

# African Drone and Data Academy (ADDA)



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## Module Title: GIS and Data Analytics

Lab Title: **GIS Data Visualization – Best Practices**

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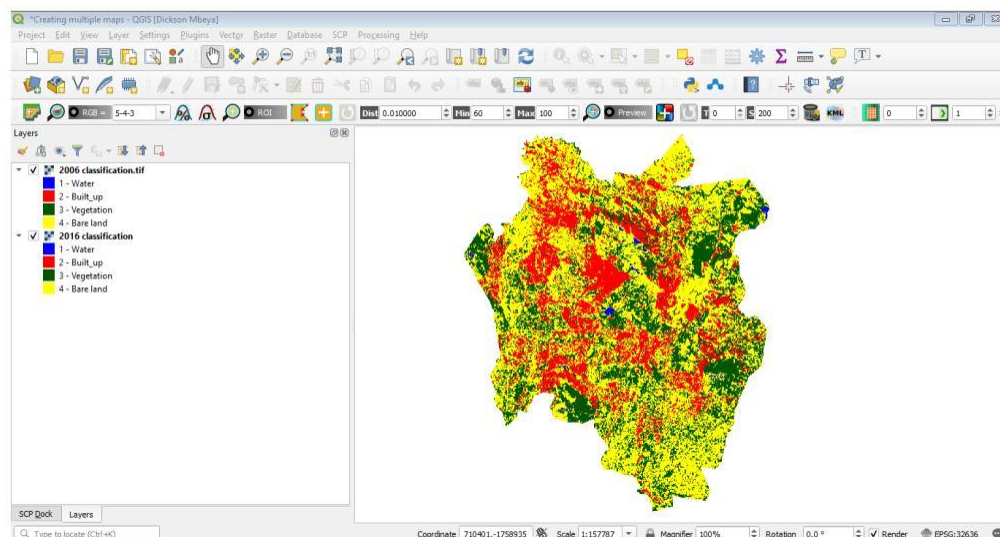
### Introduction

Creating side by side maps can be necessary in order to detect changes, make comparisons or study relationships. In this lab, you will create a side by side map for 2006 and 2016 land cover maps for Blantyre city.

**Aim:** To make quality side by side maps in QGIS

### Section one: Explore your data

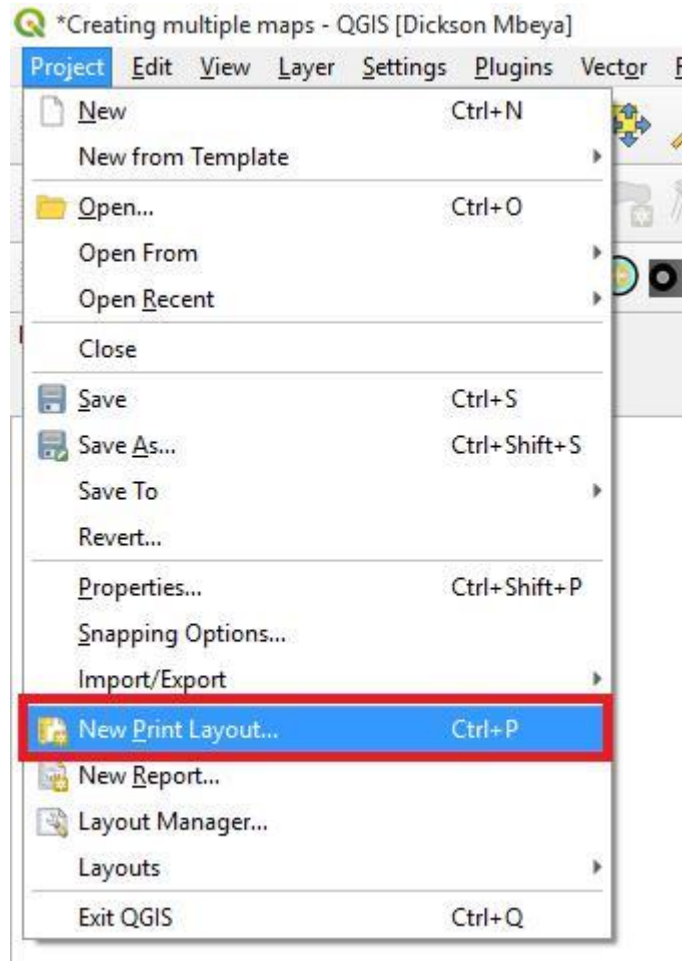
1. Open QGIS
2. Add to QGIS the **2006 classification** and **2016 classification** files which are located in the **Side by Side Map making** folder :



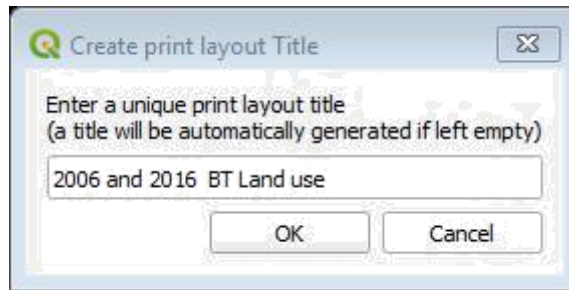
The 2006 classification and 2016 classification maps show land cover for 2006 and 2016 respectively. You will show the two land cover maps on the same map

