



Getting started with QGIS

Tutorial ID: IGET_GIS_001



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Getting started with QGIS

Objective

This tutorial will cover following objectives

- To download Quantum GIS (QGIS)
- Installing Quantum GIS
- Getting familiar with QGIS interface
- Installing a plugin
- Adding Vector and Raster data layers to QGIS map Canvas

Software: Quantum GIS

Level: Beginner

Time required: 4 Hour

Prerequisites and Geospatial Skills

1. Basic knowledge about computer.
2. Internet Connection

Reading

1. Sutton, T., Dassau, O., & Sutton, M. (2009). [A gentle introduction to GIS](#). *Chief Directorate: Spatial Planning & Information, Eastern Cape*.

Tutorial Data: Tutorial data can be downloaded from [IGET_GIS_001](#)

Introduction

Quantum GIS is a free and open source GIS application. It was a result of SourceForge project, QGIS is developed using C++ and Qt toolkit. Initially QGIS developed for displaying the GIS data, now it evolved as full GIS software package. It is published under GNU Free Documentation License as an official project of Open Source Geospatial Foundation (OSGeo). It is compatible with all the operating systems and can very well handle multiple raster, vector and databases functionalities. QGIS is also serves as a window for assessing numerous other Open source GIS packages such as SAGA, GRASS, Post GIS, map server and also statistical package like 'R' etc. It also has very easy and convenient access to various tools and plugins. It is overall a very rich open source Geospatial tool.

Exercise 1: Downloading QGIS

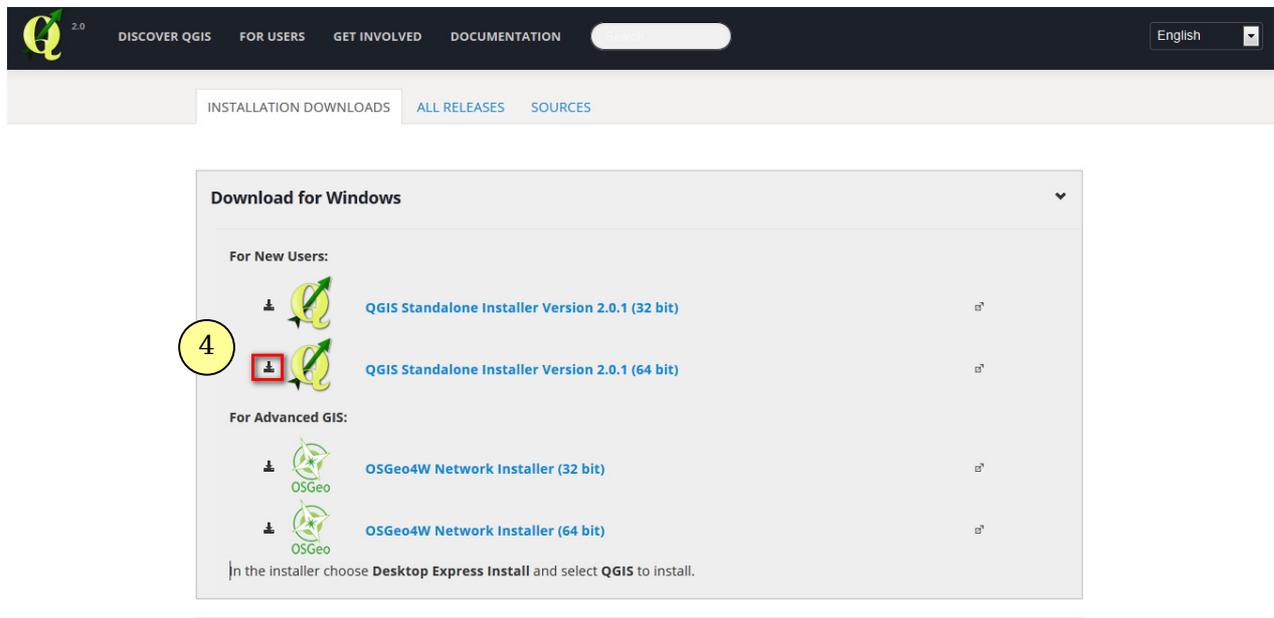
As mentioned earlier, it is free software and can be downloaded from the internet. We will see how to download QGIS (Windows compatible version) in this section. The only basic requirement for downloading QGIS on your system is availability of Internet connection. If you already have QGIS installation file then skip this section and directly proceed to the *Exercise No. 2*. If not, the procedure for downloading is as follows:

1. If you want to download the installation file, open the webpage of QGIS, i.e., "<http://www.qgis.org/>" in any of your internet browser like, Internet Explorer or Mozilla Firefox.
2. The following website will open up in your browser. Click on "**Download Now**" button.

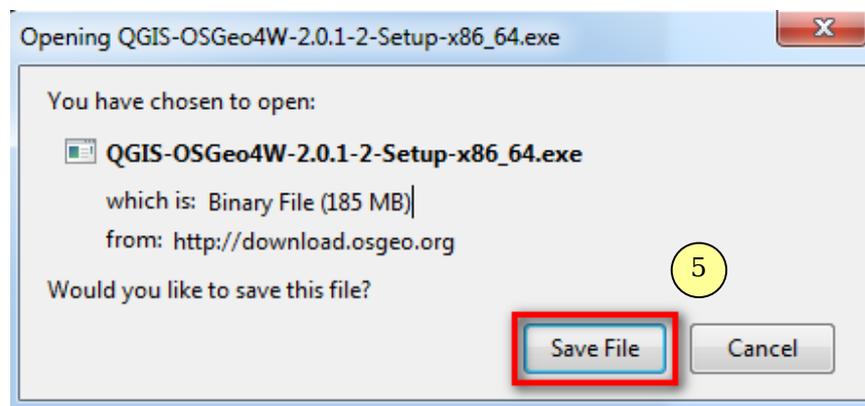


3. You will be redirected to new page. Depending on your operating system you have to select an appropriate set. Here we will consider windows as our operating system.
4. Depending on your computer architecture i.e., 32bit/64bit, select the appropriate version of QGIS for download. Just click on the  button in front of appropriate version to start the download.

Note: You can check for this by My Computer → Right click → Properties → System type.



5. A pop up window as shown below will appear. Click on '**Save File**' → Save the file in an appropriate location on local hard drive → '**OK**'.

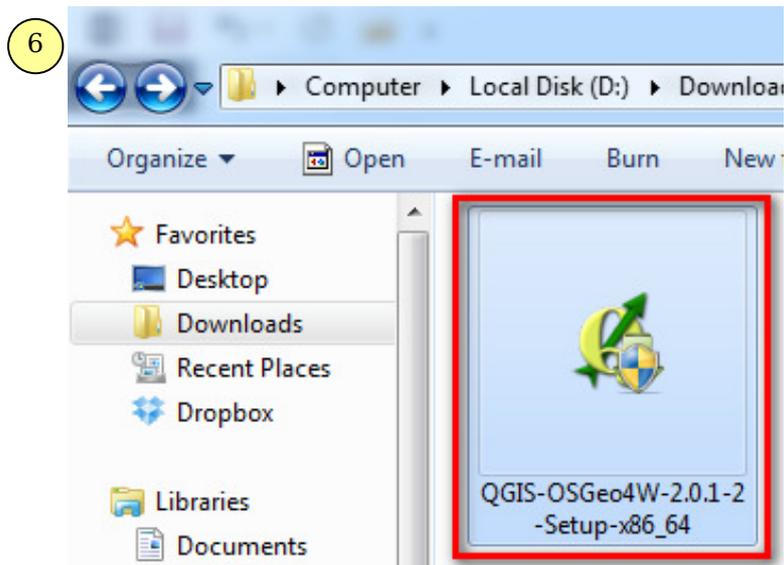


6. The file will be saved in your local drive, once it finishes the download. Next step is, running the setup. We will see this in next exercise.

