Practical 3

Creating your map layouts using the print composer in QGIS
Aim of practical

This third and final practical aims to familiarize the trainees with the Print Composer, the tool that QGIS includes to create map layouts. We will be creating thematic maps with the outcomes of the Practical 2.

Key learning skills

In this practical you will:

- Create a new map composition with the Print Composer
- Learn basic features in a map composition
- Manage several map compositions with the Composer Manager
- Export map layouts to different image formats
Practical 3

1. Creating Thematic Map Layouts

Suppose that the government wishes to track the progress of the LF programme in reporting and managing morbidity cases at the district level and you have been asked to produce a map to inform this process. The three steps to create a map are:

1. Get the data displayed in QGIS exactly as required in the map
2. Create the actual map to be exported / printed
3. Export or print the map

Choose a disease outcome you are interested in. We will produce a document with a map showing aggregated data (choropleth), for instance lymphedema prevalence (by 100,000 inhabitants) at district level. Finally, we will create a map composition which also includes the prevalence of hydrocele by district.

1.1. Introduction to Print Composer

In order to share our data, we must produce maps and export to other formats for printing. After you have arranged your layers to create a good map layout in your viewer, you will use the Print Composer tool in QGIS to format your maps and include multiple elements in a single layout.

Opening the Print Composer provides you with a blank canvas to which you can add the current QGIS map canvas, legend, scale bar, images, basic shapes, arrows and text.

Legend, scale bar and title are features which should always be included in a map composition. The compass arrow can be omitted as the QGIS map canvas is always oriented with the north at the top.

- Open the map project we created in the Practical 2 by selecting it from list of recent projects. This list of projects appears when you open QGIS 2.18.9. This new option is only available from the latest QGIS 2.18.9 versions.

- Open Print Composer by selecting File>New Print Composer in the drop-down menus or select the button corresponding to New Print Composer in the tool bar.
Note: Composer Manager button allows us to access to the different composition in progress and manage them; showing, removing, closing and so on.

- When prompted give the new map composition the title name of Cameroon LF morbidity. Click on the Add new map button and click-and-drag a rectangle over the blank workspace to add your current map view to the Print Composer.
• Resize the map element by clicking on the **Select/Move item** button, selecting the element, and dragging in either the corners or the sides and adjusting the frame size. With the map selected, you can now adapt more properties in the map **Item** tab.

• In order to adjust the map view to the canvas extent, under the **Item properties** tab, click on the **Set to map canvas extent** button.
• To move layers within the map element select the map element, click the Move item content and move the layers within the map element frame with the left mouse button.

• If you want to zoom in/out to/from a certain area of the country, hold down the “Ctrl” key in your keyboard while scrolling up or down with the mouse wheel.

• To add a frame around the map view, make sure that the Frame option is ticked on under Item properties tab. To lock the element position within the print composer canvas, select the lock option underneath the Item tab. You can also go to the Item Properties tab and enable the option Lock layers for map item. This will fix this map layer.
Adding a Scale Bar

- Add a scale bar to the map using the Add new scale bar tool and dragging a box on the map. If we have enabled the option on-the-fly projection and set a Projected Coordinate System (EPGS: 3395-WGS84/World Mercator) (see Supplemental File), your scale bar will be displayed in kilometres (metric units) as this corresponds to the map units. Otherwise, your scale bar will be set in degree units.
You can adjust the style and numbering under the **Item Properties** tab while the scale bar is highlighted. Open the **Item properties** tab at the right of the PRINT COMPOSER window in order to adjust the different parameters available for this feature. Notice that this tab is shared by any feature added to our map composition.

You will need to ensure that the scale bar is linked with “Map 0”. This can be done using the Scalebar’s **Main properties** options.

According to the spatial resolution at which the map has been displayed, check that some key parameters are setting as follow:

**Units**
- Scale bar unit: meters
- Label bar multiplier: 1000
- Label for units: km

**Segments**
- Left: 1
- Right: 4
- Fixed width: 75000 units

Place the scale bar just below the map view by selecting the feature, dragging, and dropping it below the map view.
• You can alternatively adjust front, size, appearance of the scale bar and other parameters through the options available at the **Item properties** tab.