## Section two: Layout manager

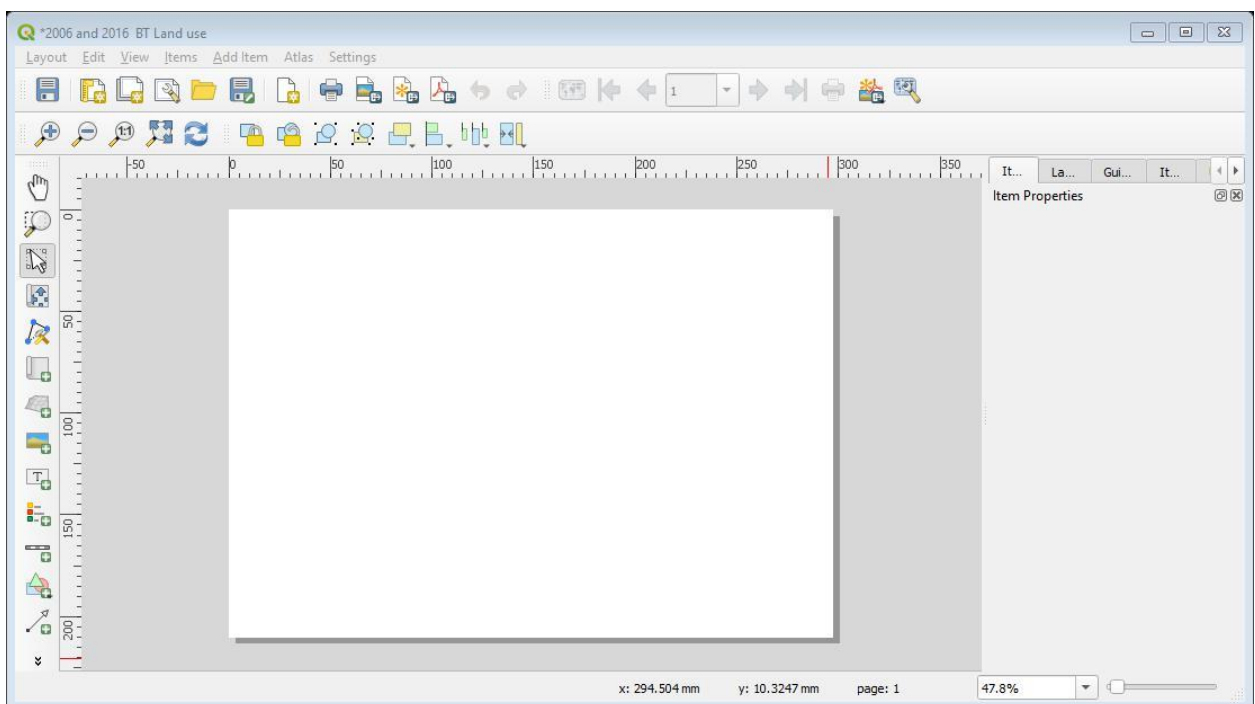
1. Click on **Project** in the menu bar and choose **New Print Layout...** to open the new print layout.



2. In the **Create print layout Title** dialog, type **2006 and 2016 BT land use**



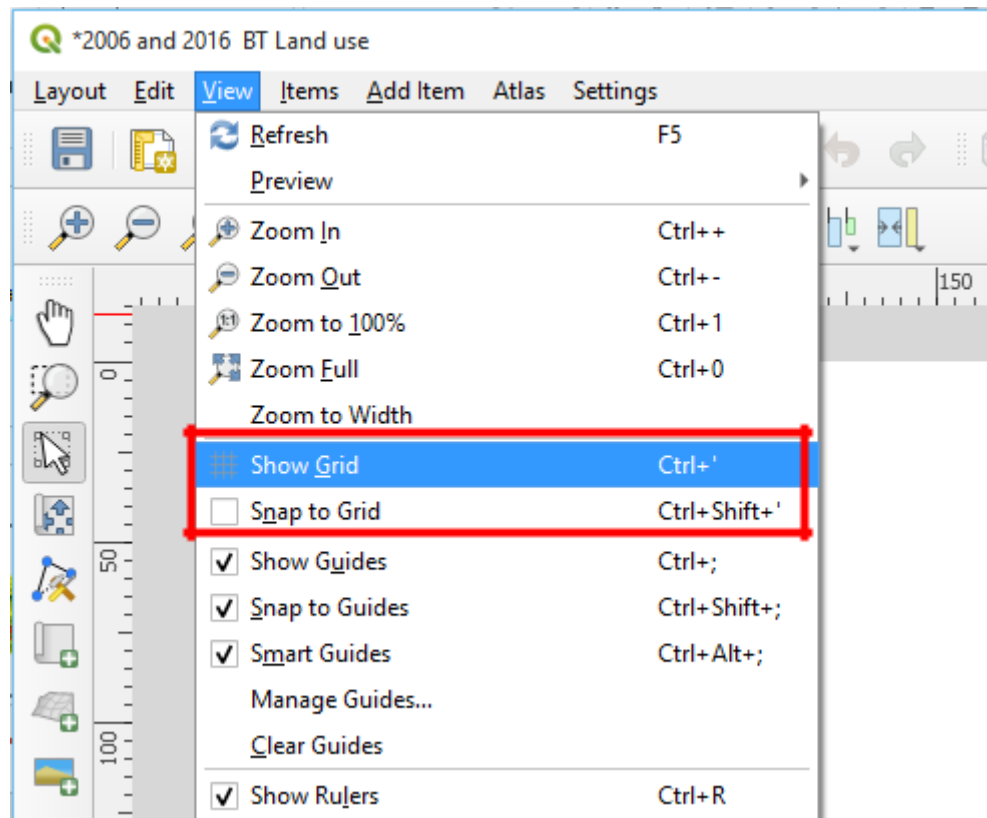
3. Click on **OK**
4. A blank print layout titled **2006 and 2016 BT Land use** will appear.



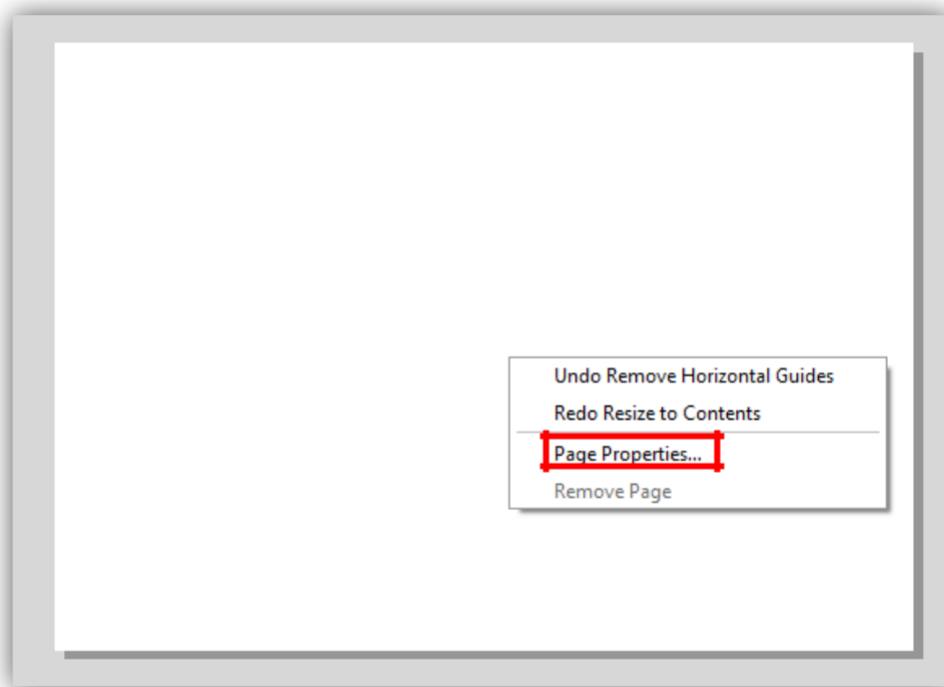
### Section three: Basic map composition

You will set the page layout, size orientation and quality

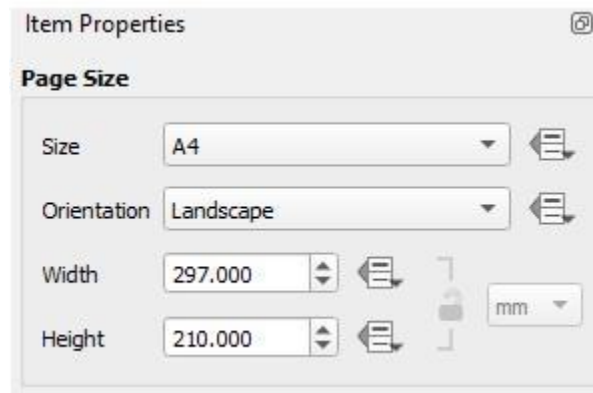
1. Click on View in the mane bar and enable Show grids and snap to grid. This is important so that you easily determine the map size to be occupied by one map.



