CE203: Geospatial Engineering

Assignment 3: Wetland Conservation

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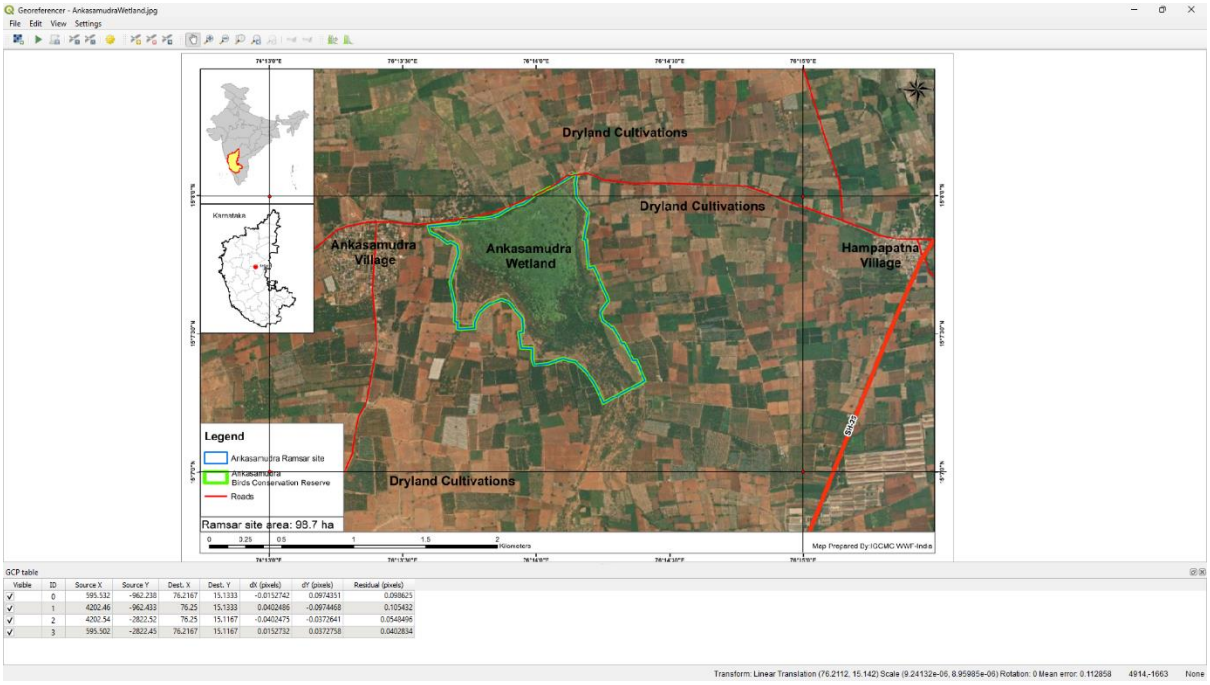
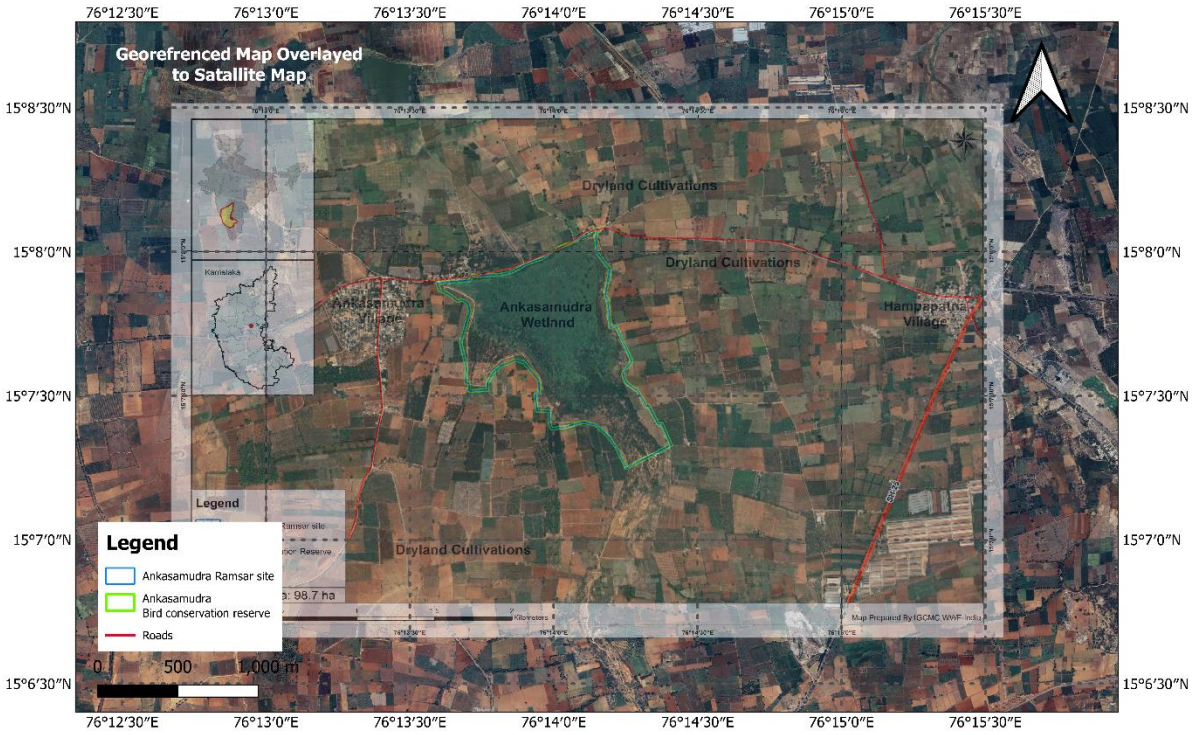
- **In this work, perform geo-referencing operations for the Ankasamudra wetland region, digitize the bird conservation reserve, and estimate its area. Also, digitize the roads given in the map.**

