Document Submission:

ISRO Data: The LISS-III data is downloaded from the (open data archive) Bhuvan website of ISRO. The tile used for mapping is H43L16 (Long-Lat: 77.75E 30.0N - 78.0E 30.25N), Dehradun-Haridwar district.

Steps in QGIS: The software used is QGIS

1. The downloaded LISS-III of the year 2013 data is extracted from the D Drive slecting the 4 bands and map open in the layers panel.
2. Virtual Raster is build selecting the 4 bands in the input file and saving as (deh2013).Right click the file, selecting Properties, change the band as Red: Band 3, Green: Band 2, Blue: Band 1 in symbology. Select Mean Standard Deviation and apply. OK.
3. Select the band in the data set and in Band set, select Band Order by clicking SCP.
4. Create the Training Input as (deh13-spectra). Open the training input, creates the Supervised classification through ROI.
5. Save the Supervised Classification as (layer-deh13).
6. Do Classification for applying supervised classification in whole map by clicking SCP.
7. Repeat the same procedure for the year 2016.
8. For change detection between 2013 and 2016 select Raster calculator through Raster.
9. In Raster Calculator, Subtract layer 0f the year 2016 from 2013 in the formula expression.
10. Save the change detection as change detection-1. It will open the layers panel. Select Pseudocolour. Value with negative and increase digit appears in symbology.
11. Compare and Analysis
12. Create Layout.

Complexities: Creating many layers such as virtual raster, supervised classification, raster calculation of both the years and compare.

Applications: It helps in the change of vegetation over the period of 3 years. The change in area of forest and vegetation indicates climate change. In the hillside, natural or manmade disaster can be evaluated. Landslides can be determined on the basis of the data. Crop and Bare Soil indicate the fertility of the land. Based on the agriculture and vegetation, settlements/Build Area is determined.

Use of Map: This map might be used to detect climate change between 2013 and 2016. This change ensures the climate change, whilst, the individual map shows the landcover classification.