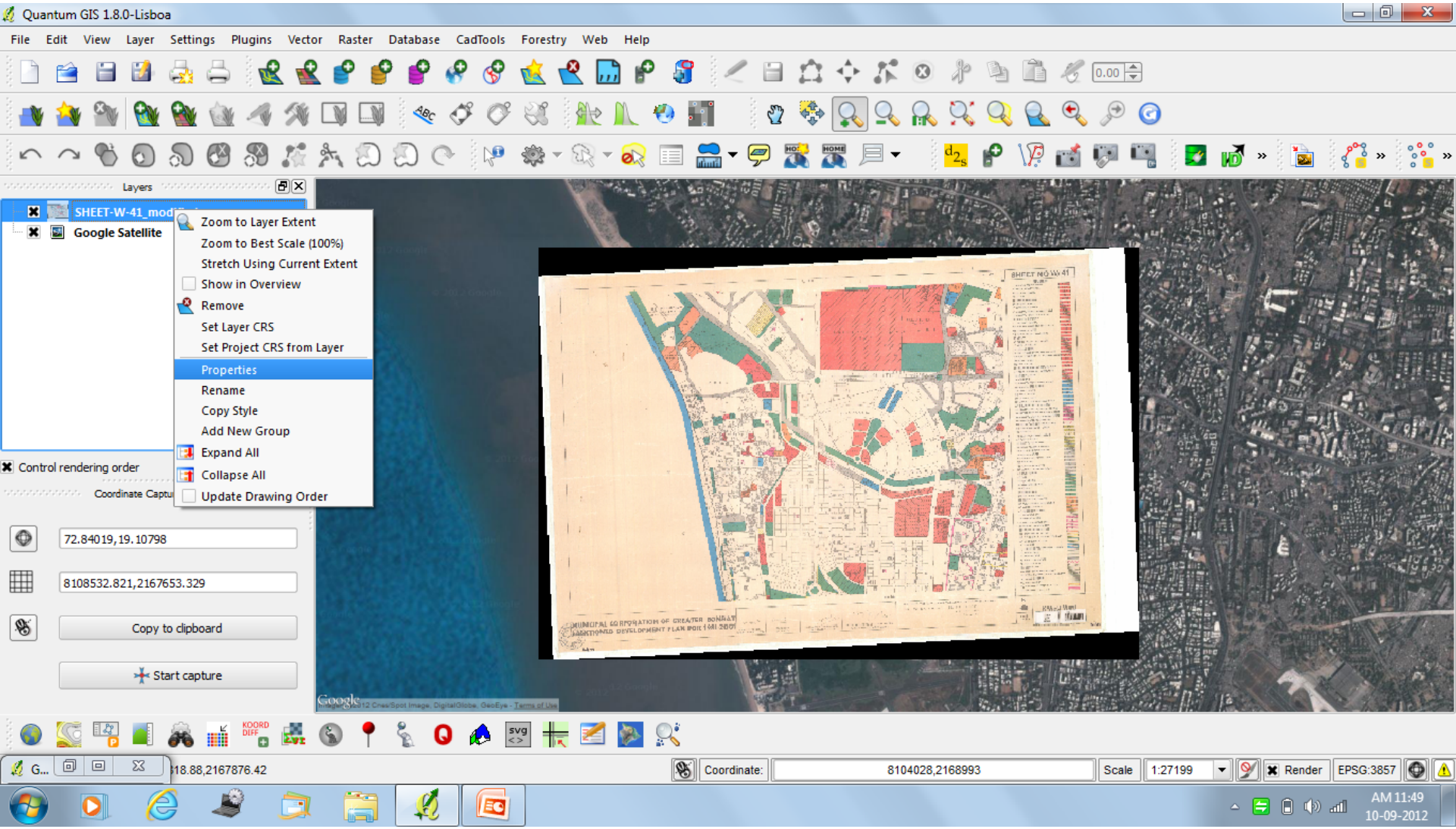
Make sure you CRS is WGS84 and click ‘Ok’. Check on ‘Load in QGIS when Done’ and click ‘Ok. You will see the progress bar of georeferencing as it happens. After it finishes, minimise the Georeferencer Window.



