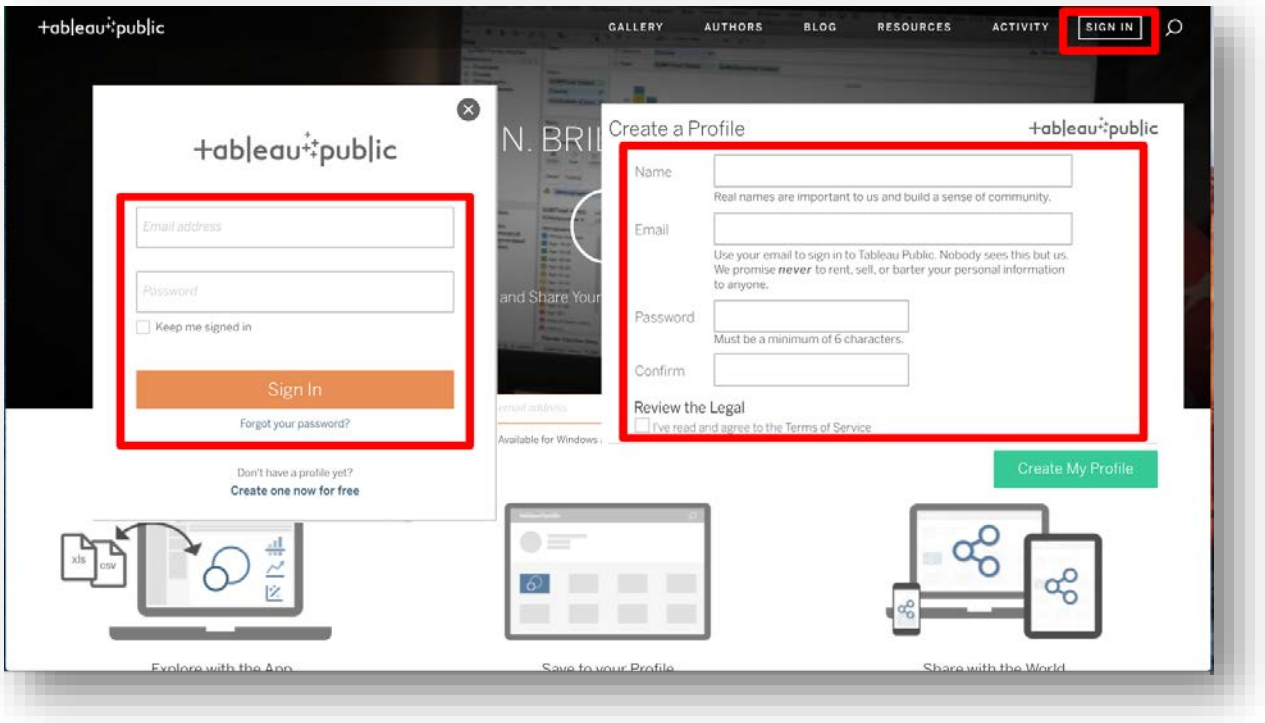
Lab 11: Tableau Public

Tableau Public is a free web-base analysis and visualization tool. It requires intermediate data cleaning and analysis skills Excel and a good understanding of data visualization concepts and design to use effectively.

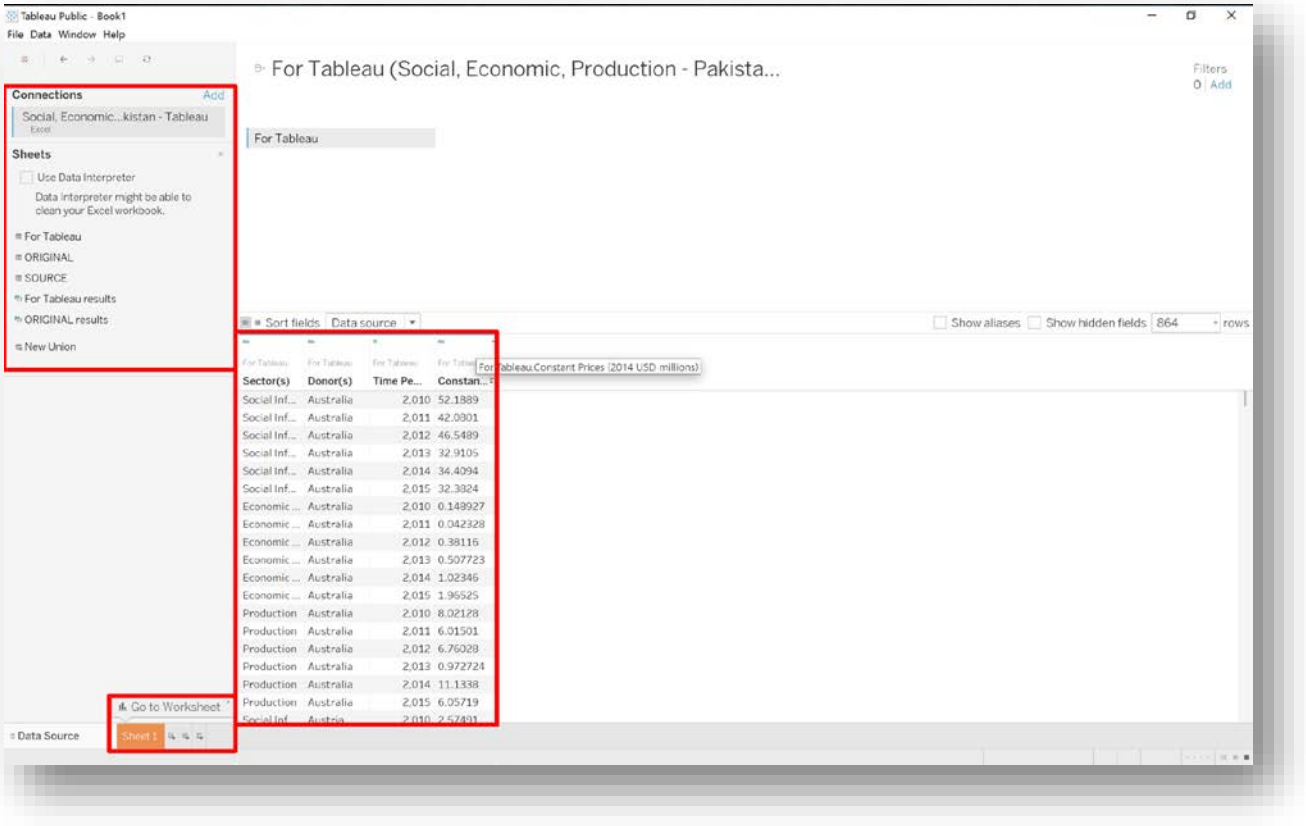
Visit https://public.tableau.com/en-us/s/gallery to get an idea of what is possible with this tool. In this lesson, we will be exploring data similar to the data in this story: https://www.chinafile.com/infographics/visualizing-chinas-aid-africa