2. Right-click inside the empty print layout window and click on **Page Properties...** in the pop-up.



3. In the **Item Properties**, set **Size** to **A4**, **Orientation** to **Landscape**.



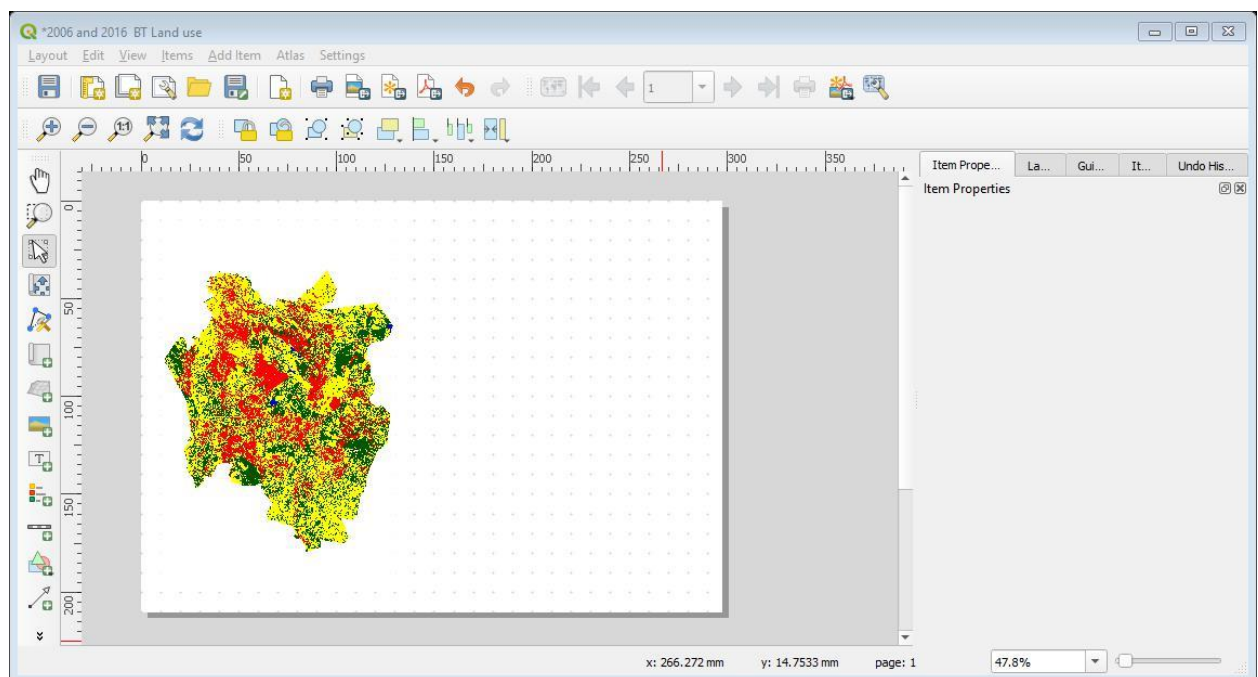
4. Switch off the **2016 Classification** layer in the project's layers panel

You will add the two maps to the print layout. Switch off the 2016 Classification layer in the Layers panel.

5. Click on the Add New Map button:



6. Left click and drag the mouse on the blank page. Determine the right size for each map in proportion to the page size. The map will appear on the page:



You can move the map by clicking and dragging it around. You can also resize it by clicking and moving the boxes in the corners

Make sure that you leave margins along the edges and a space along the top for the title

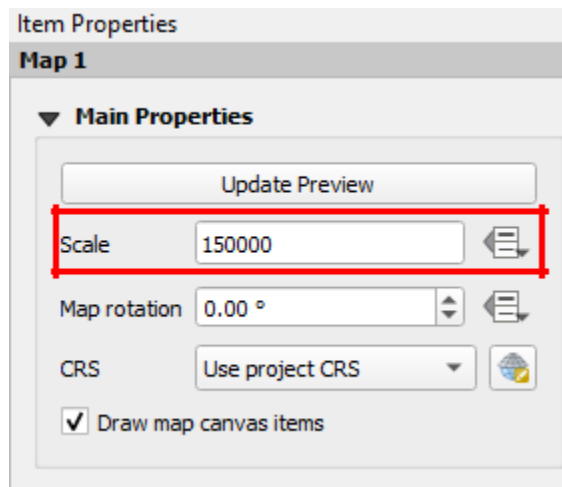
Zoom in and out on the page (but not on the map) by using these buttons:




You can pan the map using the Move item content tool: 

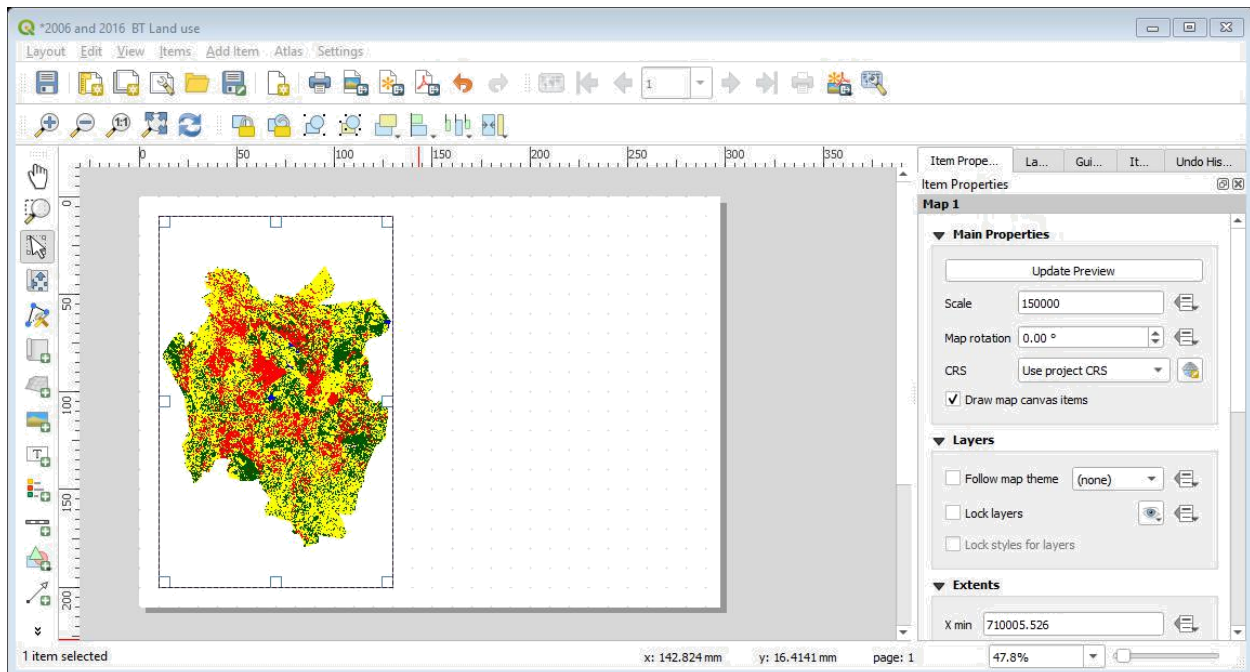
To refresh the map, use the Refresh view button:

7. Click inside the map to select the map frame
8. Then Click on item properties
9. In the **Main Properties** section, change the value of **Scale** to 150000:




If part of the map is not appearing within the map frame, drag the and move it using the

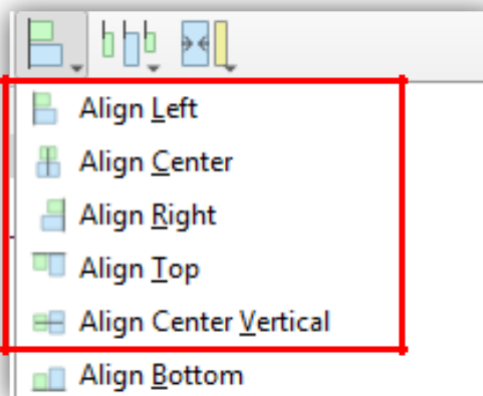
Move item content tool  so that the whole district boundary appears within the map frame:



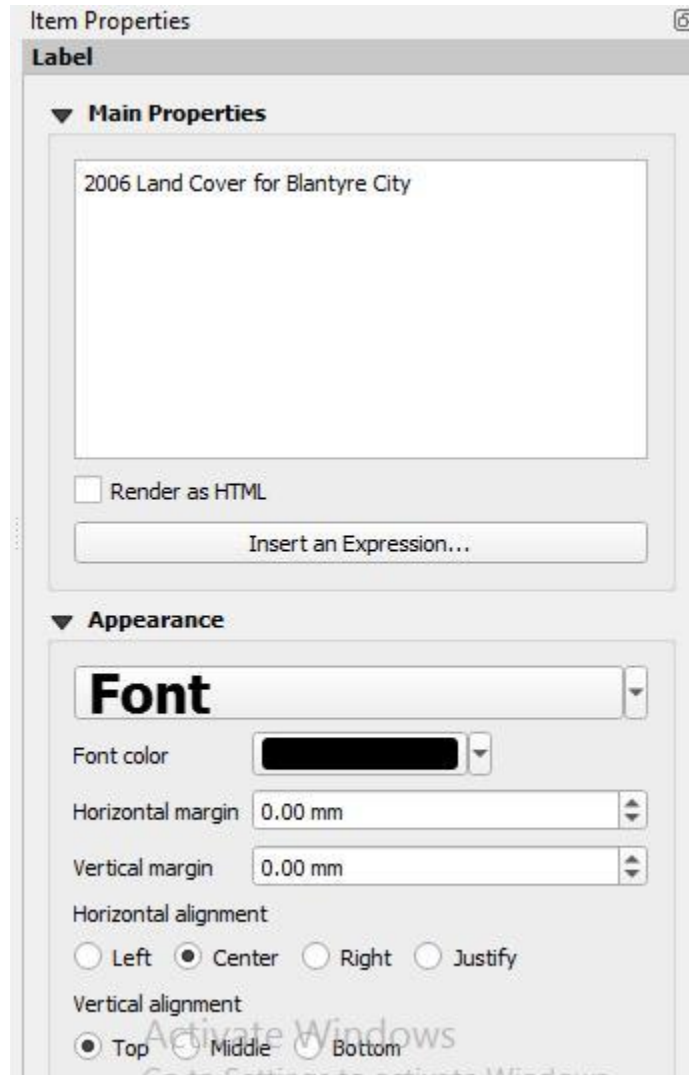
## Section four : Adding a title to the first map

You will add a title to your map plus other map elements to make it more meaningful and understandable by your readers.

1. Click on the Adds a new Label to the layout button: 
2. Left-click on the page, above the map and a label will appear at the top of the map.
3. Resize it and drag it and place it in the top center of the page. To position the title relative to the map you can also use these tools:

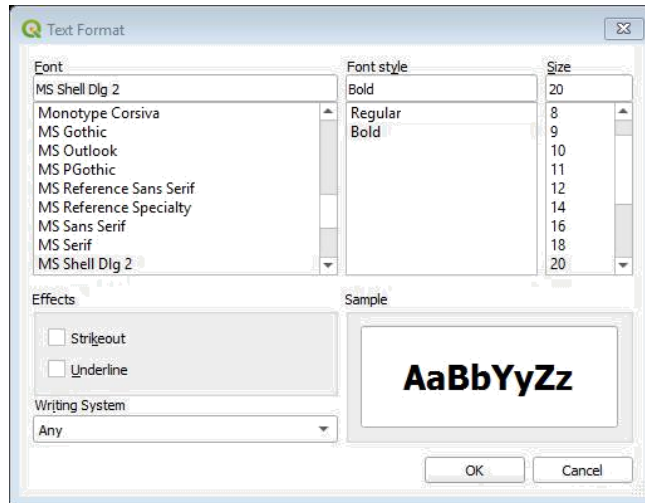


4. Select the label by clicking on it.
5. Click on the **Item Properties** tab in the side panel of the Layout window.
6. Change the text of the label to '2006 Land Cover for Blantyre City'.



7. Under **Appearance**, click on **Font** and change the **Font style** to **Bold** and **Size** to **20**:






8. Set **Horizontal alignment** to **Center**

## Section five: Adding the legend to the first map

You will add a legend to the map in order to help the map reader understand what various things on the map mean.