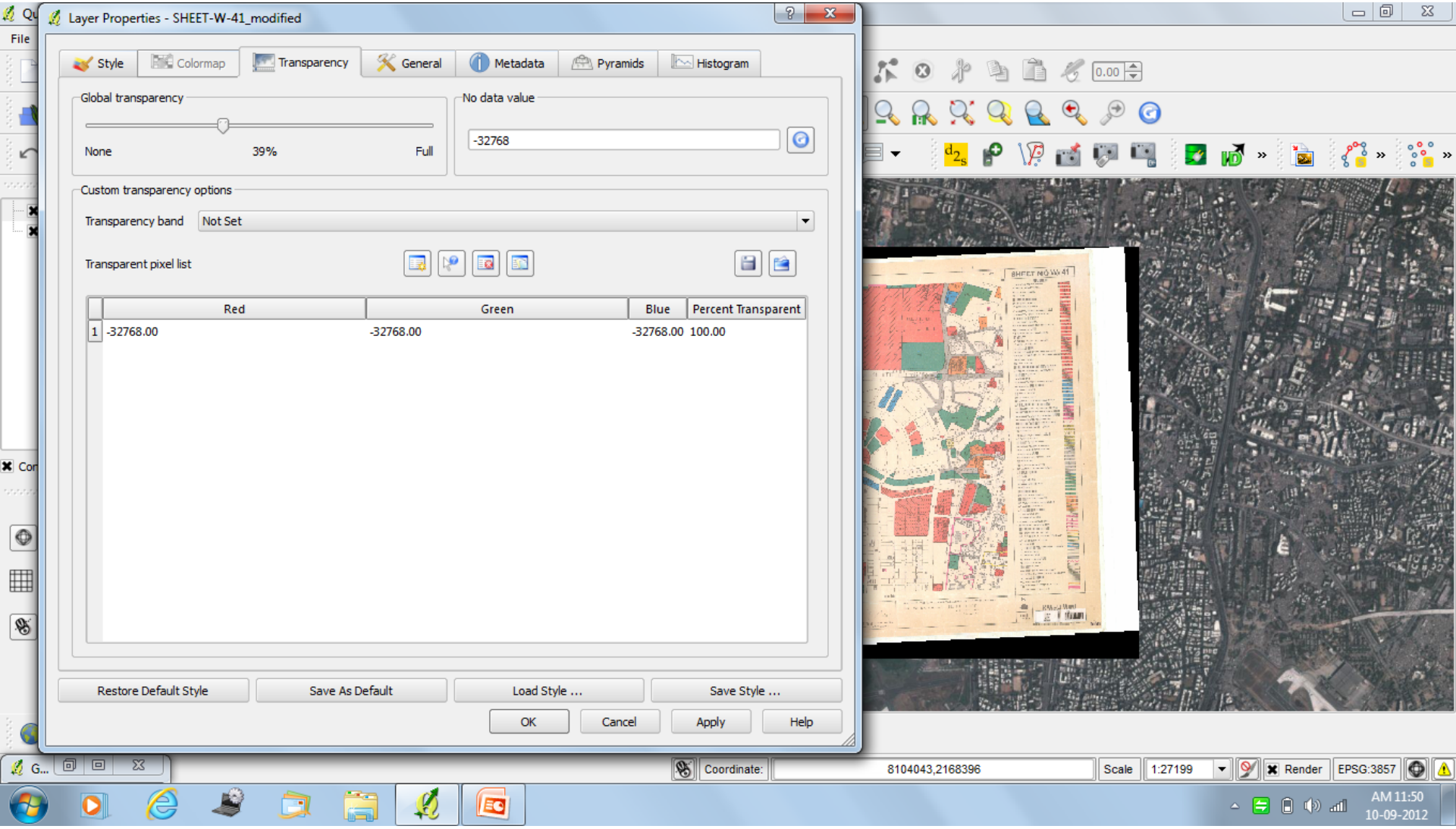
Now you can see the Georeferenced Rater map in the main window.