**Adding a Legend**

• Add a legend to the map by selecting the **Add new legend** tool and click to any place on the layout.

• Use the options under the **Item properties** tab to adjust the legend to your liking.
• Under **Main properties** option, change the legend title and write *District Prevalence of Lymphedema*. Afterwards, click on **Title Font** button under **Fonts** panel and change the title format; underline, bold and letter size 12, for example.
• To change the format of some legend items click on the **Legend item** panel, and select the **Filter legend by Map Content** tool to update the legend and display only those layers enabled.

• To change the legend items’ names select an item within the legend and click on **Editing** tool. First, you MUST disable the option **Auto update** to enable you to make changes on your legend items. For instance, you can write *Prevalence (per 100,000 inhabitants)* instead of *CMR_LF_morbidity_prevalence*, and *No data available* instead of *CMR_adm2*. 
**Adding Title and North Arrow**

- Add a title to the map using the **Add new label** tool.

- Adjust the text under the item tab, and size and position by dragging the blue squares on the map. When adding a new label, the **Item Properties** tab pops up enabling you to change title content and font properties.
- Under **Main properties** panel, change the map title and write *District prevalence of Lymphedema in Cameroon (2015)* (by default it should be titled ‘QGIS’). Click on **Font** button under **Main properties** panel and change the title format; underline, bold and letter size 16. Finally, under **Alignment** panel check the **Center** and **Middle** option in both Horizontal and Vertical alignment settings respectively.

![Image 1](image1.jpg)

- To add a North Arrow to the map, use the **Add image** tool. Click on the map to place a box, and choose a north arrow from the images on the right, under **Search directories** panel.

![Image 2](image2.jpg)
1.2. **Print Layouts: exporting your maps**

- The **Composition** tab allows you to set paper size, orientation, the print quality for the output file in dpi (resolution) and to activate snapping to a grid of a defined resolution.
- You can also activate the **Print as raster** checkbox. This means all elements will be rastered before printing or saving as Postscript of PDF.

To export the map composition as an image or PDF document:
• Under Composer in the main menu, select Export as PDF or Export as Image. In the window, set the name of the file, select the file type - JPEG, TIFF, GIF, BMP - and click on Save.

• Clicking on Save button will bring up a new dialog box where will be prompted to make changes at the image resolution. Click OK accepting the setting given by default.
1.3. Multiple maps in one view

You can add multiple map views or legends or scale bars in the Print Composer canvas. Each element has its own properties and in the case of the map, its own extent. Delete or the backspace key will remove an element from the composer canvas.

- Resize the map view by dragging in either corner and adjusting the frame size to make enough room in the canvas to include a new map view. To do that, you will have to unlock the map display (‘Map 0’).
• Unlock the other map features (i.e. legend, north arrow and scale bar) and place the legend and scale bar underneath the map to allow room to include a new map.

Go to the Item Properties tab and enable the option Lock layers for map item and Lock layers style for map item. This will fix this map layer.
• Once you are happy with the new location of your map items, lock ‘Map 0’ again to prevent undesirable changes on this map. Lock the legend and scale bar too as they are features linked to this map.

• You can now return to your active QGIS map viewer and change the layers to produce a different map based on the prevalence of Hydrocele by district. Change the outcome to be displayed under the Style tab in LAYER PROPERTIES. Right click on the CMR_LF_District_prevalence.shp and change the layer style setting the parameters detailed below:

  ✓ Graduated symbol
  ✓ Field: PrevHYC
  ✓ Colour ramp: YlOrRd
  ✓ Mode: Natural Breaks (Jenks)
  ✓ Classes: 4
• Return to your Print Composer window and follow the steps aforementioned to add a new map view to your current layout.

• Add a new map frame to display the new map information. Try to fit it within the available area at the right side of the ‘Map 0’. You can also add additional legend and scale bar for this new map.

Finally, modify the map title according to the new map composition.
• Save as Image the new map composition. Under File in the main menu, select Export as PDF or Export as Image. In the window, set the name of the file and select the type to be saved, JPEG, TIFF, GIF, BMP, etc., when exporting the map as image, and click on Save.