1. Click on this button: 

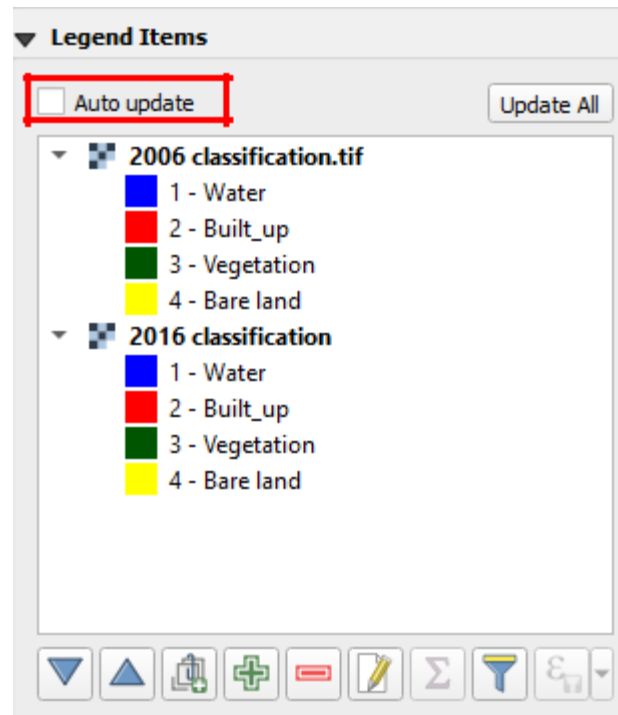
2. Left click and drag the mouse on the part of the page where to place the legend. You can edit the legend to properly name the legend items

You can rename the legend items when necessary.


3. Click on the legend to select it

4. In the **Item Properties**, you will find the **Legend items** panel

5. Uncheck the **Auto update** option:

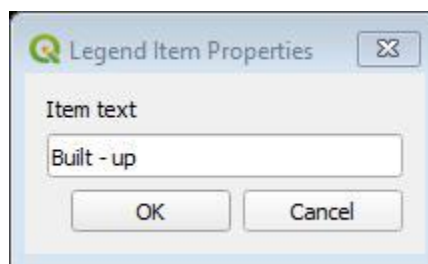


6. Select the **2016 classification** legend layer from the list

7. Click on the  button to remove the 2016 classification layer from the legend To edit the names of legend items:

8. Select the layer to be edited

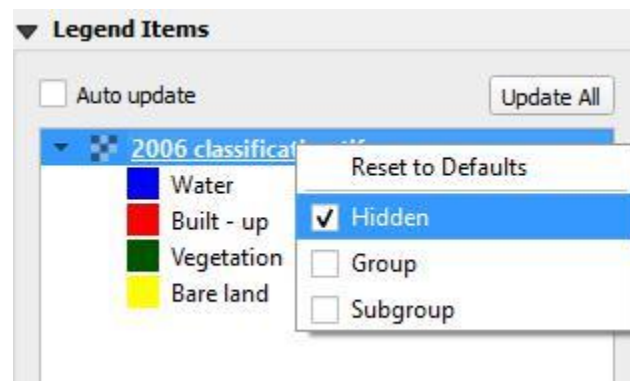
9. Click on the edit button: . The **Legend Item Properties** window will open:



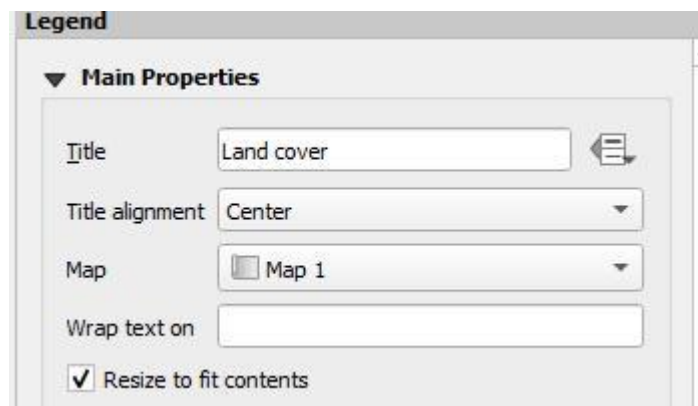
10. Rename the legend items according to their assigned colors follows:

- a. Water
- b. Built-up
- c. Vegetation
- d. Bare land

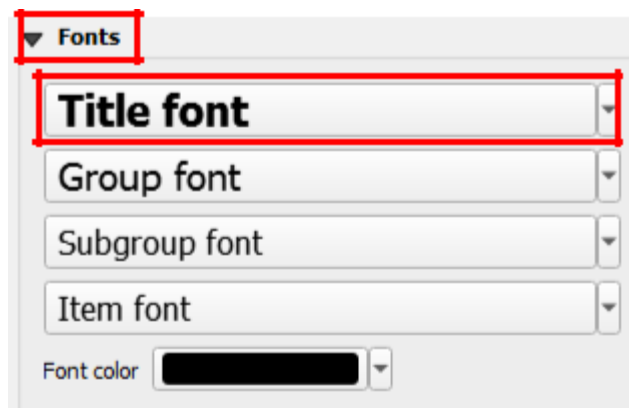
11. Right-click on the 2006 classification.tif and select Hidden



12. Under the **Main Properties** of the **Legend**, write **Land cover** as **Title** and change **Title alignment** to **Center**.




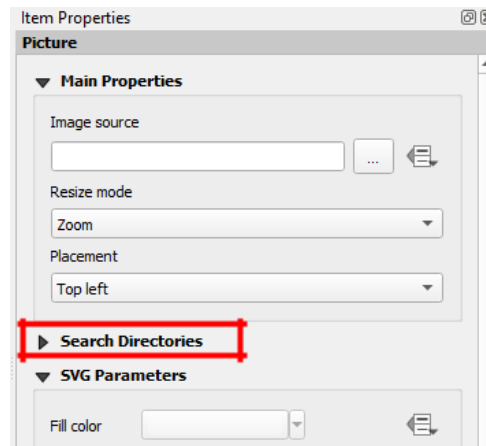
13. Scroll down the Item properties tab of the legend and click on **Fonts** and change the **Title font** to **Bold**



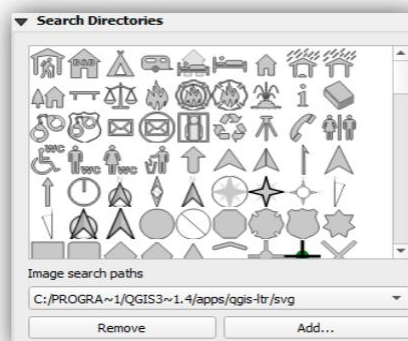
## Section six: Adding a north arrow to the first map

Now, you will add a North arrow to the map in order to indicate map orientation. The Print layout comes with a nice collection of map-related images including many types of North Arrows.