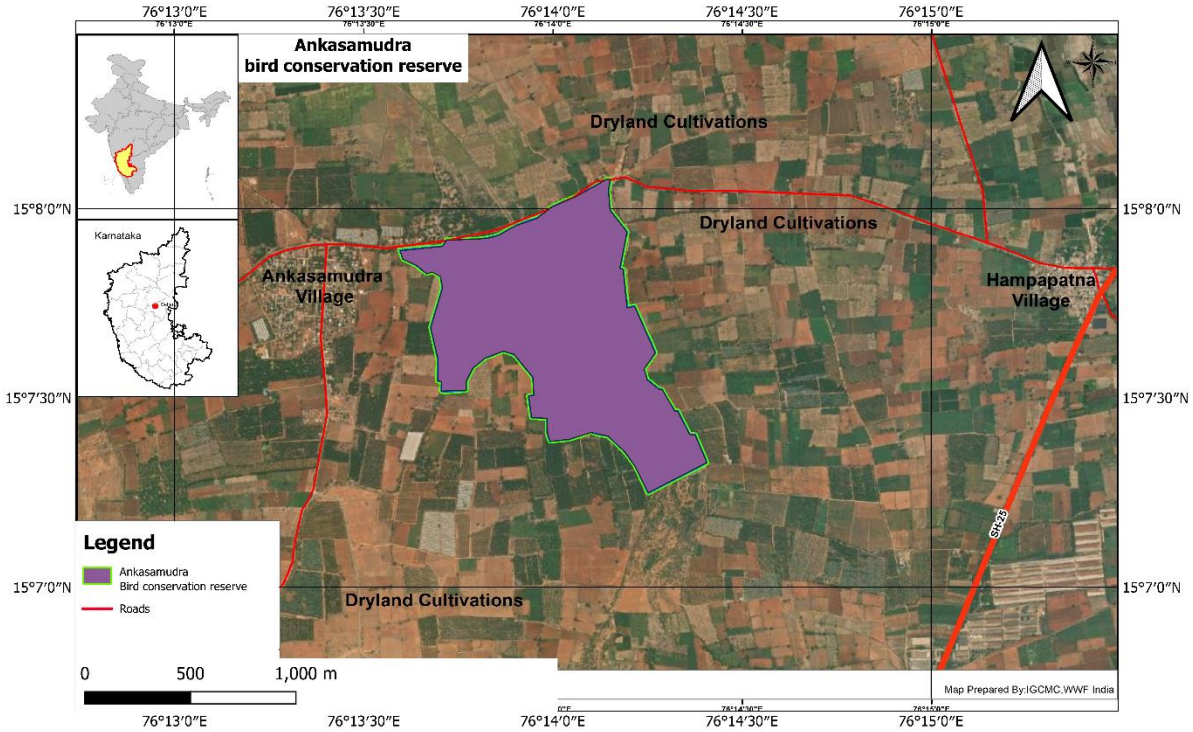
First, go to the “Raster” tab and select the “Georeferencing” option to perform georeferencing. A new window pops up. Select the layer you want to work with, then click on “Add Point” and add a minimum of 3 points (but it's good practice to add all points whose coordinates data is available). Then, apply transformation settings and start georeferencing.