Download the app for your operating system and create and account

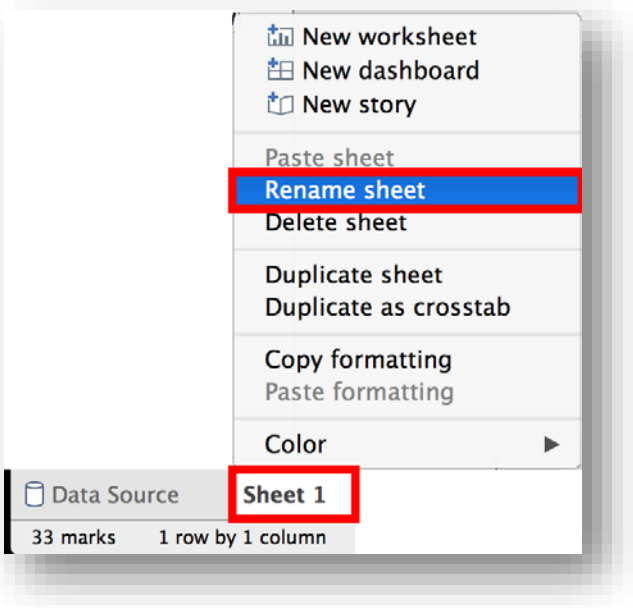


CONNECTING DATA

1. Open Tableau Public. ***Open Social, Economic, Production - Pakistan - Tableau.xlsx***, this file has the same data as the previous lab with some adjustments and the analysis is the same
2. In Tableau Public go to Connect Panel and click on Excel, select the file ***Social, Economic, Production - Pakistan - Tableau.xlsx***
3. As you see Tableau Public shows the File upload with the sheet(s) on it. Double click on the sheet *For Tableau*. Then you will see a preview of the data. Also, Tableau Public has a similar structure as Excel with a sheet or tab for each visualization or analysis. Go to the Sheet 1



4. Rename the worksheet as *Donors* by right clicking on Sheet 1 – Rename Sheet and change it.



5. VERY IMPORTANT: Tableau Public is a web-based tool. This means it has to be connected to the internet to work. Also, it is important to save your work NOW and PERIODICALLY to avoid lost your work.

a. Go to File – Save to Tableau Public

b. It is going to ask you to Sign In your account

c. Save with an acquired name

d. Tableau Public will automatically open a new tab in your default internet browser with the visualization or analysis.

6. Tableau Public organizes the data in the Excel file as numeric or non-numeric variables, geographical data, and date. In most cases, it works very well but sometime you need to reclassify a data type in a column. Basically, Tableau Public has five panels for each worksheet.

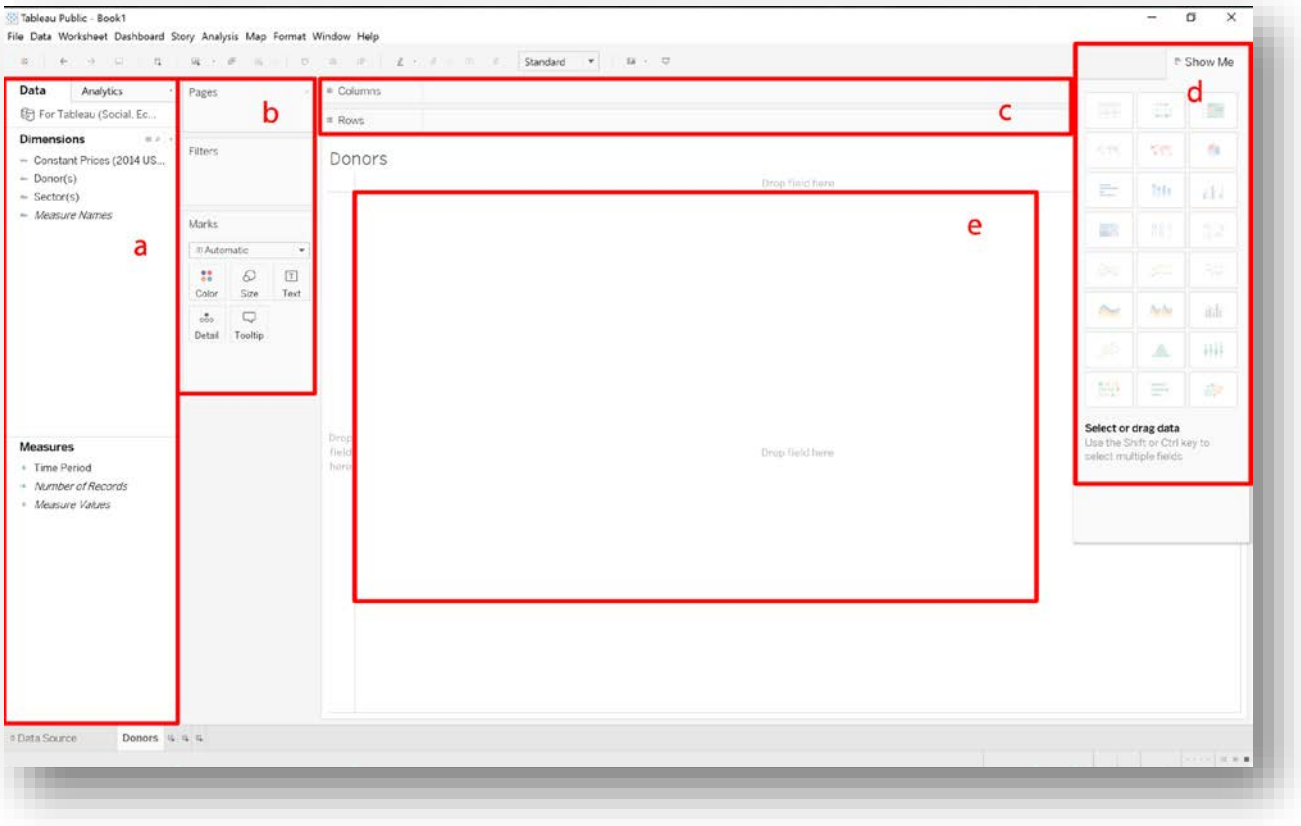
a. A panel with Dimensions and Measures. These are all the columns in our Excel file. Fundamentally, dimensions have no numerical data while measures have numeric data. The type of variable is show with Abc symbol, #, -# or Geographical icons. Check the left side of the variable.