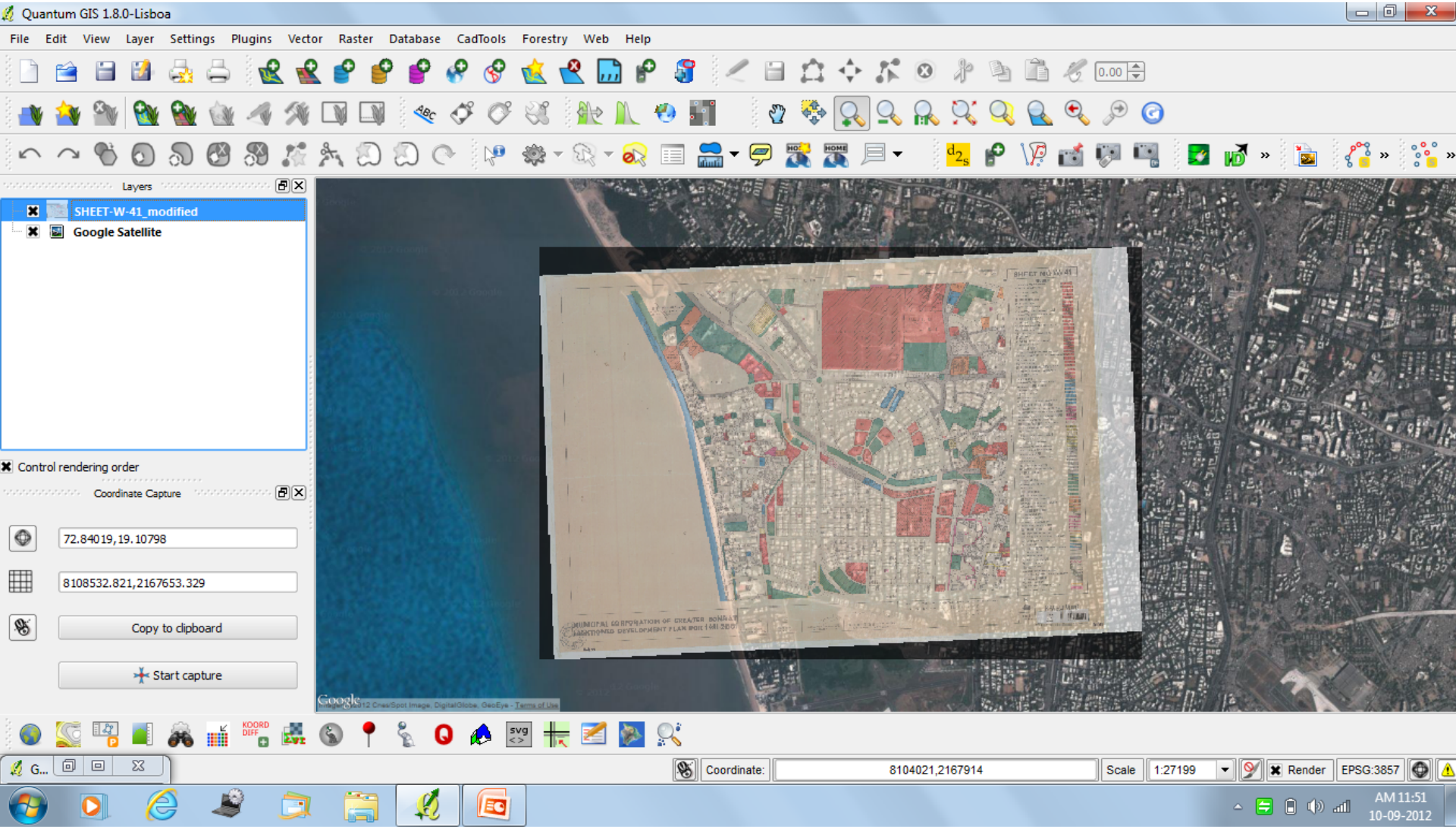
Right Click on the Raster layer and click on ‘Properties’.