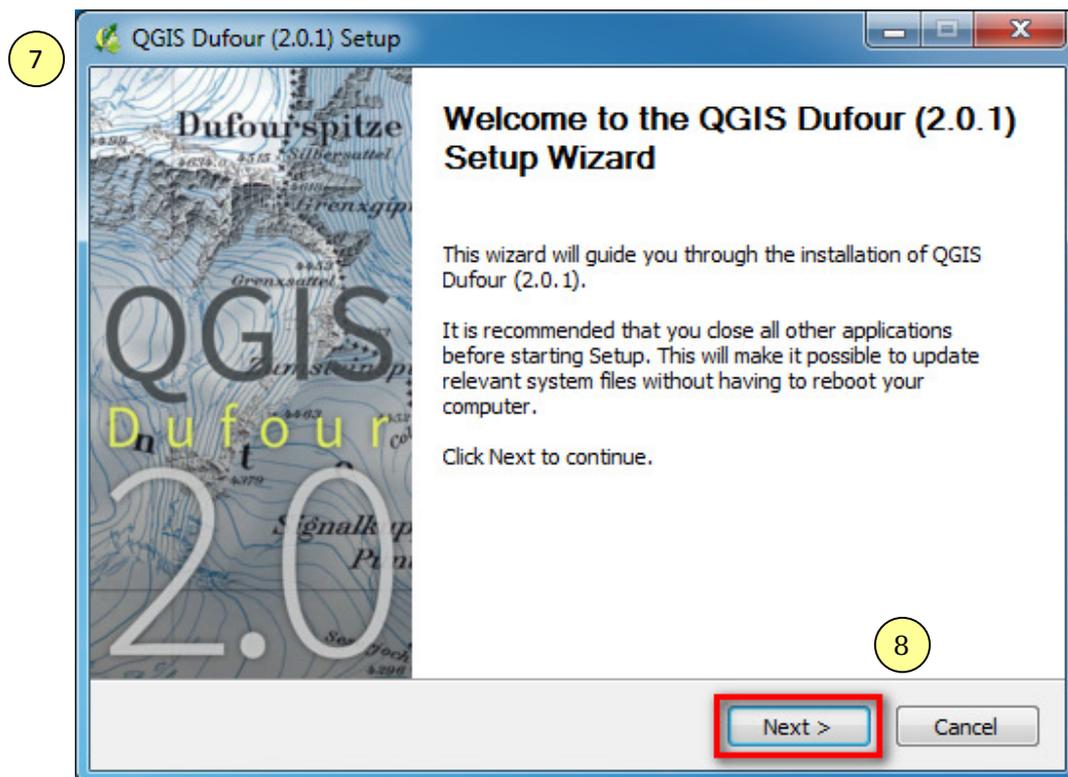
Exercise 2: Installing QGIS

Once you have the setup file on your local drive next step is to run this setup to install QGIS on your system.

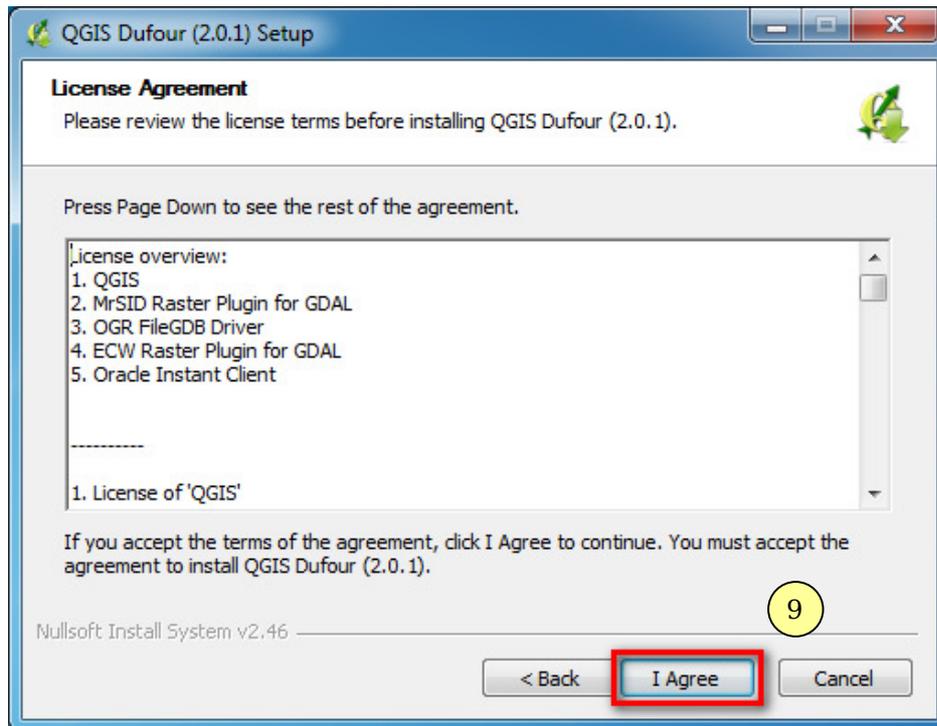
7. Navigate to downloaded setup file of QGIS. And double click on the icon. If you prompted by '*User Account Control*' popup window, click on '**Yes**'.



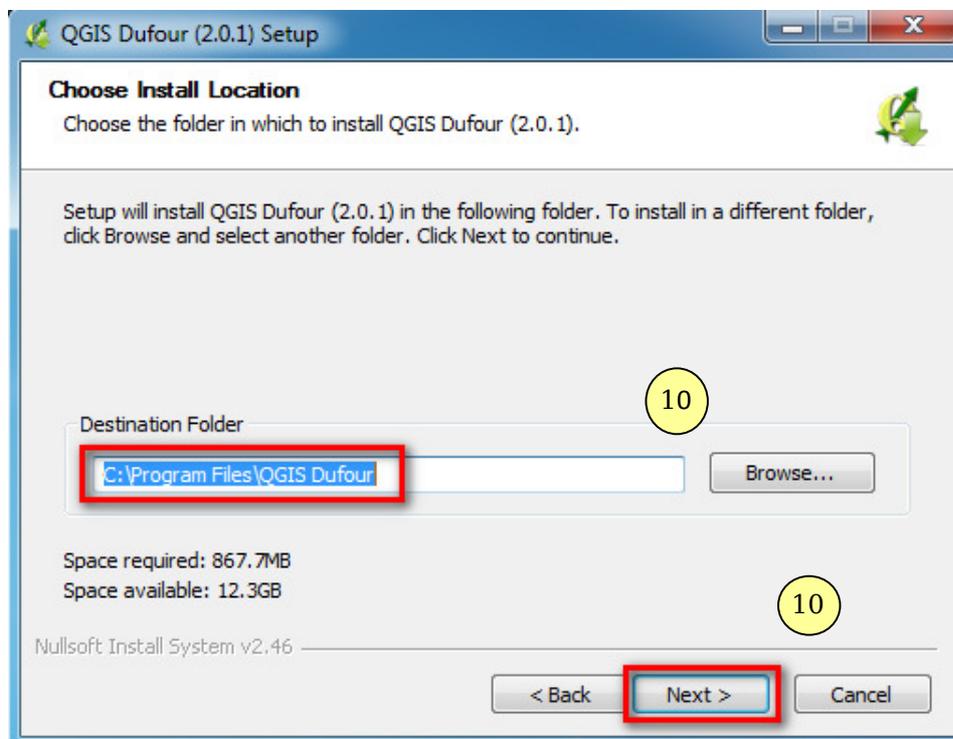
8. The setup window will open. Click on '**Next>**'



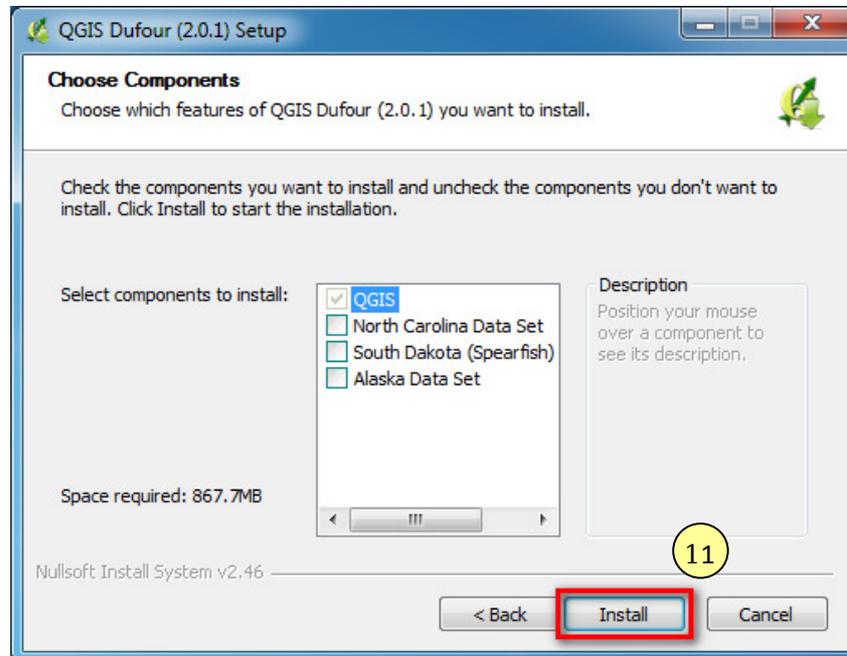
9. In the next window you will be presented with '*License Agreement*' read it and then, click on '**I Agree**'.