b. A menu of tools to apply to the Dimension and Measures. We are going to use Filters and Marks.

c. All visualization data is organized in Columns and Rows. This menu allows you to see where Dimensions or Measures are located

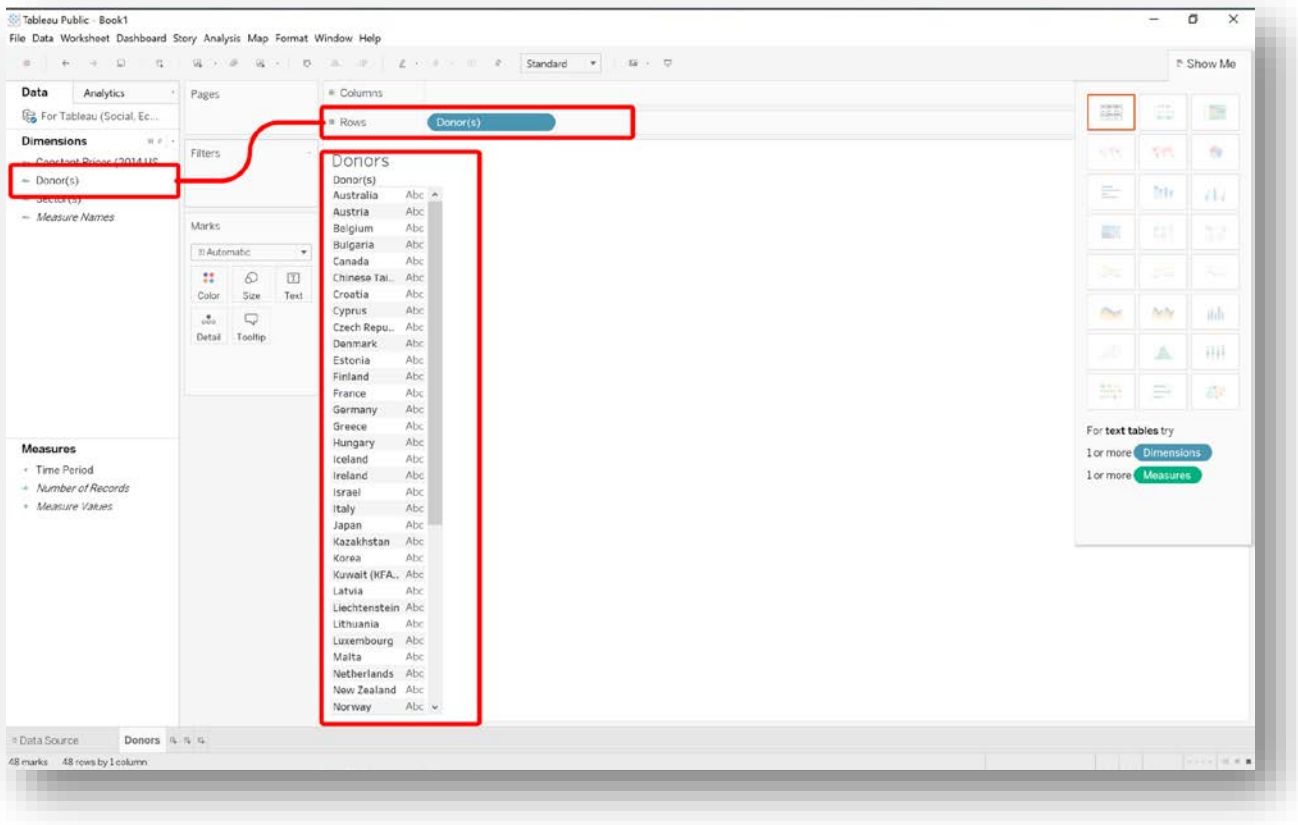
d. The Show Me tool helps you to understand what king of visualization you can use with the type of data that you drag in the different panels.

e. The panel with the visualization or analysis.