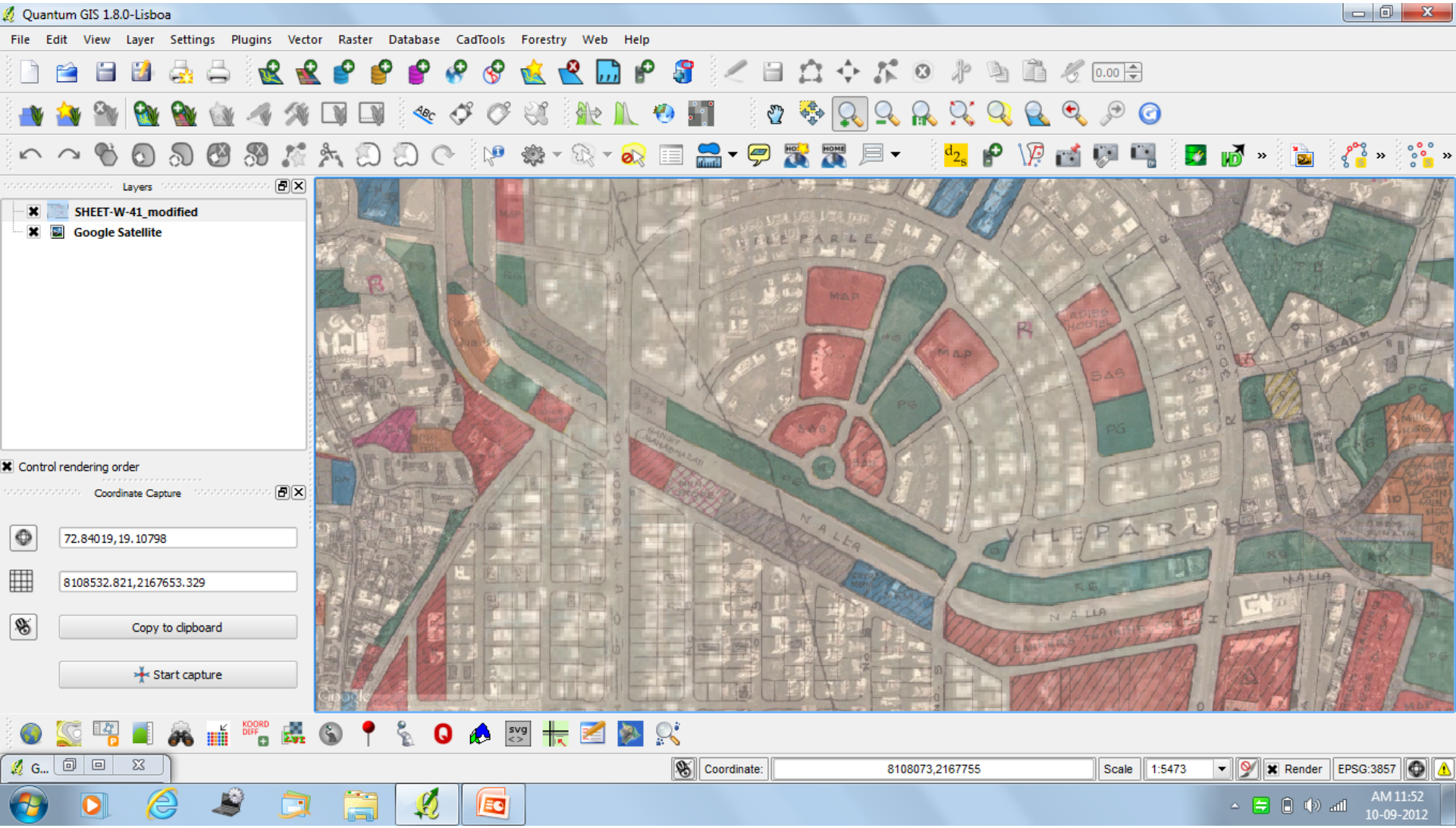
Change the Transparency to the desired level and click ‘Ok’.