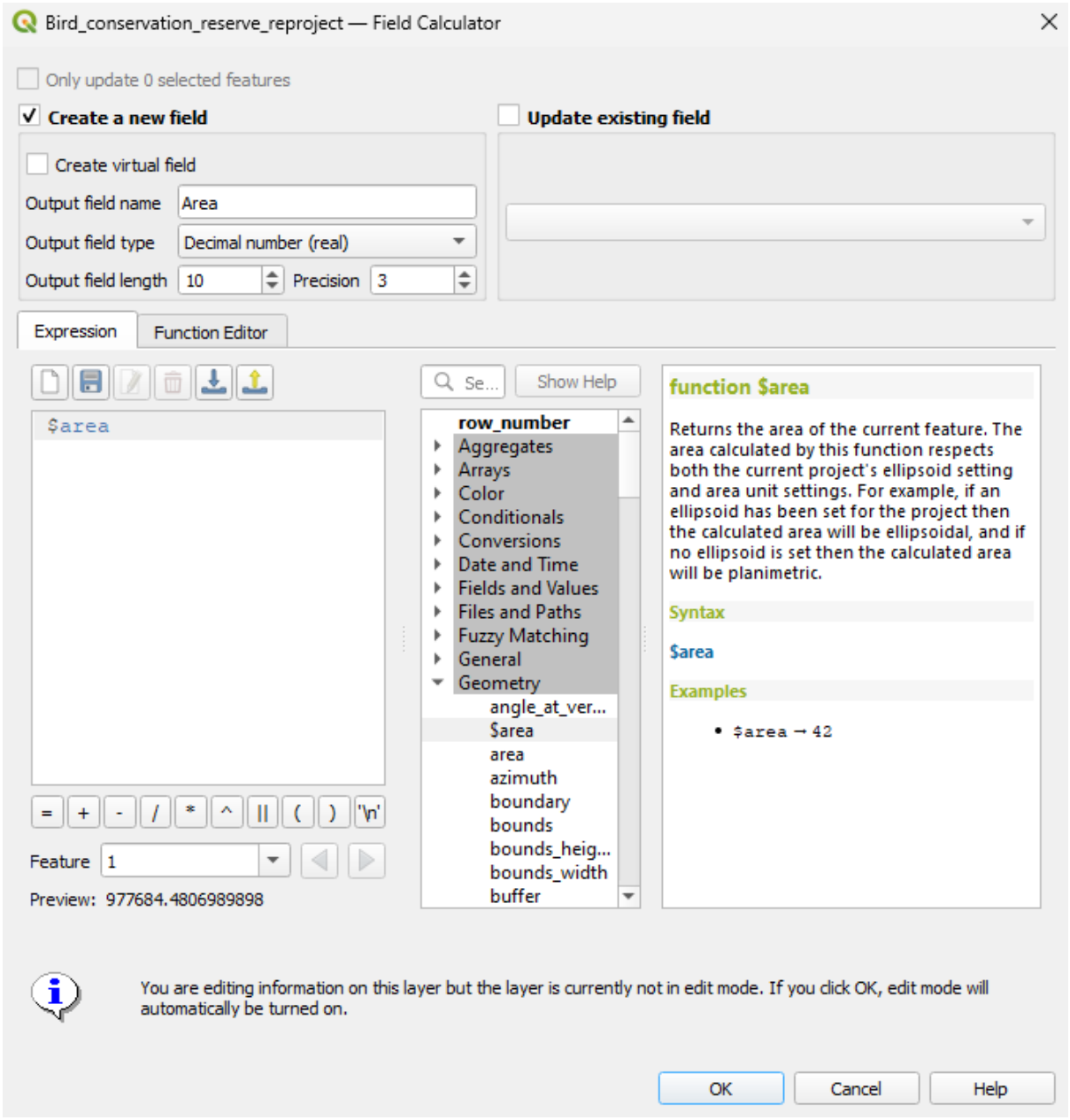
After georeferencing since the dX and dY values are very low this means that accuracy while adding the points is very high.
To show the geo-referenced image I overlayed it with Google Satellite Map and changed its transparency to verify the georeferencing.
Also while creating the map I enabled the grids to visualize the overlaying of the coordinates of the georeferenced image with that of the Satellite Map to affirm the georeferencing.