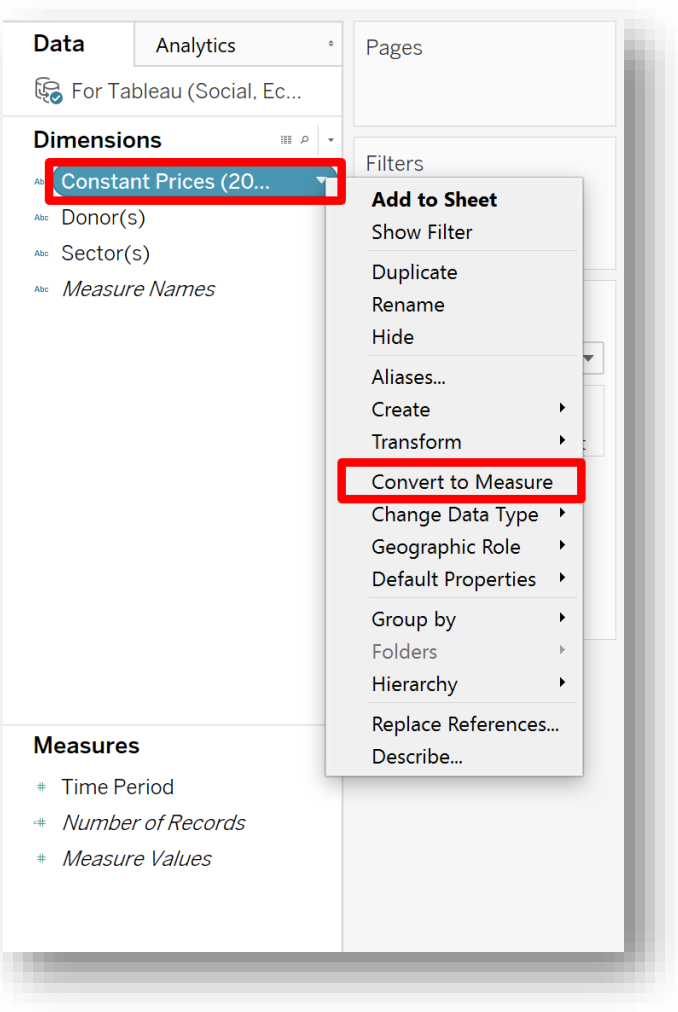


SIMPLE BAR CHART

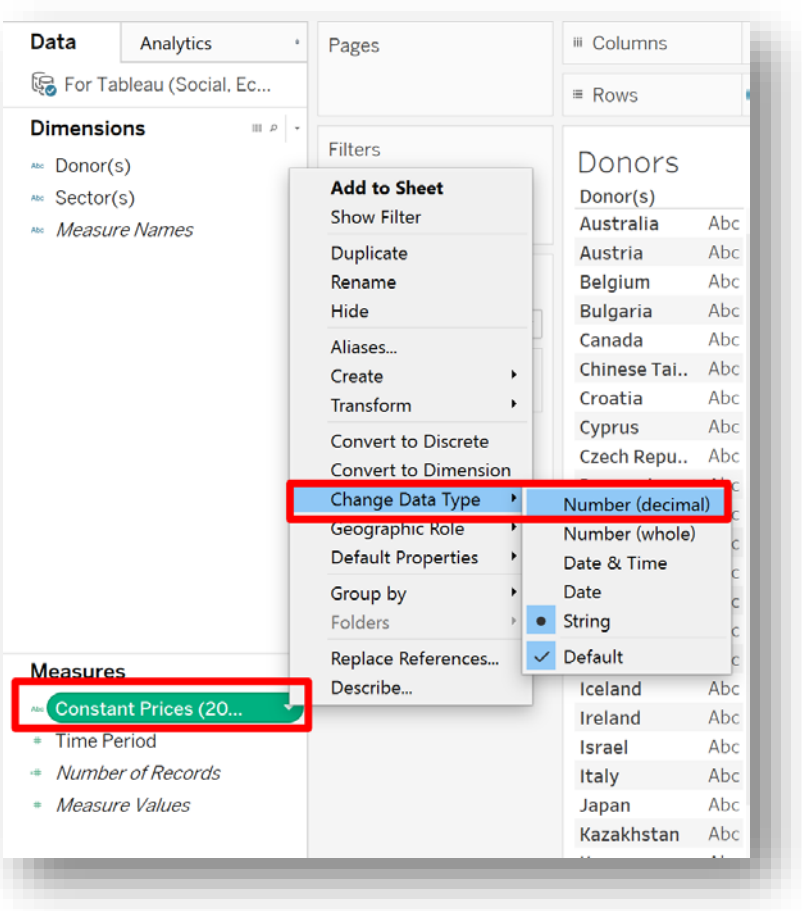
7. For this visualization, we are going to make a bar chart with the main donor to Pakistan. Click and drag Donor(s) from the Dimension Panel to Row Panel