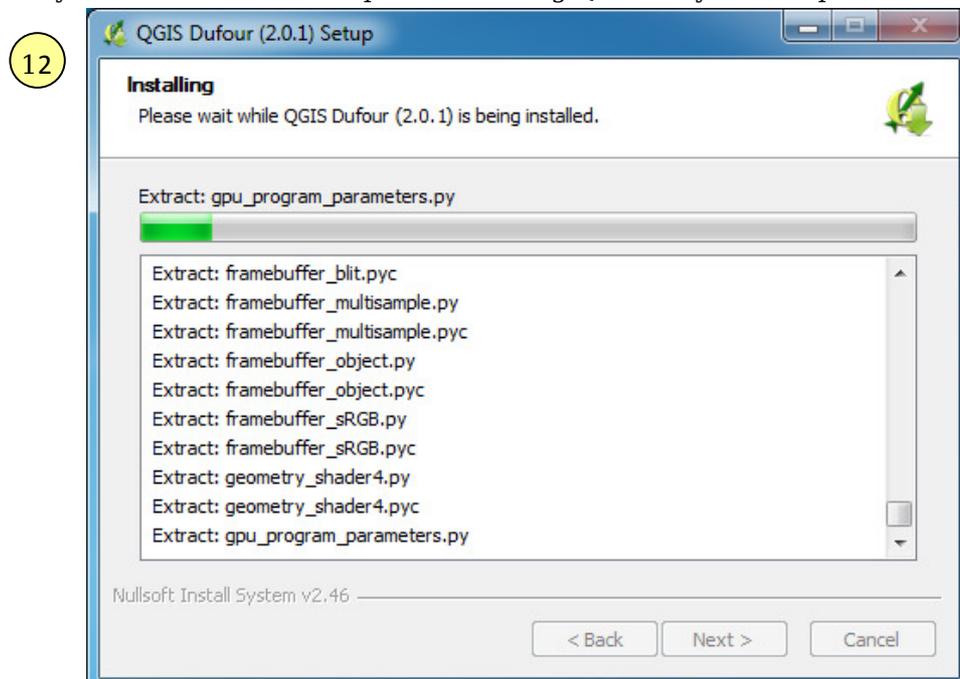
10. Now you have to choose the installation location, you recommended to keep the default path and click on '**Next**'



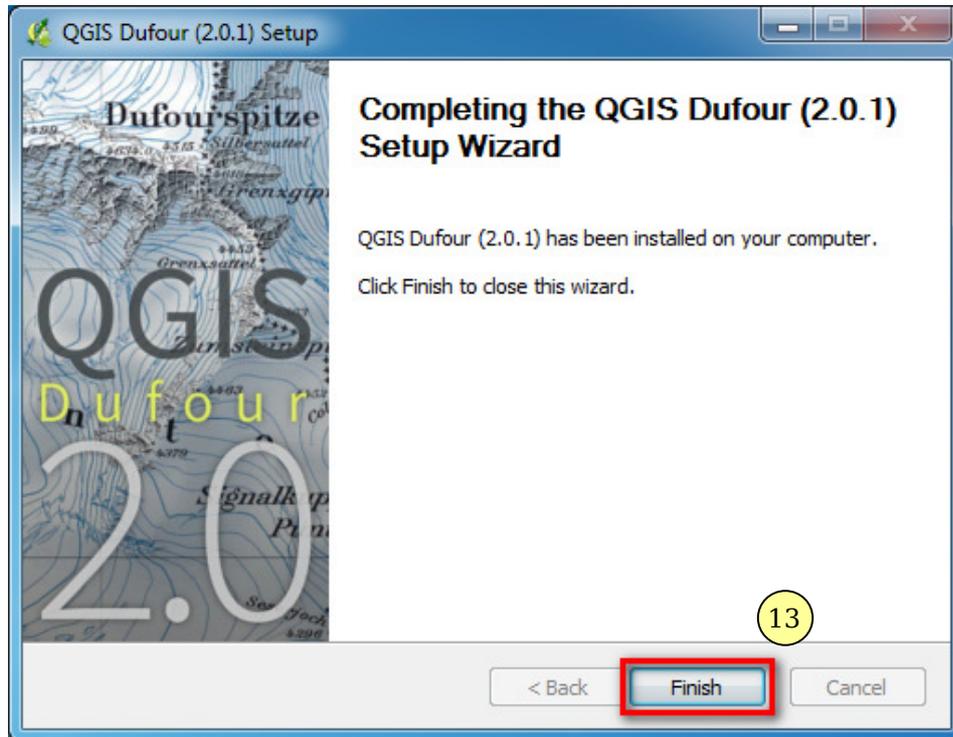
11. In the next window, you are prompted to choose the different components of QGIS and datasets, if you are interested you can check the component you want to install or leave as default. Click on **'Install'** to proceed to the setup.



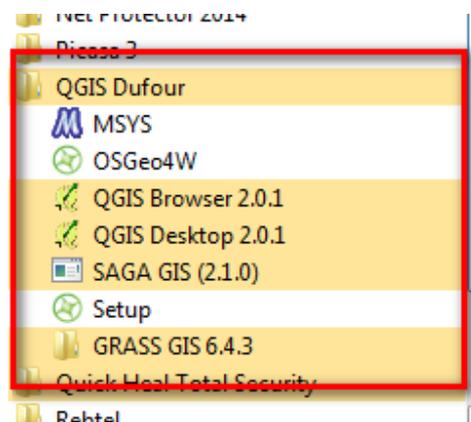
12. Now you can notice the setup will installing QGIS on your computer.



13. Once the entire installation process is over, you will be prompted to close the setup click on **'Finish'** to close.

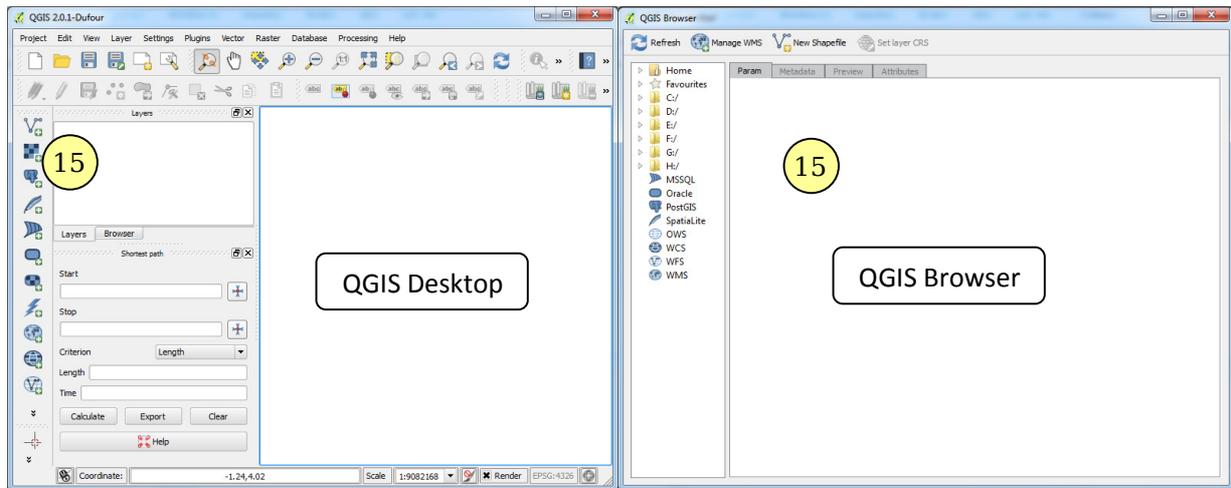


14. Now QGIS is ready to use. Navigate to 'Start → All Programs → QGIS Dufour → QGIS Desktop 2.0.1', to start QGIS Desktop.