For digitizing the Ankasamudra bird conservation reserve, I created a “New Shapefile Layer” and created a mask over the reserve.

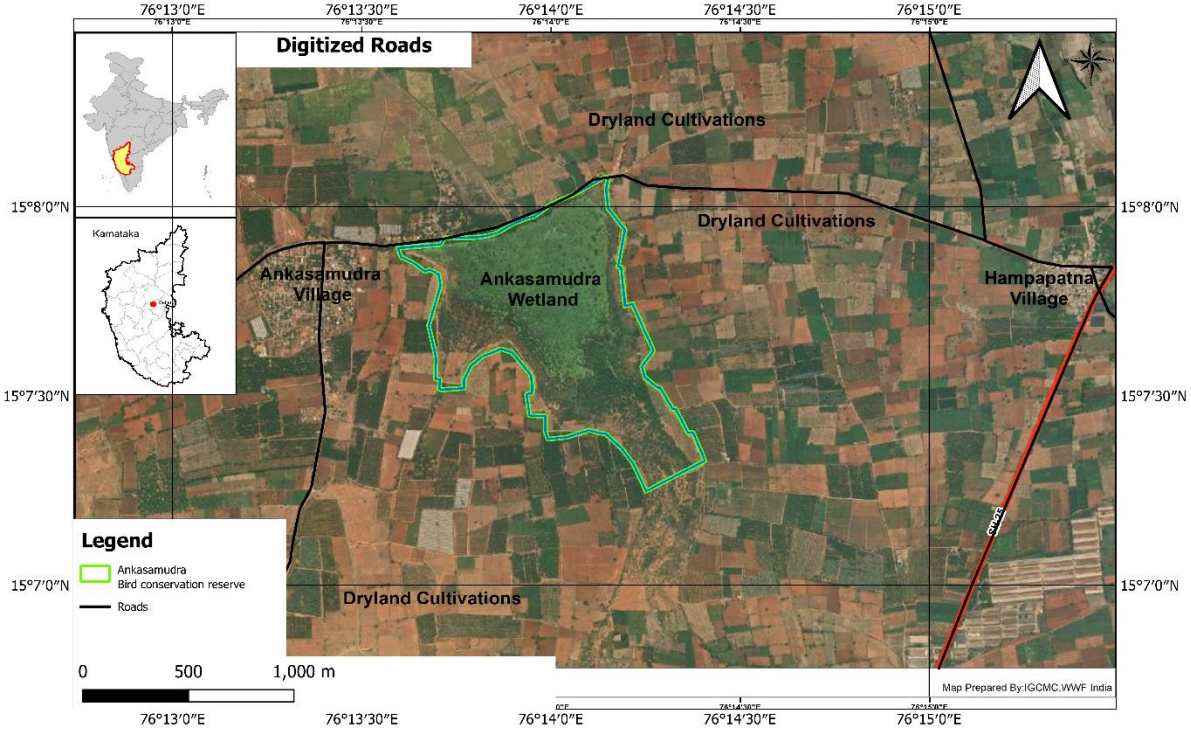


Since the Unit of the map were in degrees and we were to calculate area (metre square), so we need to convert the Unit to metre.
So, we need to reproject the newly created layer and then using the Field Calculator of the attribute table to calculate the Area of the reserve.



The area of the reserve comes out to be 977684.5 m^2 (approx.)