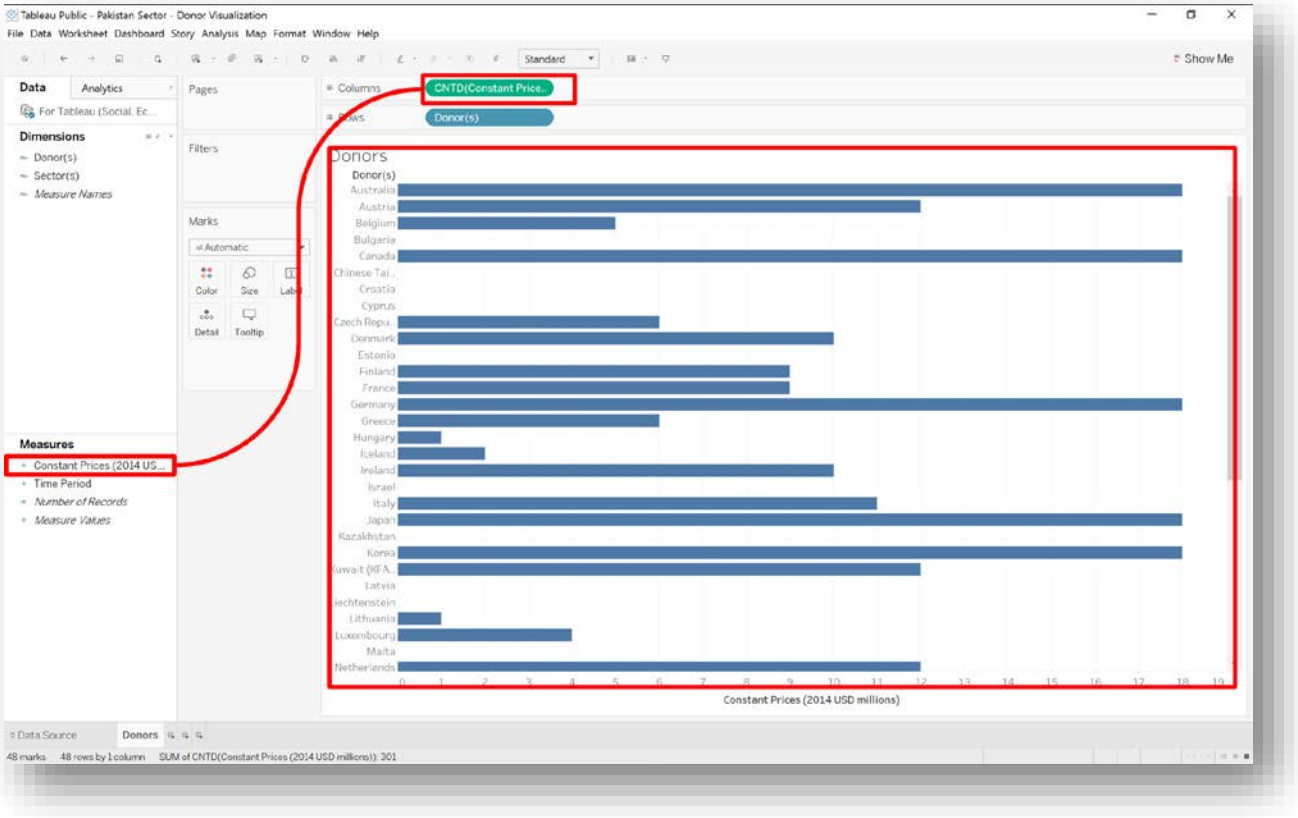
8. As you see, Tableau Public creates a list of the countries in rows. Now we need the contribution amount: in this case, Constant Prices (2014 USD millions). This variable is in the wrong location. It is numerical data so it should be in the Measures section. To change it, go the variable Constant Prices (2014 USD millions). It will change color and with the right arrow, click on Convert to Measure.



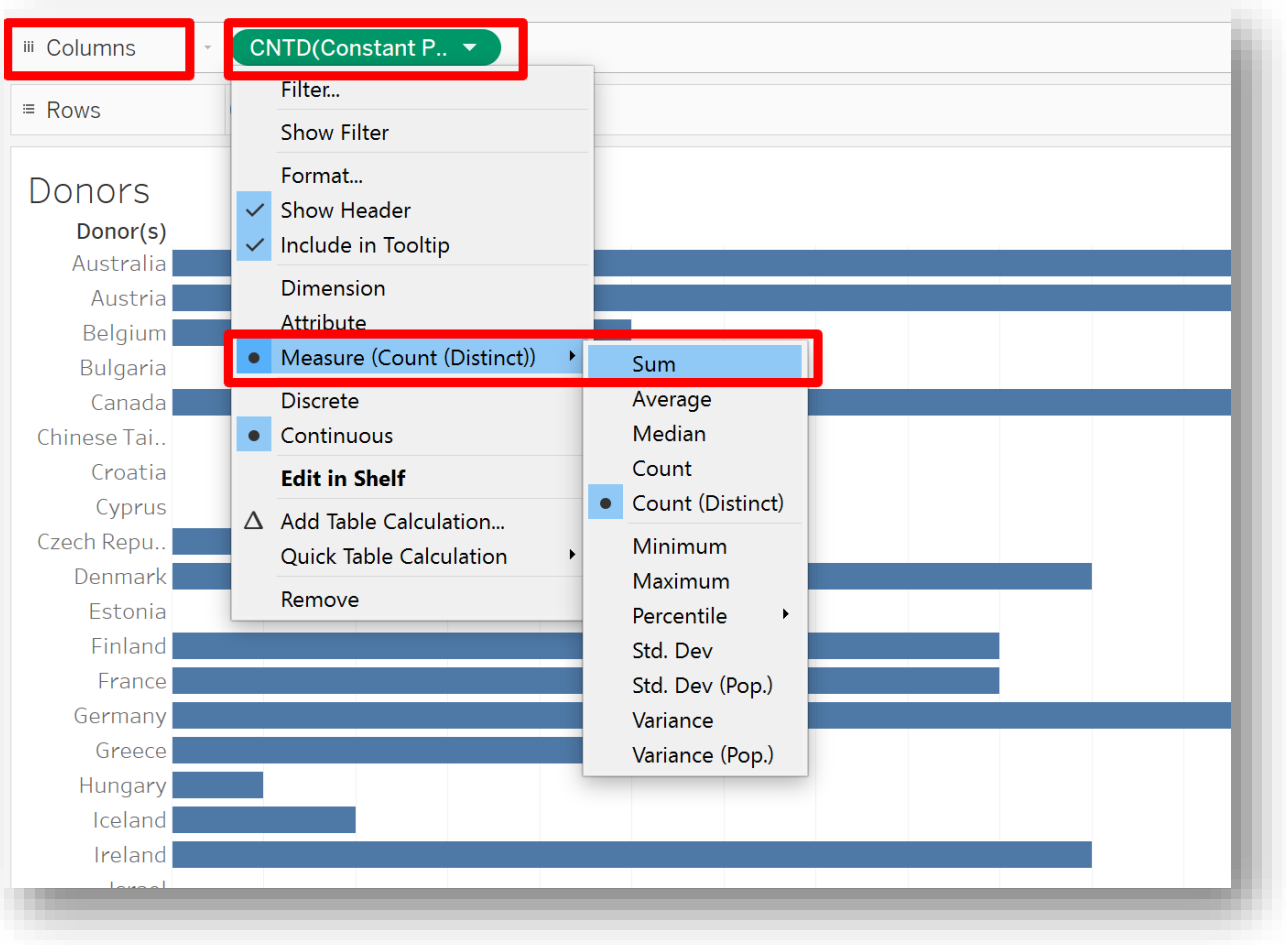
9. Next, we can see Tableau Public is showing Constant Prices (2014 USD millions) as a string or Abc type. We know this is a number (decimal) variable. To change, select Constant Prices (2014 USD millions), click on Change Data Type and select number decimal.