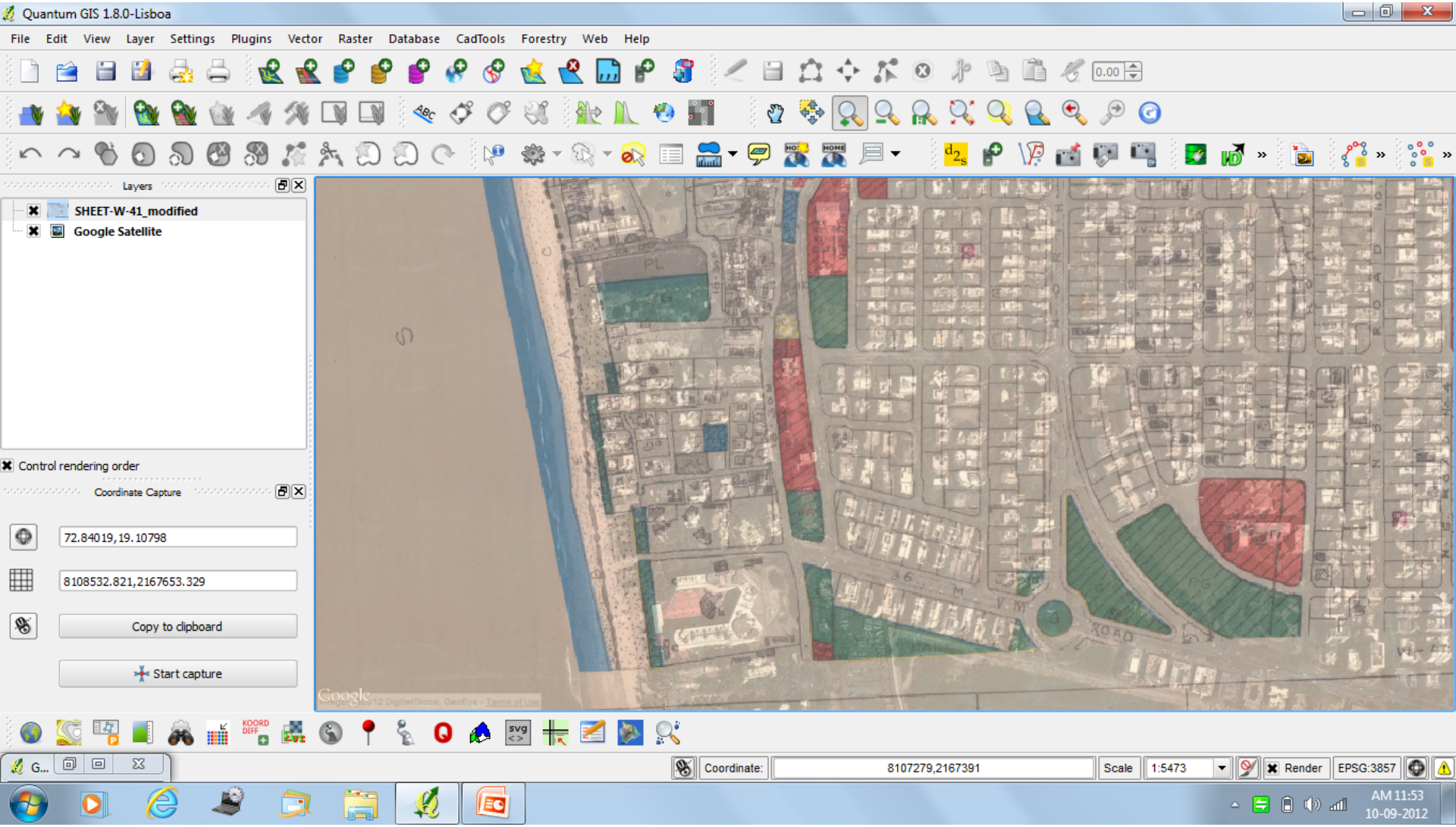


Now you can see both the map and the Google Earth layer under it.



Now you can zoom to certain areas on the map to check if the Georeferencing has happened correctly.