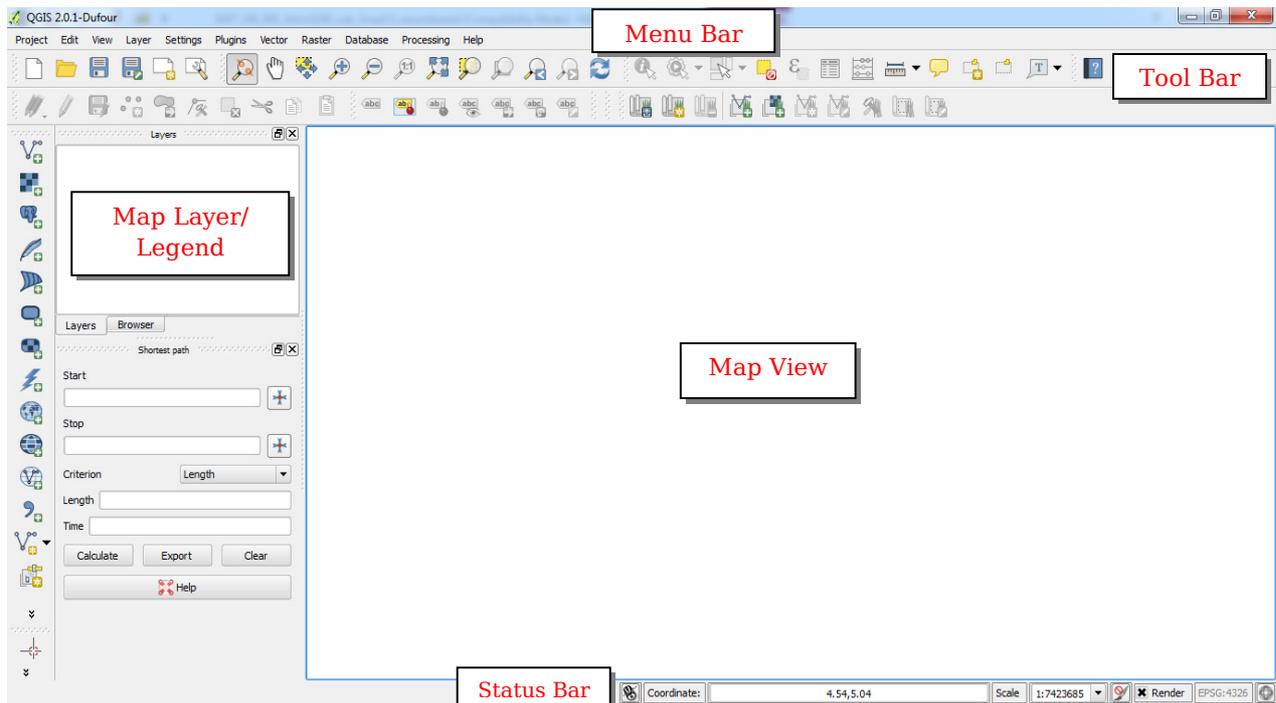
Note: QGIS 2.0.1 a standalone application and a new panel called **Quantum GIS Browser** along with the **Desktop** same as QGIS 1.8.0. Browser help to navigate through the datasets and also allows you to preview the data while desktop help in creating, visualization and analysis of data.

15. Both the interfaces are shown below.



Exercise 3: QGIS Graphic User Interface

In this exercise we will look into the details of QGIS graphic user interface. This exercise will make you familiarize with QGIS user interface. As we have already started up with the QGIS desktop. We will now see different component in it.

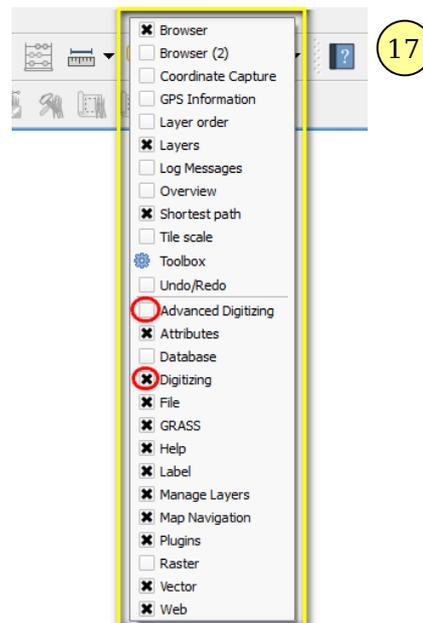


As seen in the above figure the interface is divided into five main components, they are further divided into more sub-components which facilitate easy access to the tools. Now we will go through each component in detail.

16. **Menu Bar:** It contains numerous pull down menus to administrate the project files. It Provides access to various QGIS features.
- a. Using **Project** menu we can *open, save* and *create* new quantum GIS projects. We can also make attractive map compositions using *Composer Manager*.
 - b. **Edit** menu contains editing tools mostly corresponding to vector layers and these functions are enabled only when layers are toggled, in other words when we enabled the editing mode.
 - c. **View** menu contains tools to map navigation, selecting features, identifying features, Measurement tools, contains tools to manage bookmarks, toolbars and panels.
 - d. **Layer** menu contains various tools to load layers like Vector layer, Raster layer, PostGIS layer, spatiaLite layer etc. It also facilitates to create new shapefile layer. You can query the attribute data using *Query* feature. Convert layer from one vector layer format to another using *save as* feature. You can view layer properties and also possible to do labeling using *Labeling* feature and many other tools we can discuss about them later.
 - e. **Settings** menu contains tools to set and manage custom CRS, keyboard shortcuts, style manager, customization and snapping options.
 - f. **Plugins** menu actually makes QGIS more powerful. Plugins are small software components which add a specific ability to the QGIS application. Various core and third party plug-ins can be accessed and managed by using this toolbar. We also have '*Python Console*' from where we can execute python code.
 - g. **Vector** menu contains various Research, Analysis, Geoprocessing, Geometry and Data management tools using which you can do extensive geospatial analyses on vector data sets. You can also download Open Street Map data here.
 - h. **Raster** menu contains various tools such as Georeferencer, Interpolation, tools for Terrain analysis, Zonal statistics, defining projection, Analysis tools and very important Raster calculator to perform raster operations.
 - i. **Database** menu contains database manger which is a non official part of QGIS core, you can drag and drop contents from QGIS browser into the DBmanager. It can execute SQL queries against spatial database. You can directly import shapefiles to PostgreSQL using *spit*.
 - j. **Processing** menu is an added up menu in this version of QGIS. It has a very useful Tool box (facilitates to use various Digital Image processing tools) and *Graphical builder*.

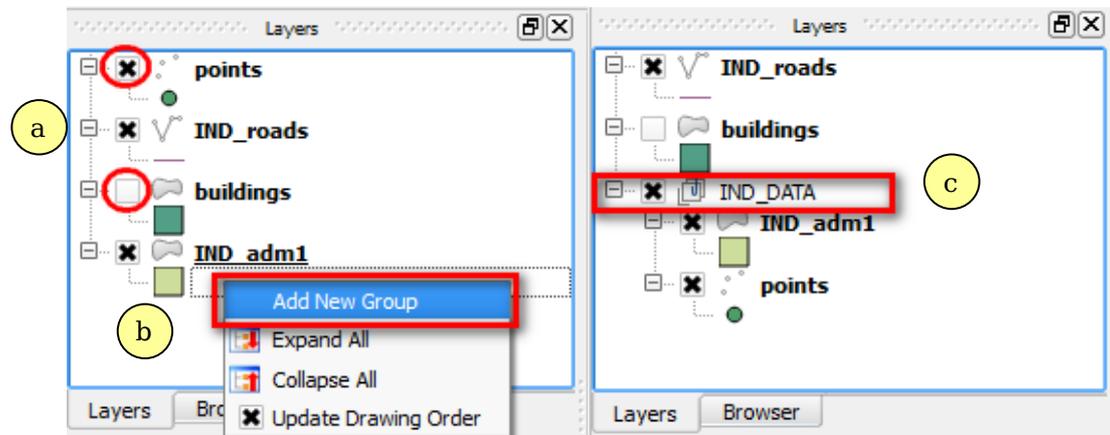
k. **Help** menu helps to access various help sections of all the functionalities available in the QGIS.