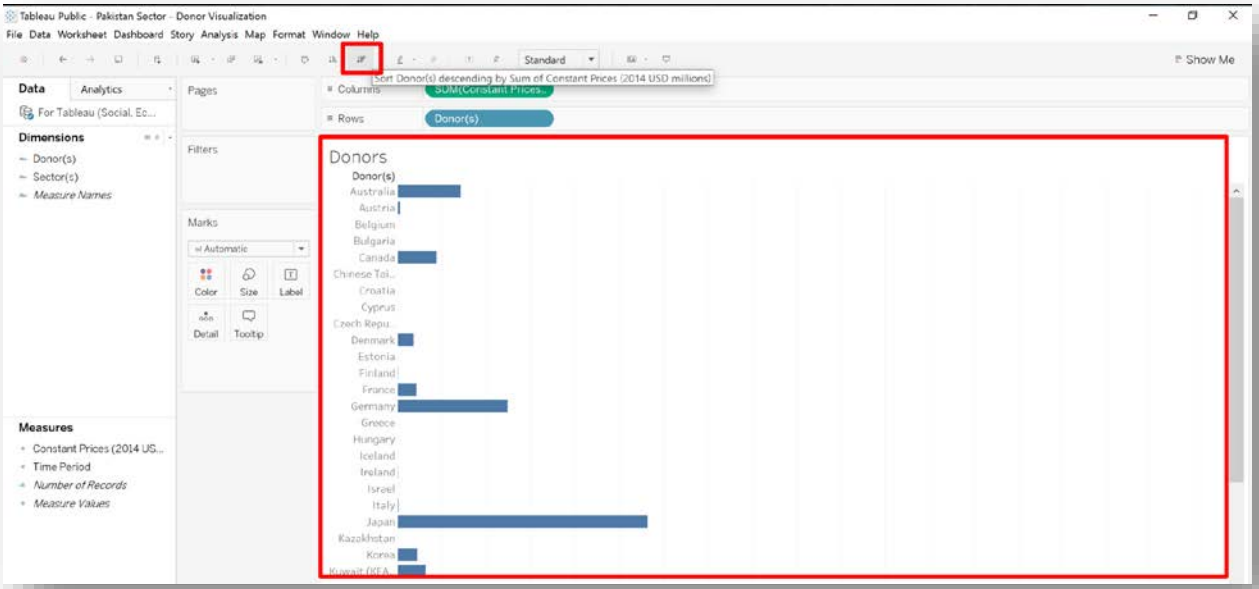
10. Now just click and drag Constant Prices (2014 USD millions) into the Column Panel.



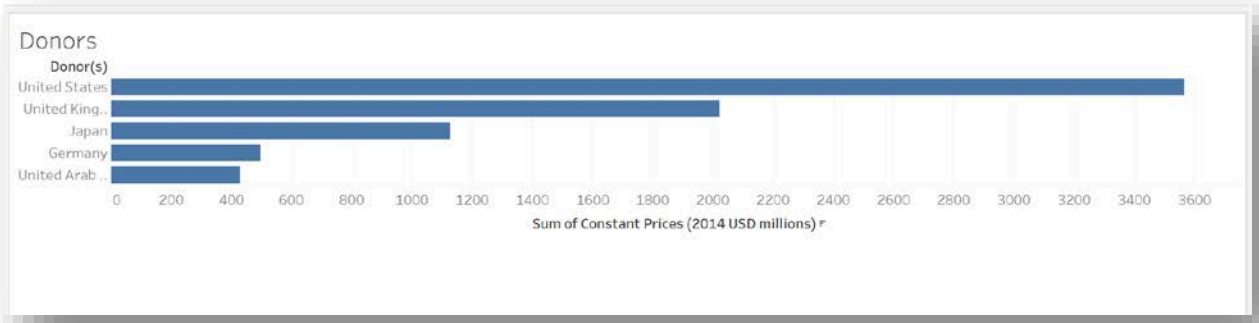
11. As explained before, Tableau Public is a tool for analysis and visualization. It does calculations when you include variables. For example, in the last step when you moved Constant Prices (2014 USD millions) into the Column area, Tableau Public by default did a Count of the element in Constant Prices (2014 USD millions) but we need a SUM operation. To change it go to Constant Prices (2014 USD millions) inside the Column Panel and in the options arrow on the right select Measure – Sum. Also, as you realize SUM or COUNT are not the only options for calculation. Explore another option for your data set and despite looking complicated, Tableau has powerful analysis features.