1. Click on this button: .
2. Click on the page, where you want to place a North arrow.
3. On the right-hand panel, click on **Item Properties** tab .
4. Click on **Search Directories**:




5. Wait for a few seconds to load. Once loading is complete, you will see a collection of pictures, among them are different types of north arrows:

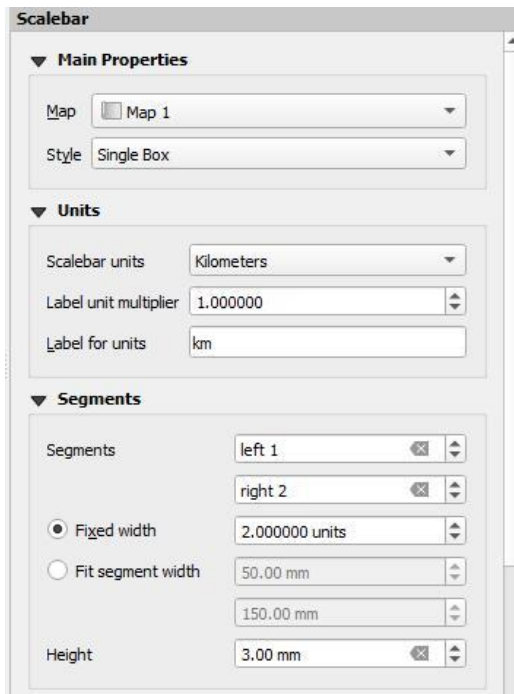


6. Click on a north arrow of your choice to add it to the map
7. Resize the north arrow so that it balances with other elements on the map

## Section seven: Adding a Scale bar to the first map

Your map readers would also want to know the scale at which features have been represented on the map. You will add a scale bar on the map

1. Click on this button: 
2. Then right-click and drag on the page where you want to place the scale bar on the map and change the **Main Properties**, **Units** and **Segments** as shown in the figure:



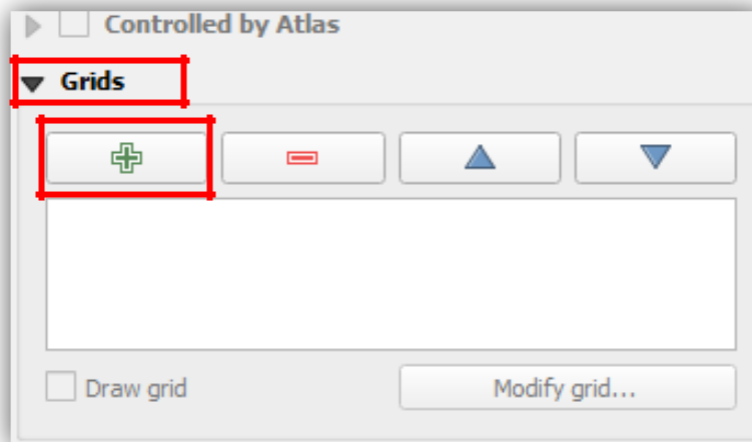
The image shows a 'Scalebar' properties dialog box with three main sections: Main Properties, Units, and Segments.

- Main Properties:**
  - Map: Map 1
  - Style: Single Box
- Units:**
  - Scalebar units: Kilometers
  - Label unit multiplier: 1.000000
  - Label for units: km
- Segments:**
  - Segments: left 1, right 2
  - Fixed width: 2.000000 units (selected)
  - Fit segment width: 50.00 mm
  - 150.00 mm
  - Height: 3.00 mm

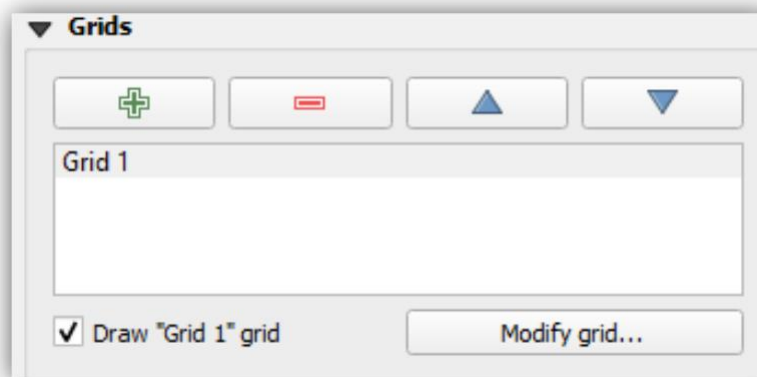
## Section eight: Adding a Grid to the first map

Your map users may also be interested in that the map should also show coordinate grid.

1. Click on the map to select it.
2. Then in the **Item Properties**, scroll down until you find **Grids** option. Click on the plus button:



3. Grids1 will appear in the Grid list panel



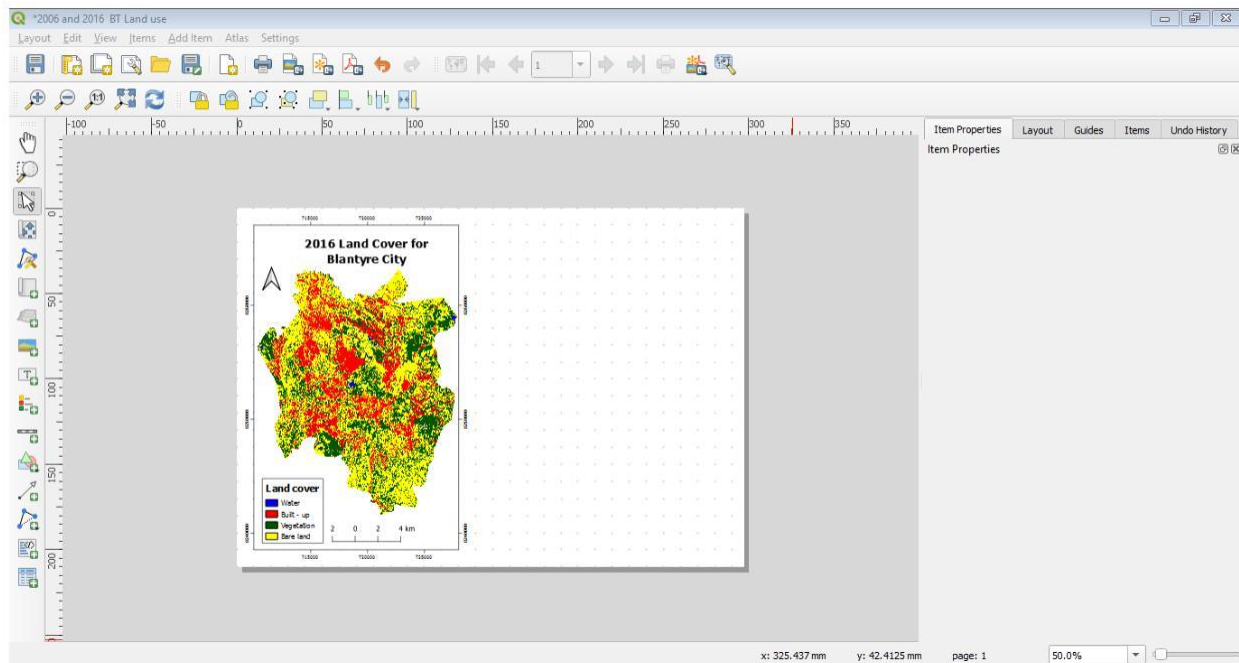
4. Click on **Modify grid...** so you can set how your grid should appear.