17. **Tool Bar:** Provides easy access to all the tools discussed above and with some additional tools for easy interaction with the map canvas. Each tool in toolbar is associated with a pop up information. Hold the mouse pointer on any of the tool for a while then you will notice a short description in a small pop up window. Toolbars can be moved and dropped wherever you wish. We can also enable/disable toolbars by right-clicking on the toolbar menu. Checking and un-checking the check box in front of the tool name will enable and disable that toolbar respectively.



18. **Map Layers/ Legend** component is useful to set visibility of the layers and Z-ordering. Z-ordering means the layers listed on the top of the layer are drawn over the layers which are listed below. It is always recommended to place Point layers on Line layers and Line layers on Polygon layers.

- a. The check box in-front of layer name is used to draw and draw off the layer. It is possible to rearrange the layer order by just dragging and placing it wherever required.
- b. It is also possible to group the different layers. Just right click in Layer bar and click on 'Add New group'.
- c. You can rename the group by (*right click over the group* → *Rename*) and add the required layer in that group by using simple drag and drop method.



- d. You can enable the context menu by right clicking on any of the layers. Context menu varies for different type of layers like, it may be different for raster and different for WMS layer. You can use various functionalities available in context menu for analysis of the desired layer.

19. **Map View:** It is very important component in QGIS. This section dedicated for displaying of vector or raster data. It is also referred as map canvas. Any function/tool that you perform through *Menu bar*, *Tool bar*, or in *Legend*, the result of the tool will be reflected in map view/canvas.

20. **Status Bar:** It displays the current **coordinates**, where the mouse pointer is pointed in map canvas. It also shows the **scale** of the map and map **rendering** option to enable or disable map rendering.



- a. Using '**CRS status**'  tool in status bar, you can set required coordinate reference system for the project (Just for visualization).
- b. '**Toggle extent and mouse pointing**'  tool button is used to see the extent of current zoom of the canvas layer.

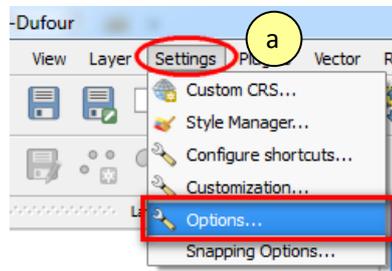


Exercise 4: Installing QGIS Plugins

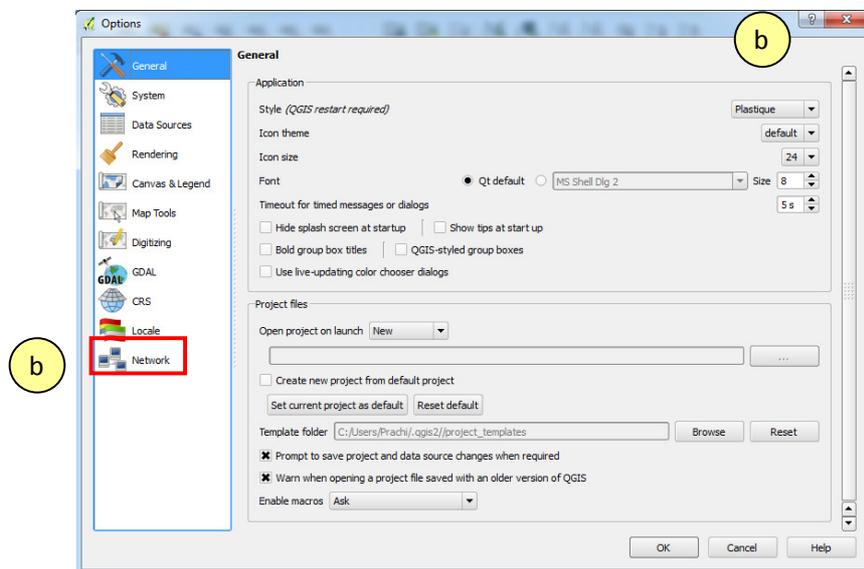
As we have discussed earlier, plugins have made QGIS more efficient. This can be easily downloaded using '**Plugins**' menu bar. The only requisite for downloading plugin is an internet connection. Before going to downloading plugins we will learn how to do proxy settings that may be required for some of the network connections. For example if you are using your college Wi-Fi or Airport Wi-Fi connections. If there is are no proxy settings for your network connection then you can directly proceed with the download procedure.

21. Proxy setting

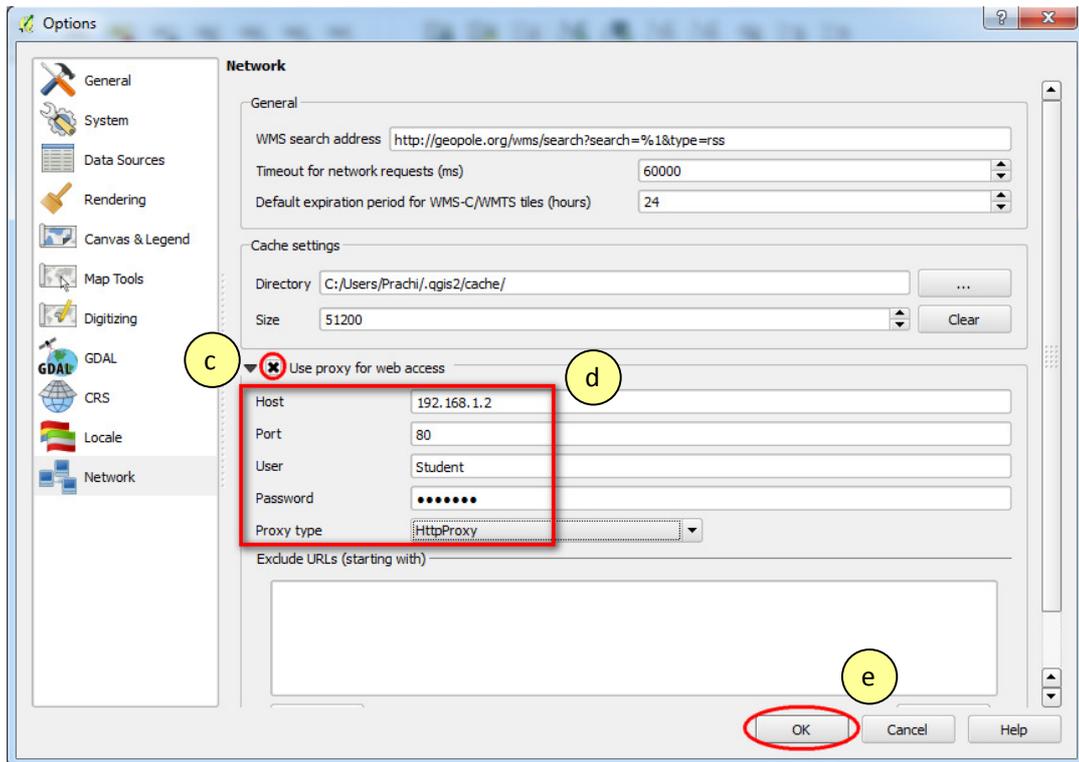
- a. Go to 'Settings' in menu bar and click on 'Options'.



- b. Then 'Option' window will open up. Navigate using arrow keys at top right corner of the window to 'Network' tab. Click on 'Network' and the network setting window will open up



- c. Click on the check box in front of 'Use proxy for web access.' So that the fields which are needed to be filled will be enabled.
- d. Provide proper details of host and port, and also username and password if exists in the respective fields. (This information can be provided by your Network administrator). Keep the proxy type as *HttpProxy*.



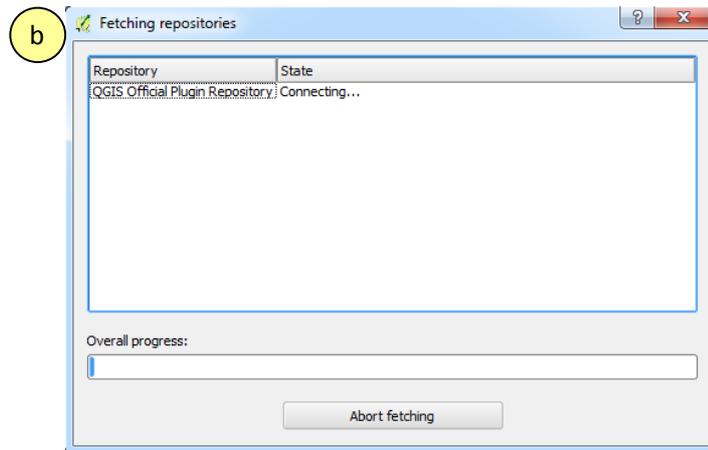
- e. Click '**OK**' to save proxy setting.