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File Edit View Layer Settings Plugins Vector Raster Database CadTools Forestry Web Help
Layers
SHEET-W-41_modified
Google Satellite
Control rendering order
Coordinate Capture
72.84019,19.10798
8108532.821,2167653.329
Copy to clipboard
Start capture
Google
Coordinate:
8107279,2167391
Scale
1:5473
Render
EPSG:3857
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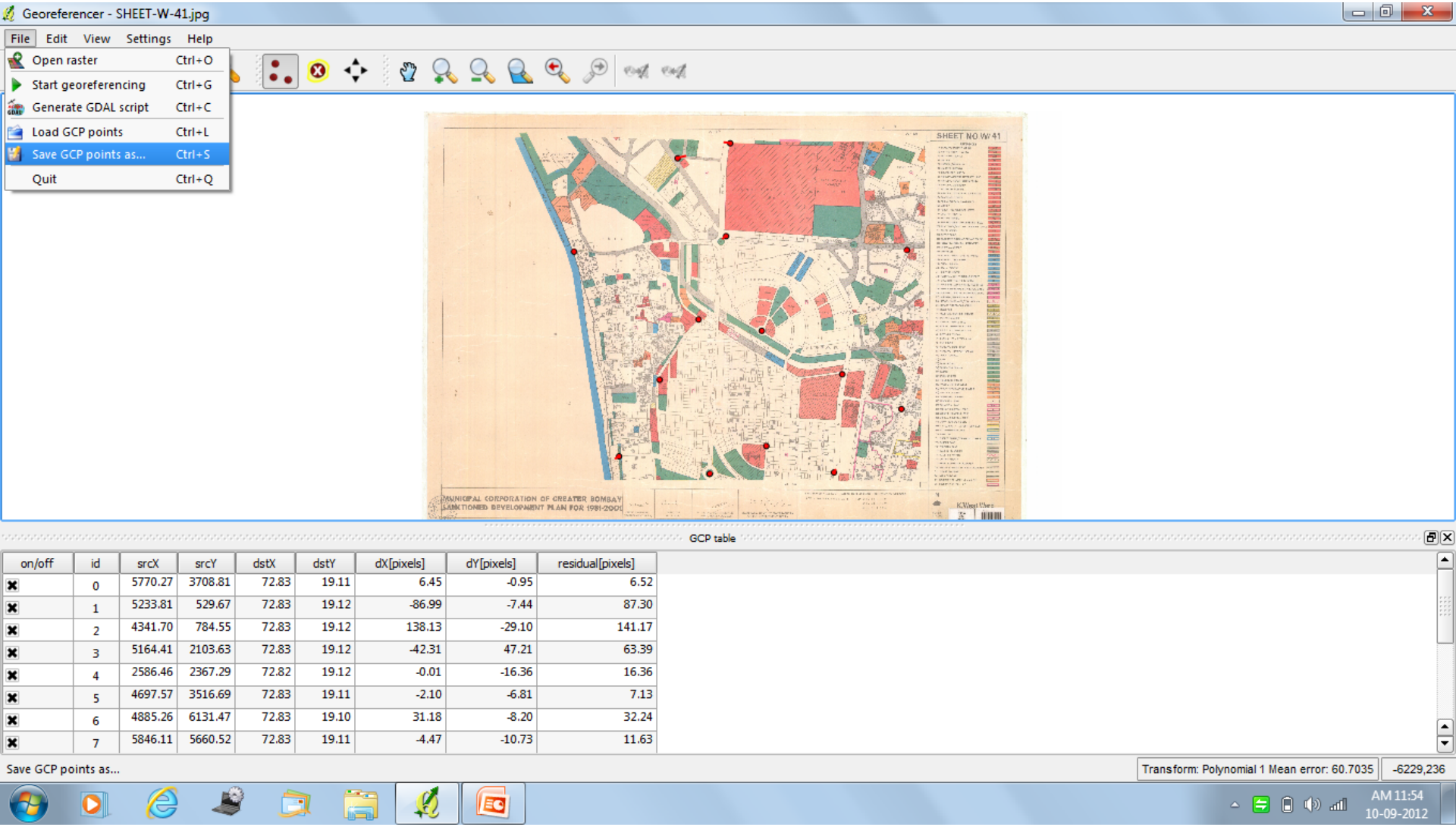
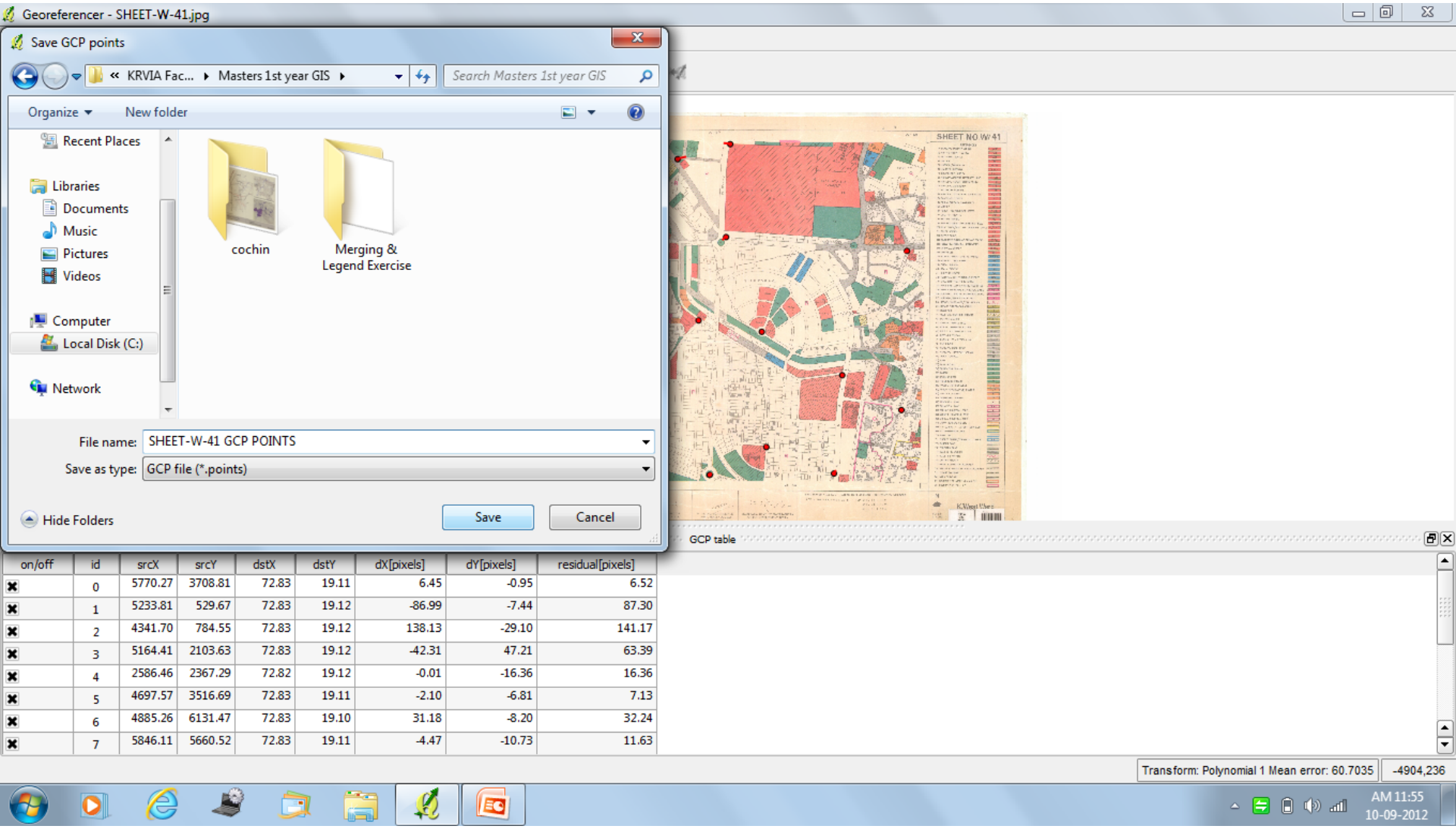
If you are satisfied with the level of accuracy maximise the Georeferencer window click on ‘File’ and then ‘Save GCP Points as’.



on/off	id	srcX	srcY	dstX	dstY	dX[pixels]	dY[pixels]	residual[pixels]
✖	0	5770.27	3708.81	72.83	19.11	6.45	-0.95	6.52
✖	1	5233.81	529.67	72.83	19.12	-86.99	-7.44	87.30
✖	2	4341.70	784.55	72.83	19.12	138.13	-29.10	141.17
✖	3	5164.41	2103.63	72.83	19.12	-42.31	47.21	63.39
✖	4	2586.46	2367.29	72.82	19.12	-0.01	-16.36	16.36
✖	5	4697.57	3516.69	72.83	19.11	-2.10	-6.81	7.13
✖	6	4885.26	6131.47	72.83	19.10	31.18	-8.20	32.24
✖	7	5846.11	5660.52	72.83	19.11	-4.47	-10.73	11.63

Save the GCP file type at a preferred location so that you can load them again for future reference.