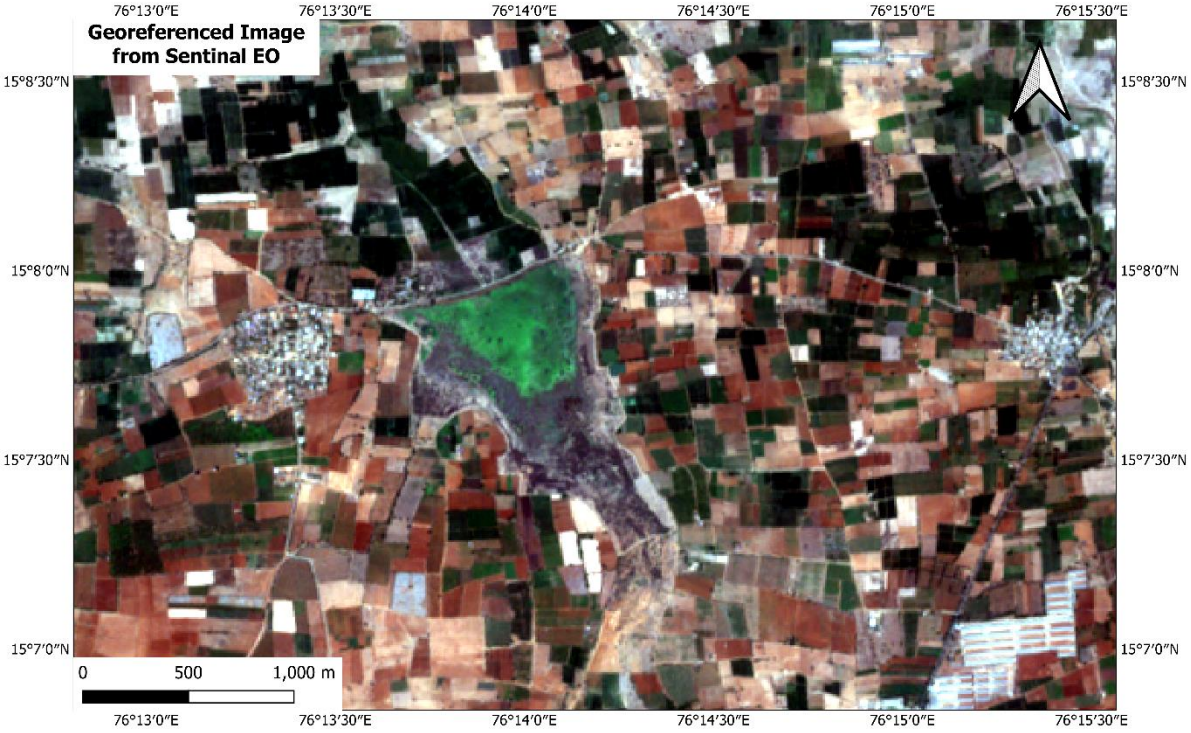
Furthermore, digitizing the roads by similarly creating new shapefile layer and tracing the roads.



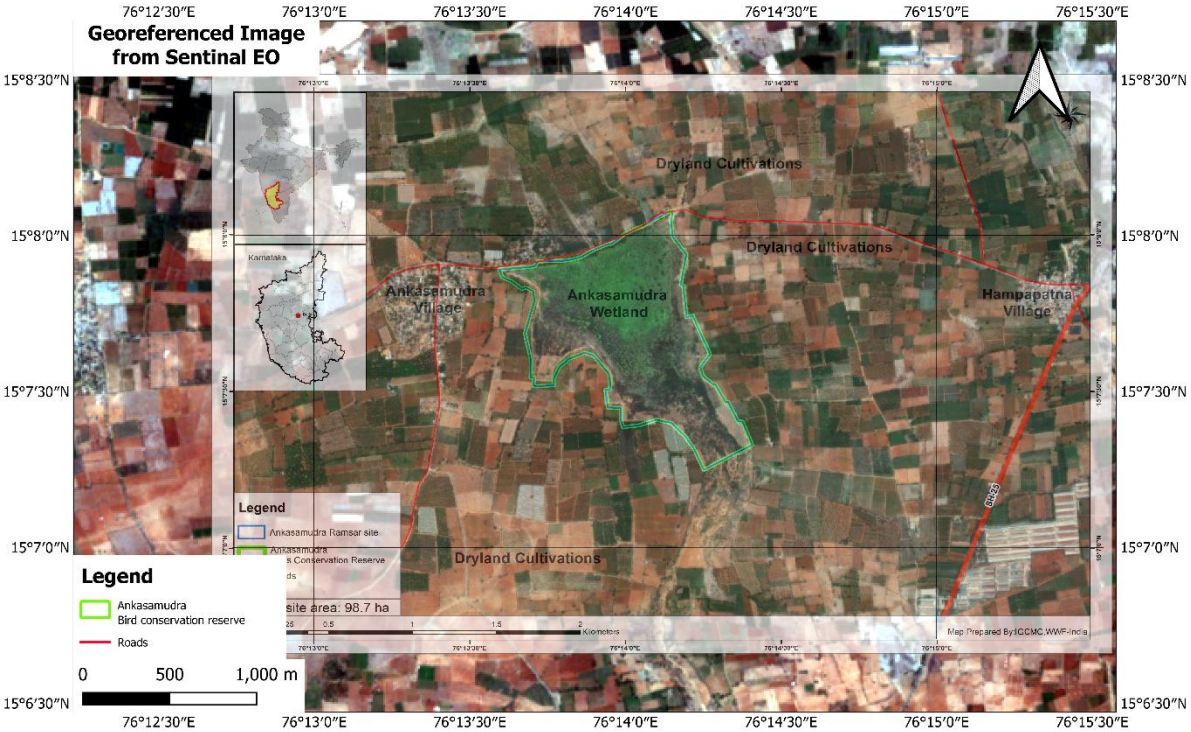
We can also estimate the total length of the road network shown in the map.
To find the length of the road network, we first need to reproject the layer to convert the units from Degrees to Metre. After reprojecting, we can use the "$length" option in the field calculator to calculate the length of different segments of the road, and then we can sum the length of all the segments to get the total length. By summing the length, we get approximately 9393 m.