22. Downloading Plugins:

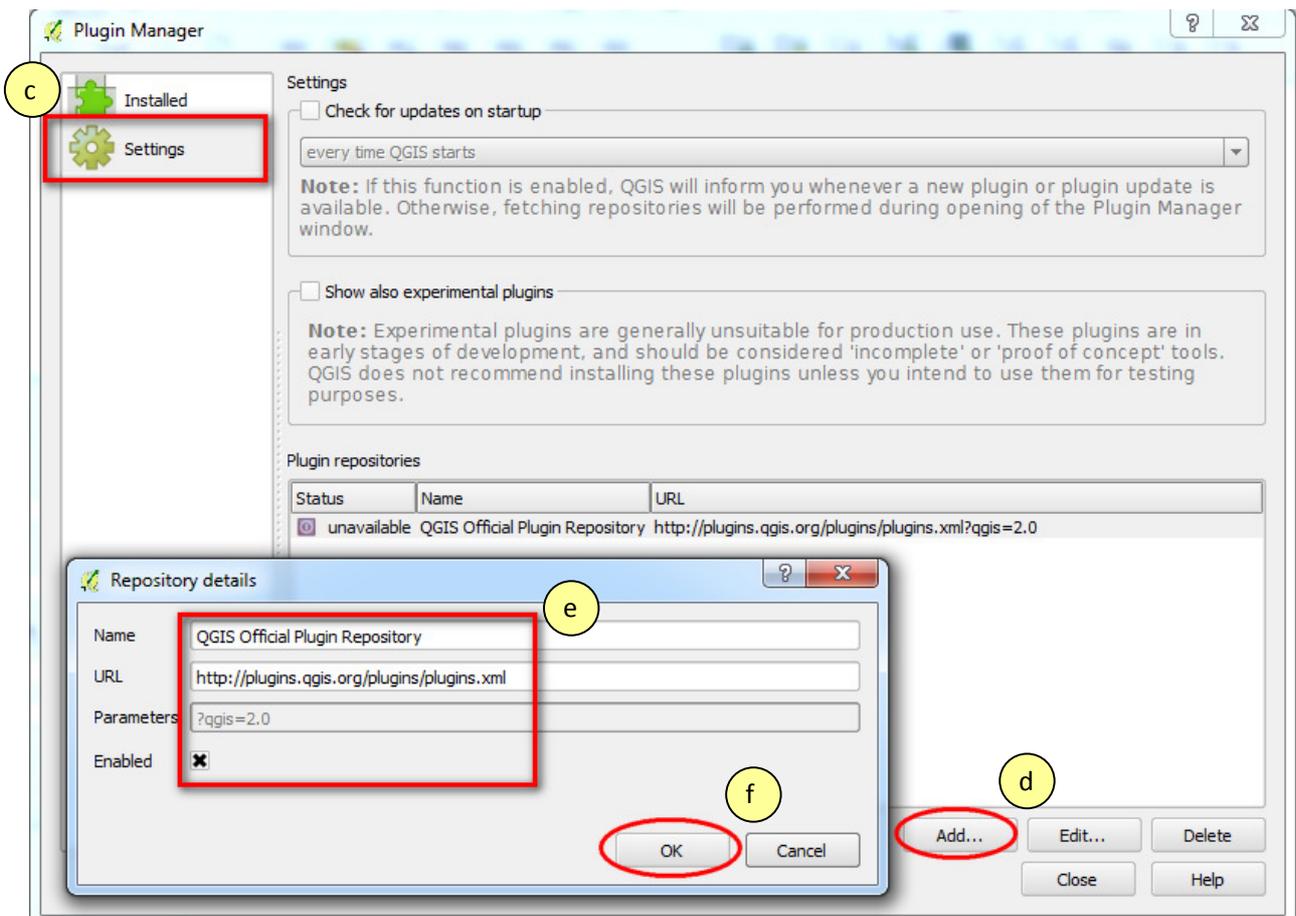
- a. Go to '**Plugins**' in menu bar and click on '**Manage and Install Plugins**'.



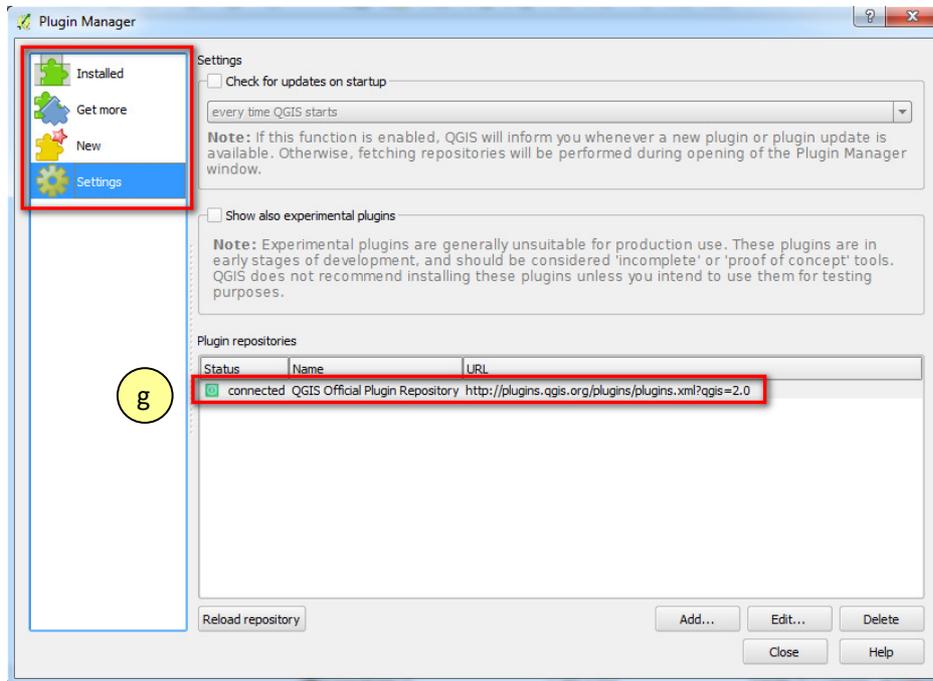
- b. The '**Fetching Repositories**' window will open up where list of available plugins are displayed.



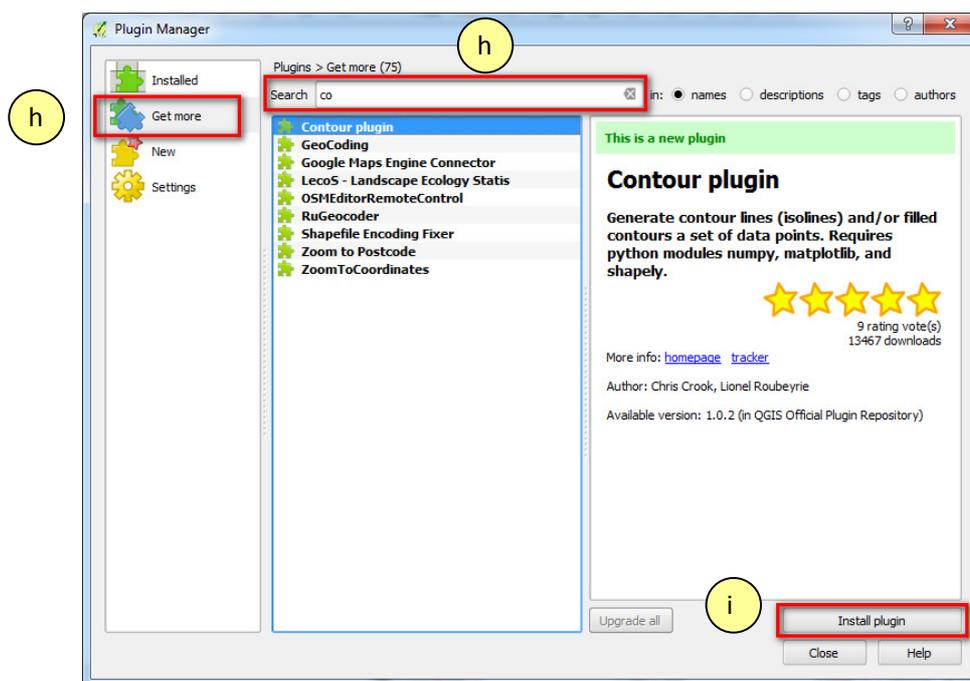
- c. If the plugin list is not displayed, go to **'Settings'** tab in **'QGIS Python Plugin Installer'** window.
- d. Click on **'Add'** to add repositories details.
- e. Fill up the details as shown in figure below. And enable the check box besides **'Enable'**
- f. Click **'OK'** and the repository will be added this will solve the plugin display.