In the Map Grid properties:

5. Select **Frame and annotations only** as **Grid type**.
6. Set the interval for **X** to 5000 and **Y** to 10000.
7. Set **CRS** to **WGS 84/ UTM zone 36S (EPSG:32736)**
8. Scroll down to the **Frame** section and select **Exterior ticks** as **Frame style**.
9. Scroll down and make sure that **Draw coordinates** option is checked.
10. You will notice that by default, both the **X** and **Y** coordinates have been labelled horizontally. Change the way the **Y** coordinates (Left and Right coordinates are

drawn) by changing the **Horizontal** styles to **Vertical ascending** for right and left side of the grid frame.

11. Change the **Coordinate precision** value to '0'.
12. Click on the map to select it and check Frame to draw map frame
13. Your final first map (2006 classification) should now look like:

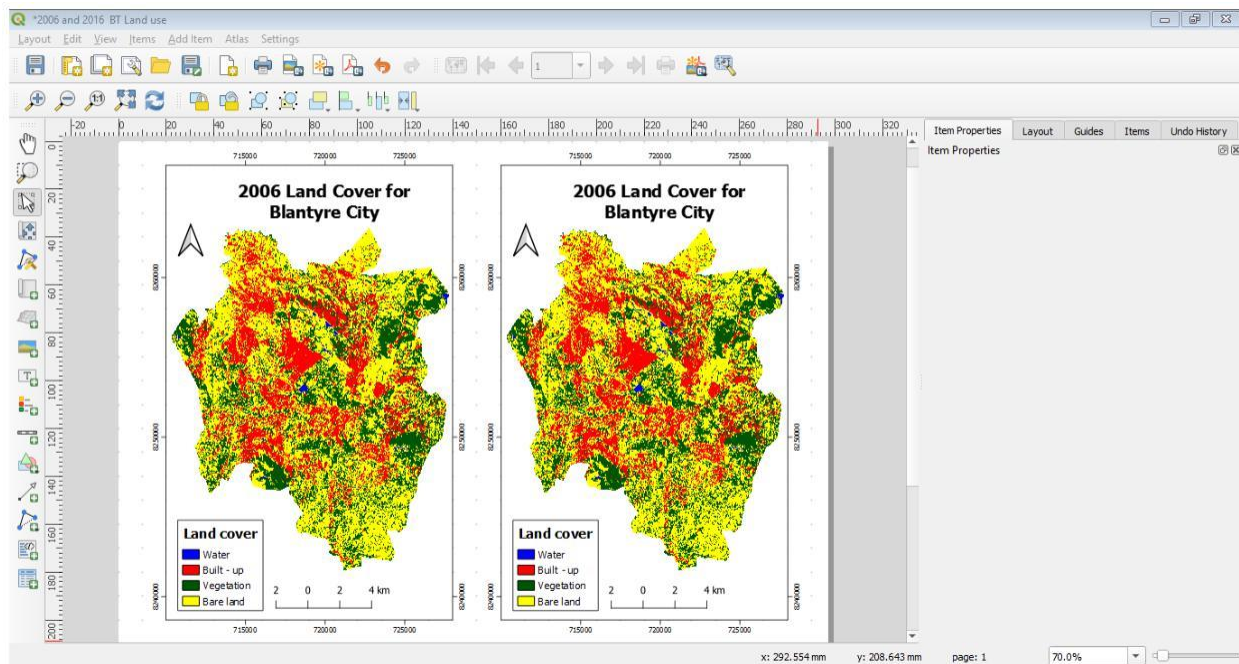


## Section nine: Adding the second map to the print layout

You will add the second map (2016 classification) to the same page. You will copy and paste the first map body, and all the map elements on the same page and to maintain the scale for the second map and avoid repeating the process of adding map elements to the second map. The other way to follow the same process of adding map elements to the map as demonstrated in the previous sections. This would be the case if the second map had a different theme.

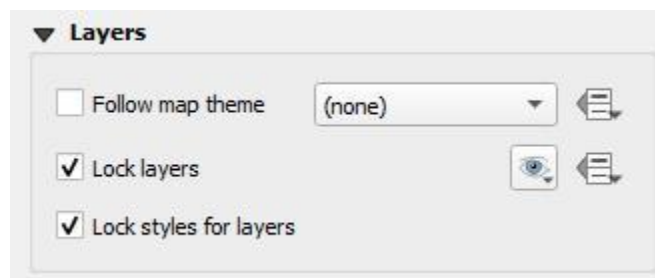
14. Hold **Ctrl+Shift** and select the first map body and its map elements
15. Press **Ctrl + C** to copy the selected items
16. Press **Ctrl + V** to paste the items (second map) on the page.

17. Drag the second map and all its elements to the right side of the page, positioning them as shown below:



In order to add the 2016 classification, you will lock layers of the first map and refresh.

18. Select the first map and scroll up in **Item properties** and check the box for **Lock layers** and **Lock styles for layers**.



19. In QGIS project **Layers** panel, enable the **2016 classification** layer and disable the **2006 classification** layer.