- **Now, download a Georeferenced image of the area using the Sentinel-EO Browser and check the accuracy of your digitized product.**

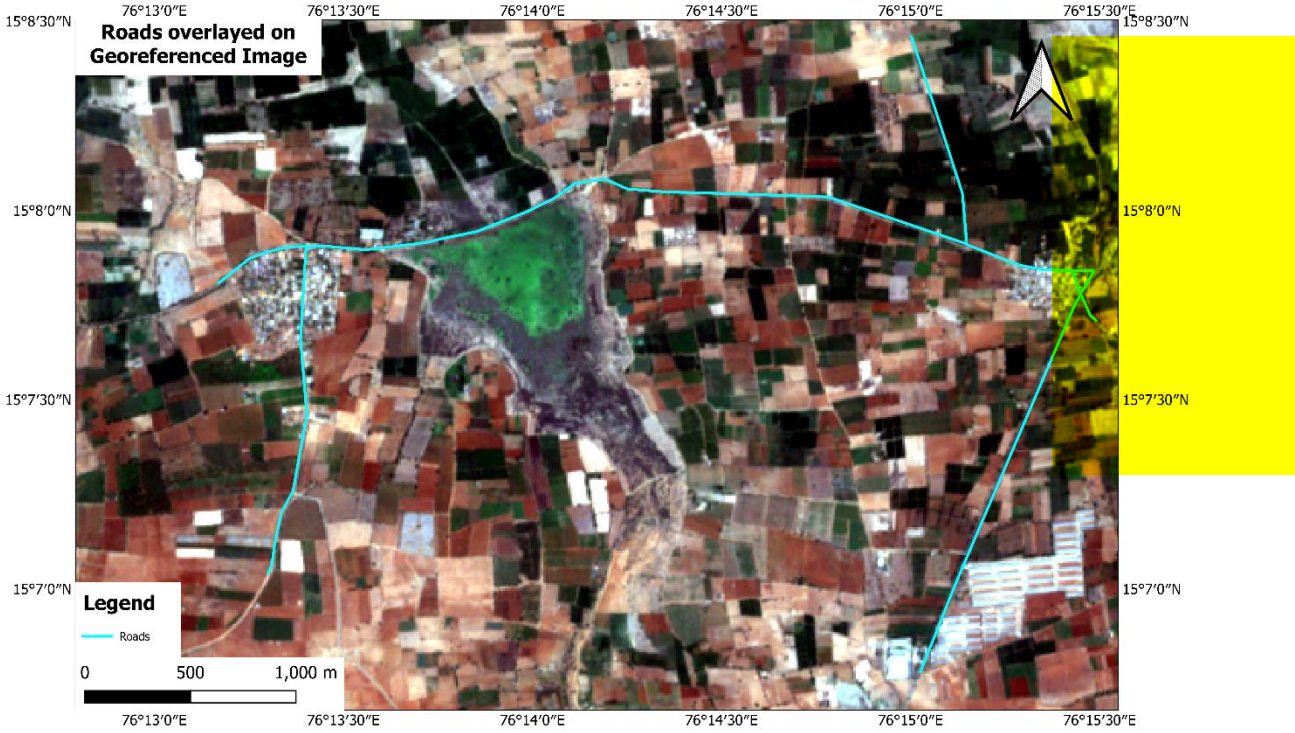
To check the accuracy of the digitized product, I downloaded an image from the Sentinel-EO Browser in TIFF format and high-quality March to avoid any cloudy parts.



Now, the georeferenced map is overlayed, and the transparency is reduced to visualize the accuracy.



The overlay affirms the accuracy of georeferencing, but it is very difficult to observe because of its clumsiness. A good way to visualize it is by overlaying the roads.



The road network in the original image coincides with the network of roads in the Downloaded Image, which assures the reliability of the georeferencing.