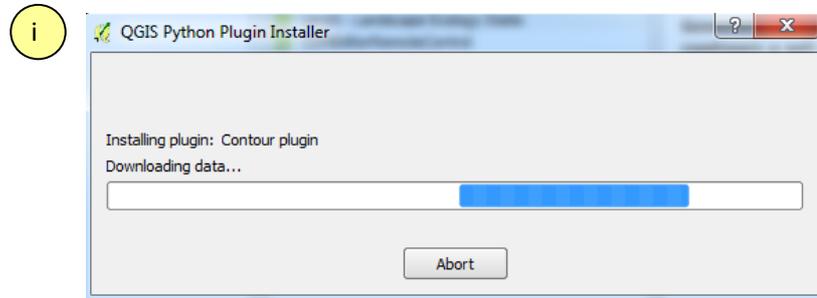
- g. Once you are connected with the QGIS Repository, the status will turn to **“connected”**



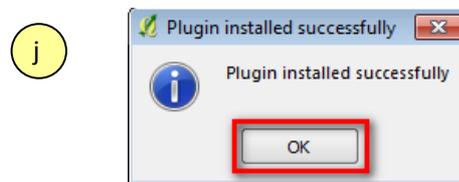
- h. Once the plugins list is displayed, you can search required plugin in 'Get More' by its name in search window or else directly scroll down the list and select the desired plugin.



- i. Once you select desired plugin the **'Install Plugin'** button will be enabled. Just click on it and the plugin will start downloading and will install into QGIS.



- j. Once you finish installing the plugin, following message box will be seen. Click **'OK'** and close the **'Plugin Manager'**

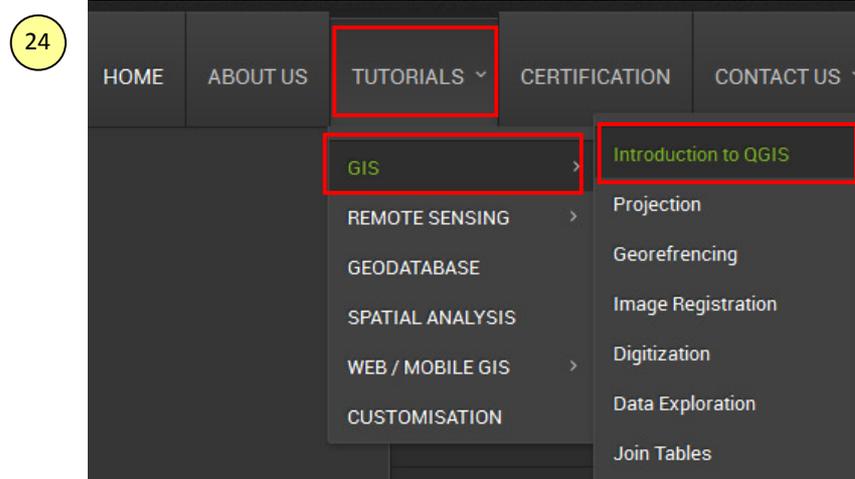


- k. Now installed plugin is ready to use.

Exercise 5: Downloading sample Data

23. Go to the www.iget-dst.in website.

24. Navigate to **'Tutorials → GIS → Introduction to QGIS'**.



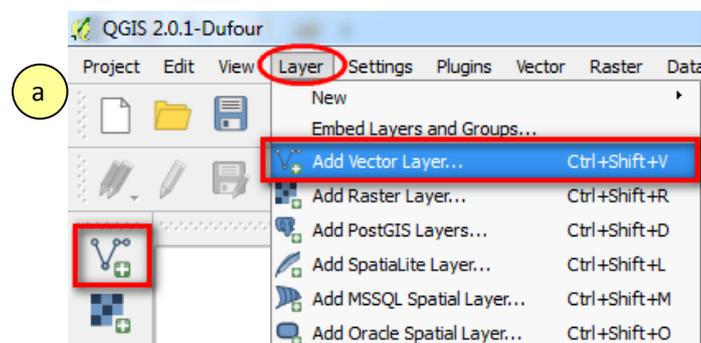
25. Now it will direct to the **'Getting Started with QGIS'**. Now click on **'Download Data'**.

26. Save the data on your local drive so that you can access it for next exercises.

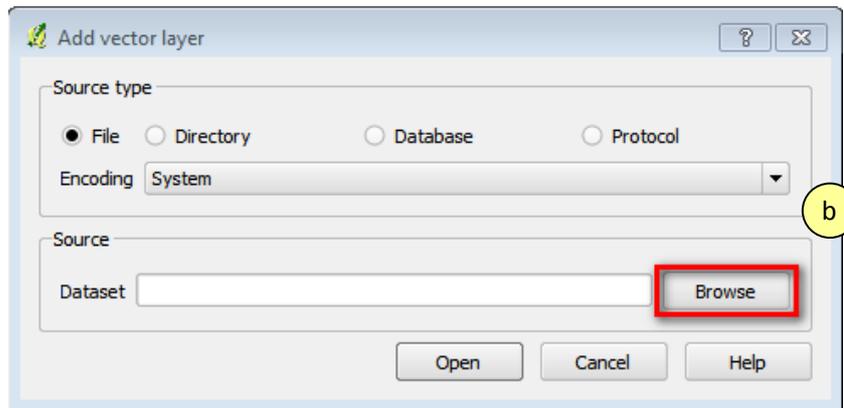
Exercise 6: Adding data to QGIS

27. **Adding Vector data:** In this section we will learn how to load a vector layer to the QGIS.

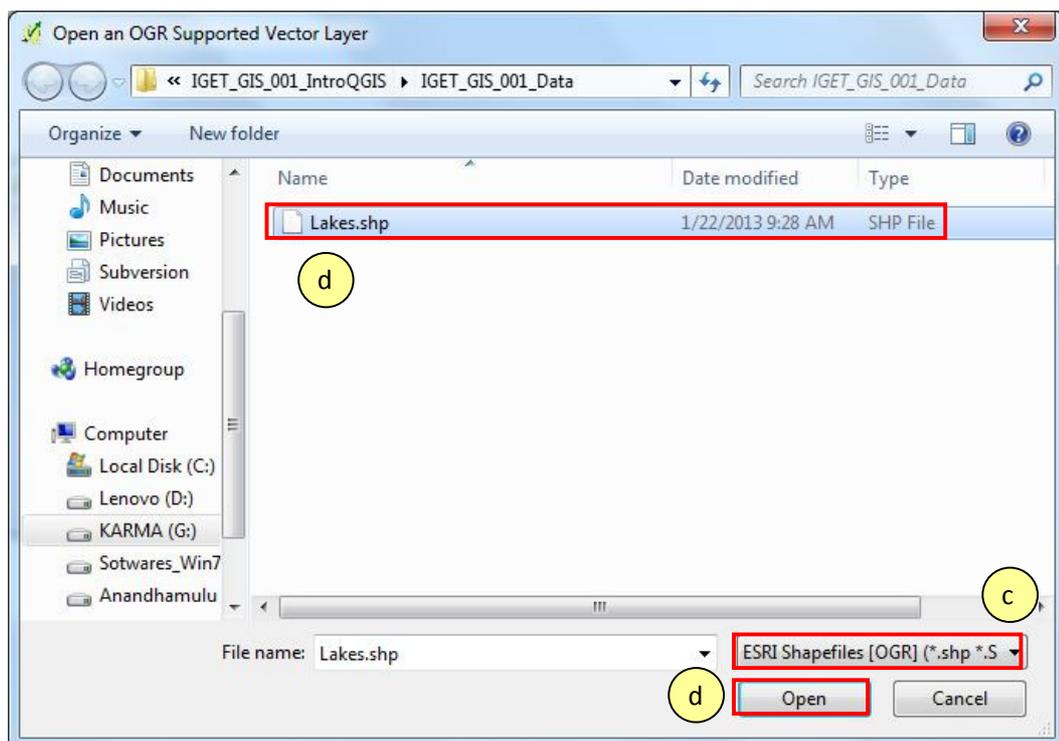
- To add vector layer go to '*Layer* → *Add Vector Layer*' or else directly click on  icon from the toolbar.