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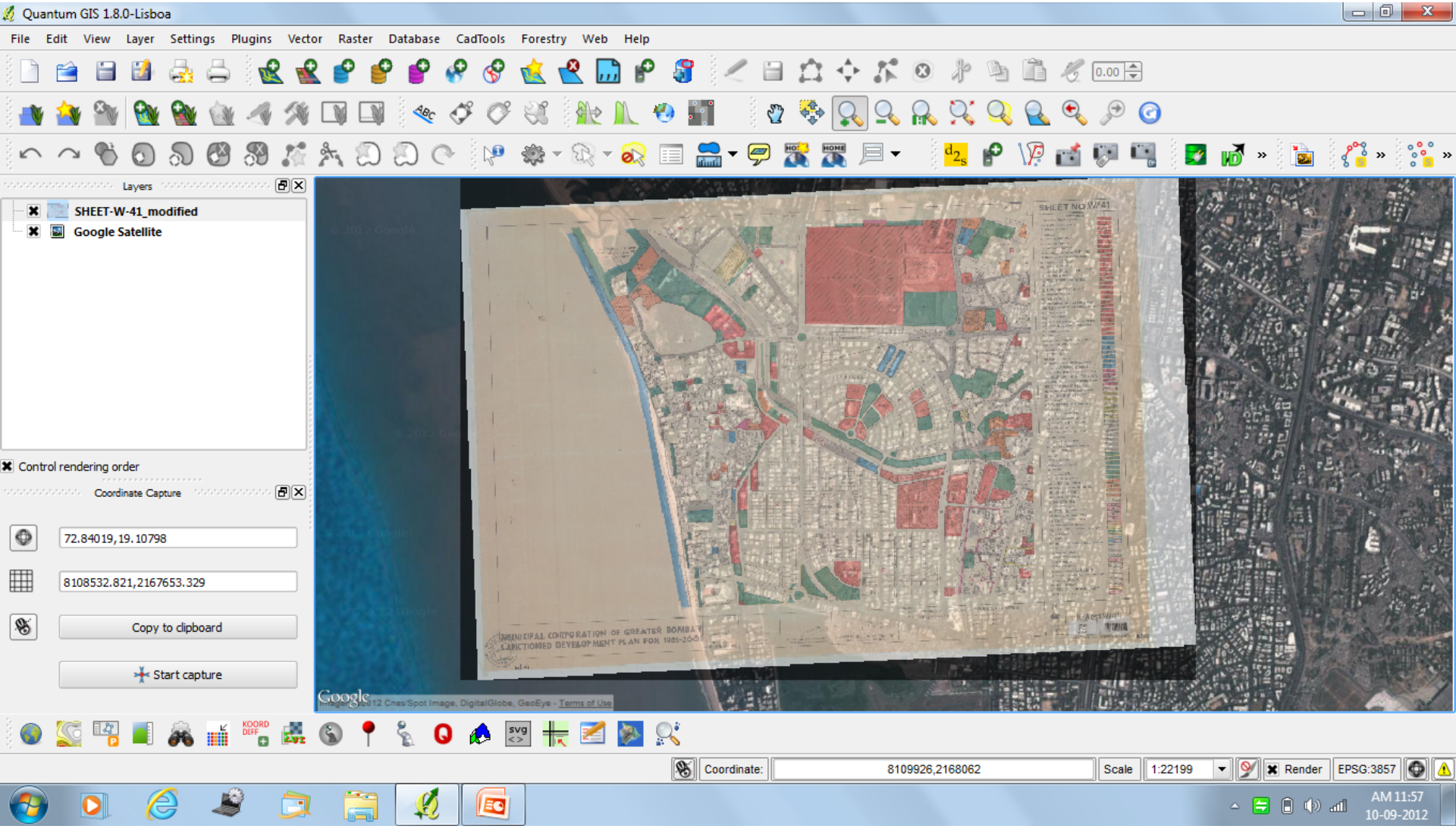
✖	7	5846.11	5660.52	72.83	19.11	-4.47	-10.73	11.63

After saving the GCP points close the Georeferencer window to return to your main window of QGIS.



The Georeferenced raster can now be used for multiple purposes such as:-

- **Overlaying it with real conditions to understand disparity.**
- **Calculating Areas or Linear Distances.**
- **Creating new vector layers based on the georeferenced map.**
- **Finding out geographic coordinates of desired places on the map.**