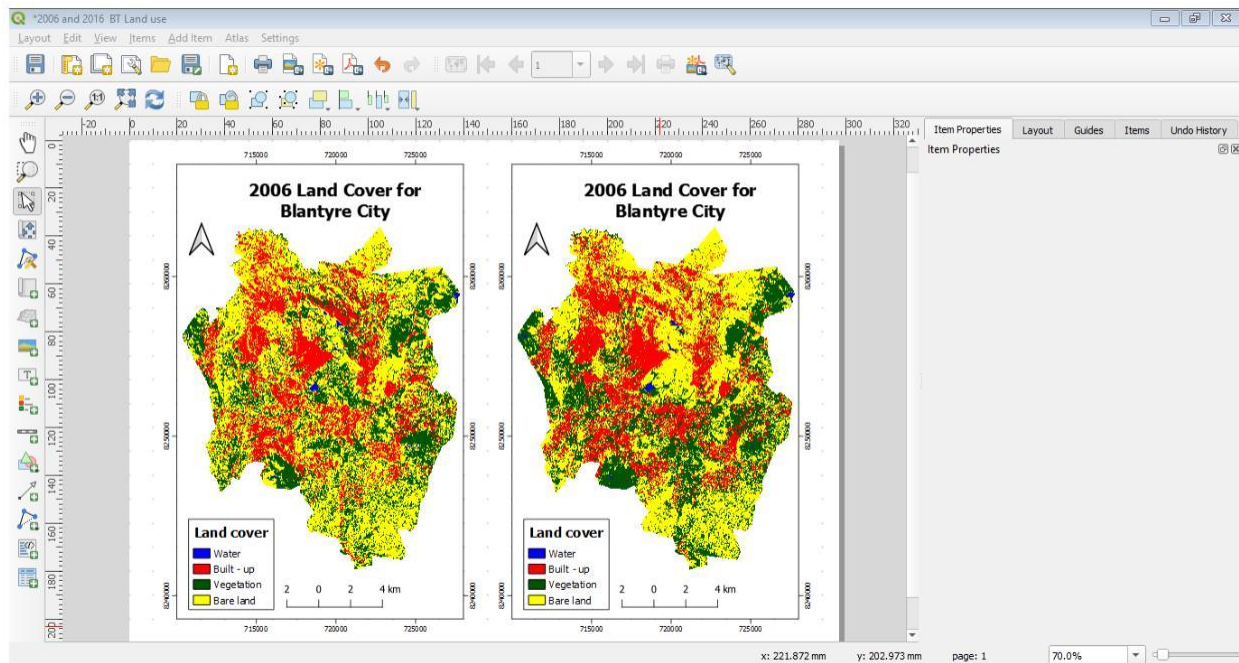
20. Go back to the print layout and select the second map

21. Click on the refresh tool :





The second map will be updated with the 2016 classification map:

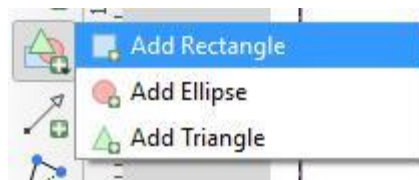


22. Edit the title of the second map to **2016 Land Cover for Blantyre City**

## Section ten: Adding a bounding box to both maps

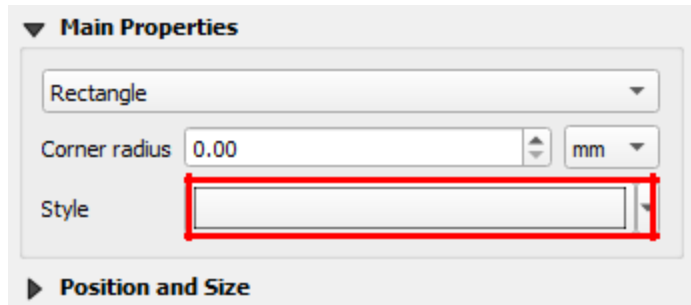
You can add a bounding box to the maps.

23. Click on the **Add Shape** tool  and select **Add Rectangle**:

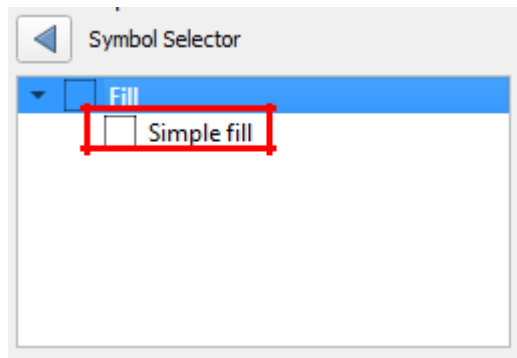


24. Right-click on the page and draw the rectangle to cover the both maps on the page.

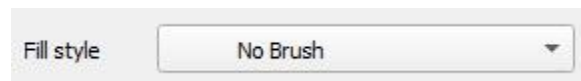
25. Under the Shape Main properties in the right panel, double-click on Style.



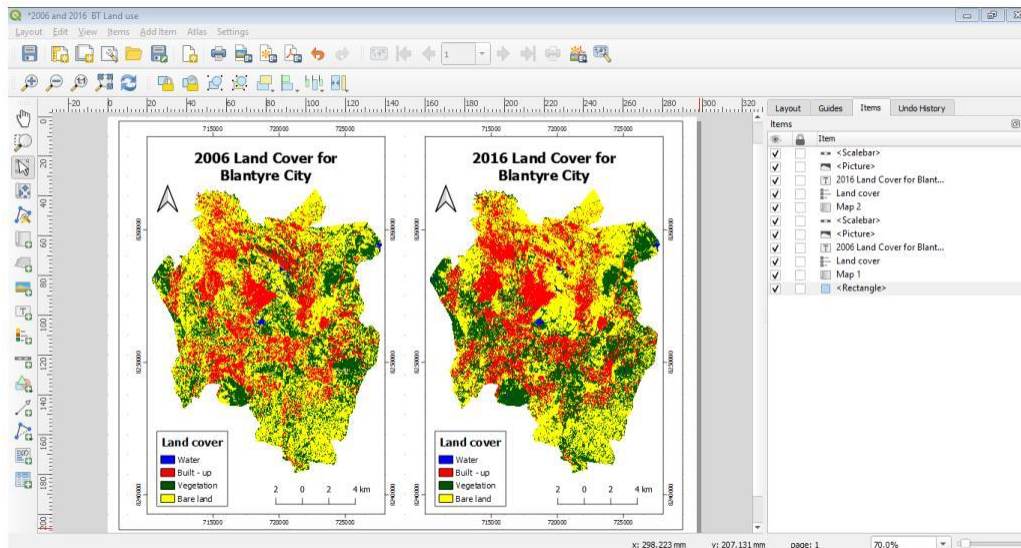
26. Under symbol selector, click on **Simple fill**:



27. Change the **Fill style** to **No Brush**:





Your final maps should look like this:



## Section Nine: Exporting your Map

Your map is now ready for export. QGIS allows you to export your map as an image, PDF or SVG. Choice of the output format depends on the map making purpose and the intended map user. It is also possible to directly print the map from the **Print layout**. The following buttons are used in exporting the map:

-  Export as image
-  Export as SVG
-  Export as PDF

You will export the final map as an image and a pdf.

1. Click on the Export as image button: 
2. Save the output as ***your name*\_2006 and 2016 BT city land cover maps** in the Map making folder
3. Repeat steps 1 and 2 but selecting export as PDF in step 1.

Upload your products to the **Day 4 products** folder in this course's Google drive.

## Section Ten: Conclusion

In this lab you have learnt how to use QGIS Print layout to create quality side-by-side maps. You can further work out on your map in order to come up with more than one layout formats. You can then choose the best layout. Map making is both a science and an art. Perfection comes with practice!

**Submit this Assignment on the link in Moodle!**