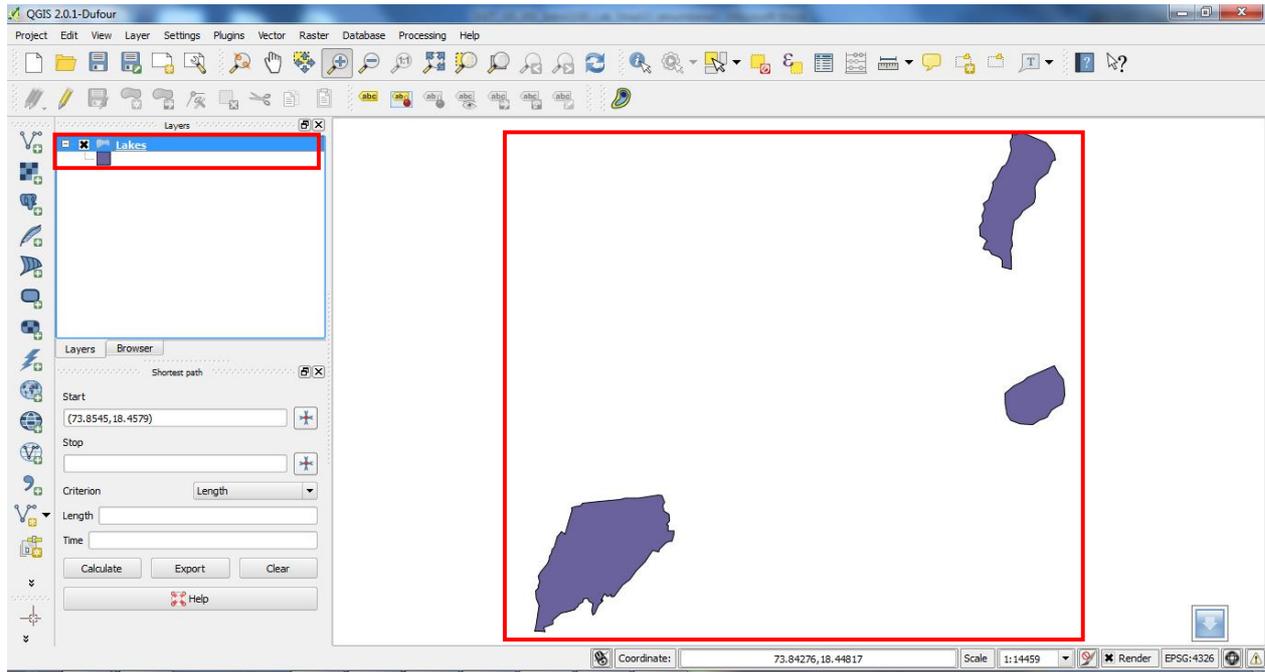
- Now '*Add vector layer*' popup window will open up. Click on '**Browse**'. Then you will be directed to a navigation window. Navigate to the local directory where you have saved the sample data downloaded in *Exercise 5*.



- c. Select the file type as ESRI shapefile[OGR], now all the shapefiles in the corresponding folder will be displayed.
- d. Select the 'Lakes.shp' file and click '**Open**' and again '**Open**' in 'Add vector layer' window.

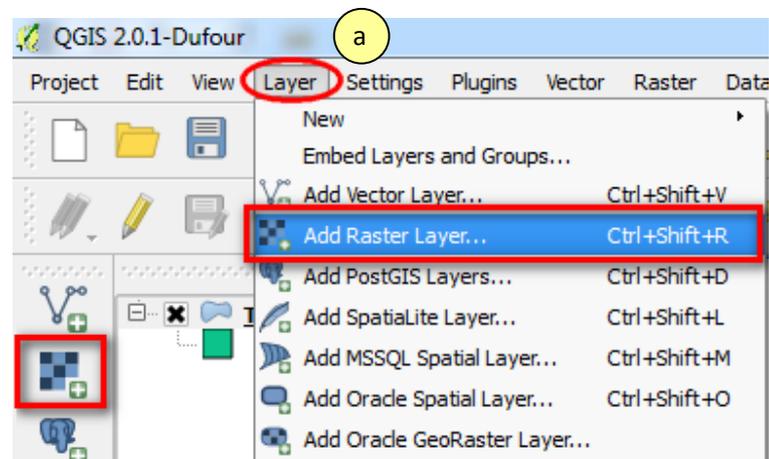


- e. Now vector layer will be loaded to your 'Map canvas'

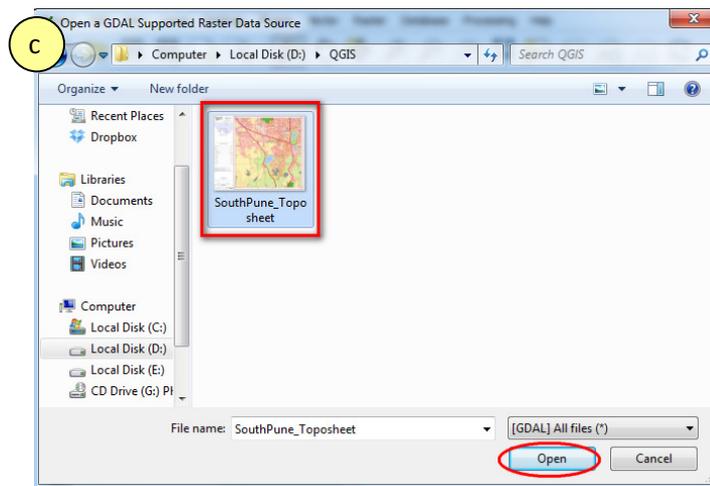


28. Adding Raster Layer

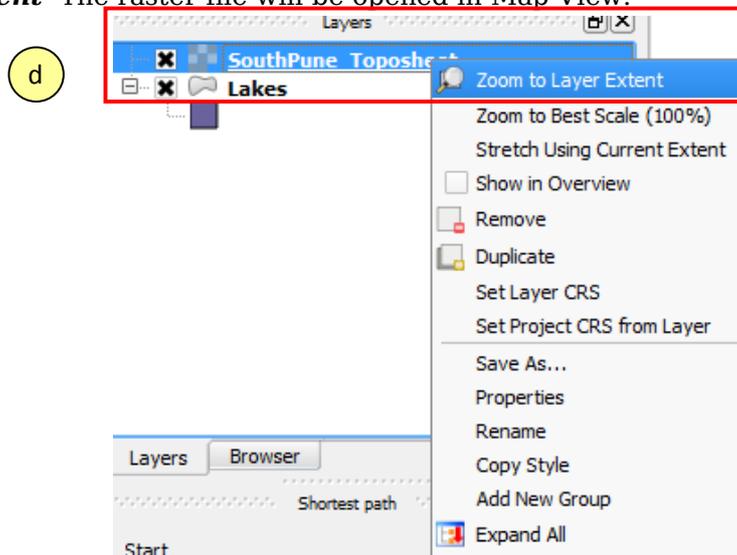
- a. To add raster layer go to '**Layer → Add Raster Layer**' or else directly click on  icon from the toolbar.



- b. Now '**open a GDAL supported Raster Data Source**' window will popup, click on '**Browse**'.
- c. All the raster format files will be displayed. Select the required file i.e., 'Southpune_toposheet.tif' and click '**Open**'. If 'Coordinate Reference System Selector' will window popup, click on '**OK**'.



d. Now *right click* on the 'SouthPune_Toposheet' layer under Layers → click on '**Zoom to layer Extent**' The raster file will be opened in Map View.



e. Now you can see the loaded South Pune Toposheet in the QGIS map canvas