12. Now we have all the Donors and Contributions. We need to sort total contribution from largest to smallest.

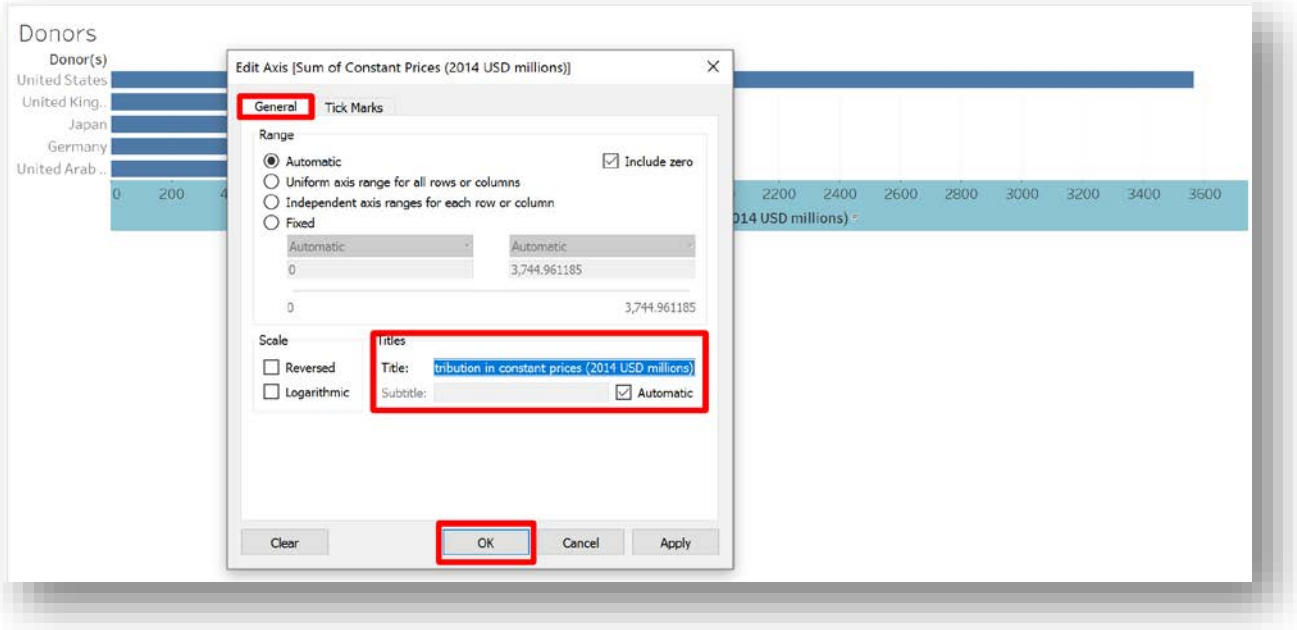


13. As you see, some Donors do not give aid to Pakistan or the contribution is minimal. For analysis, we will focus on the five biggest donors. To do this we are going to filter our data. Click and drag the Donor variable from the Dimension Panel to the Filter Panel. In the Filter [Donor(s)] window go to Top tab select By Field – Top – and type 5.

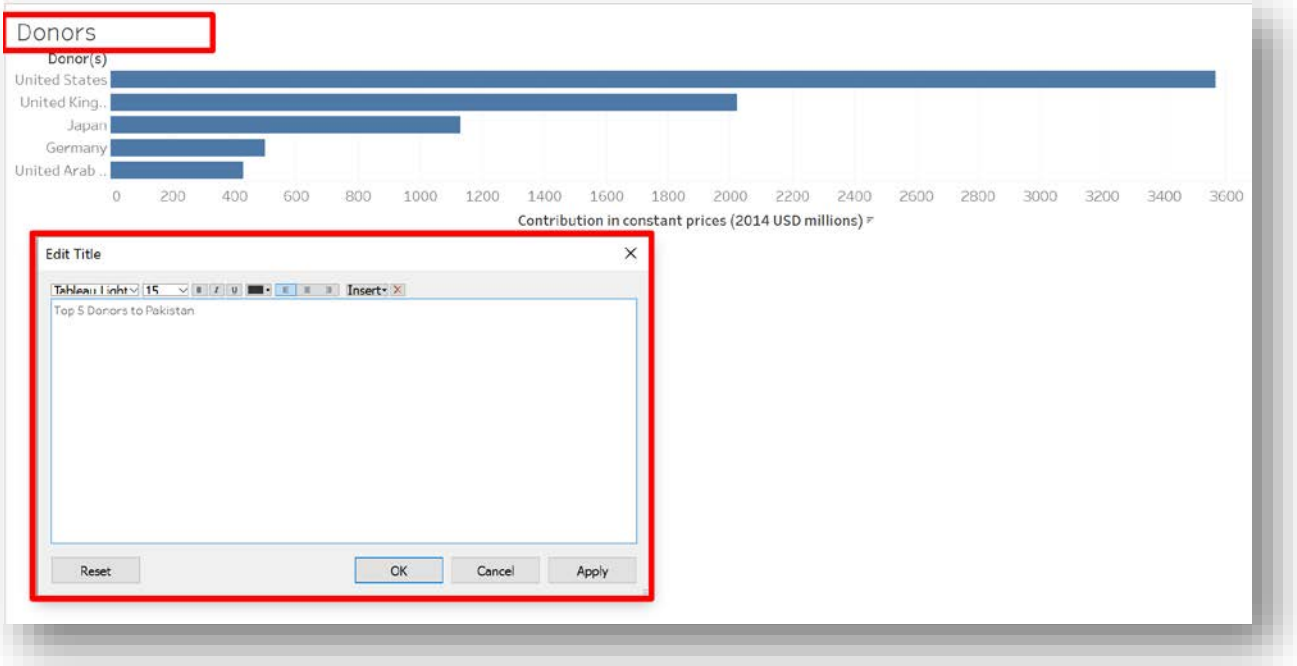


14. Now we have a nice bar chart with the main donors to Pakistan. Move the cursor inside the visualization and it will show a info-window with the information about the donor. But before go to the next visualization there are some configurations we need to change.

a. In the bar chart visualization double click on Sum of Constant Prices (2014 USD millions) to Edit Axis. In Edit Axis window – General – Titles change the title for a more accurate one such as Contribution in constant prices (2014 USD millions)

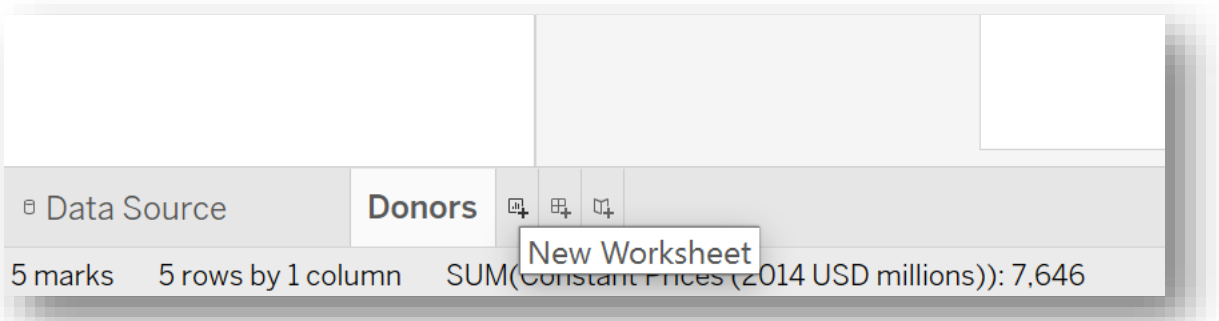


b. Every visualization by default has uses the name of the sheet as the title. To change it double click on it and change to Top Five Donors to Pakistan.

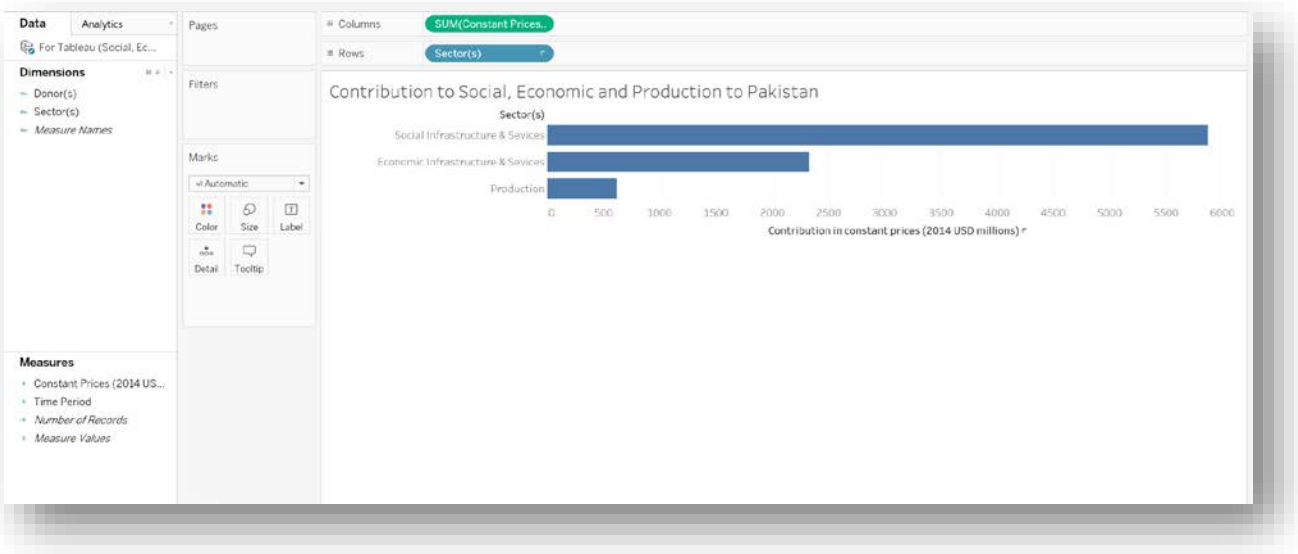


c. Mostly Tableau Public is a drag and drop tool: double click for configurations, click and drag the variable to create a visualization and use internal configurations to adjust calculation or analysis. Feel free to play with the application, keeping in mind the objective of the visualization or analysis.

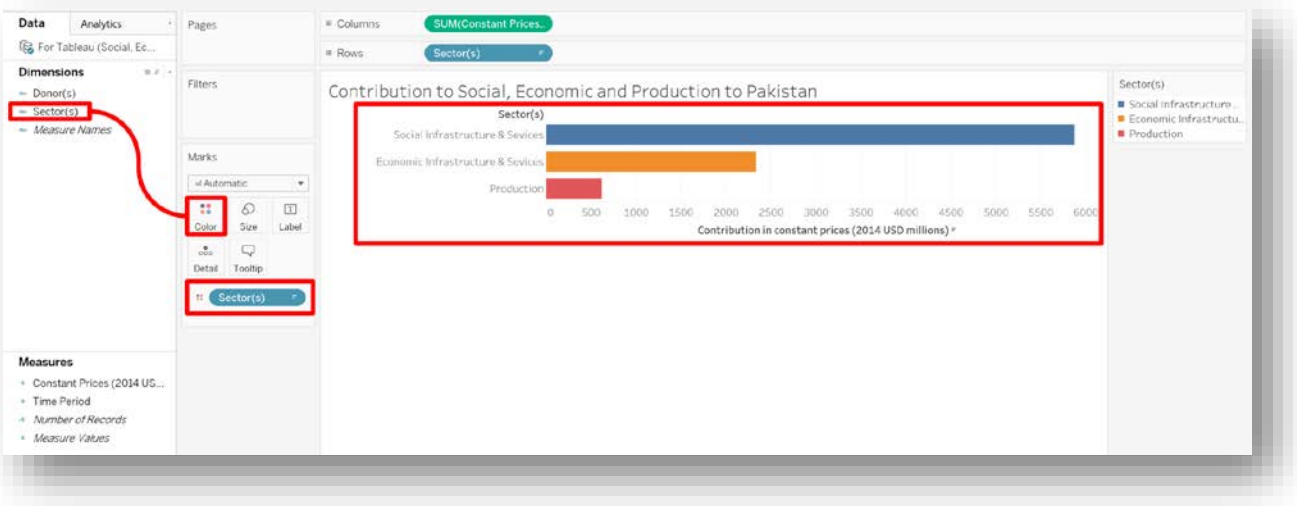
15. Now add a New Worksheet in the bottom panel. Rename as Sectors



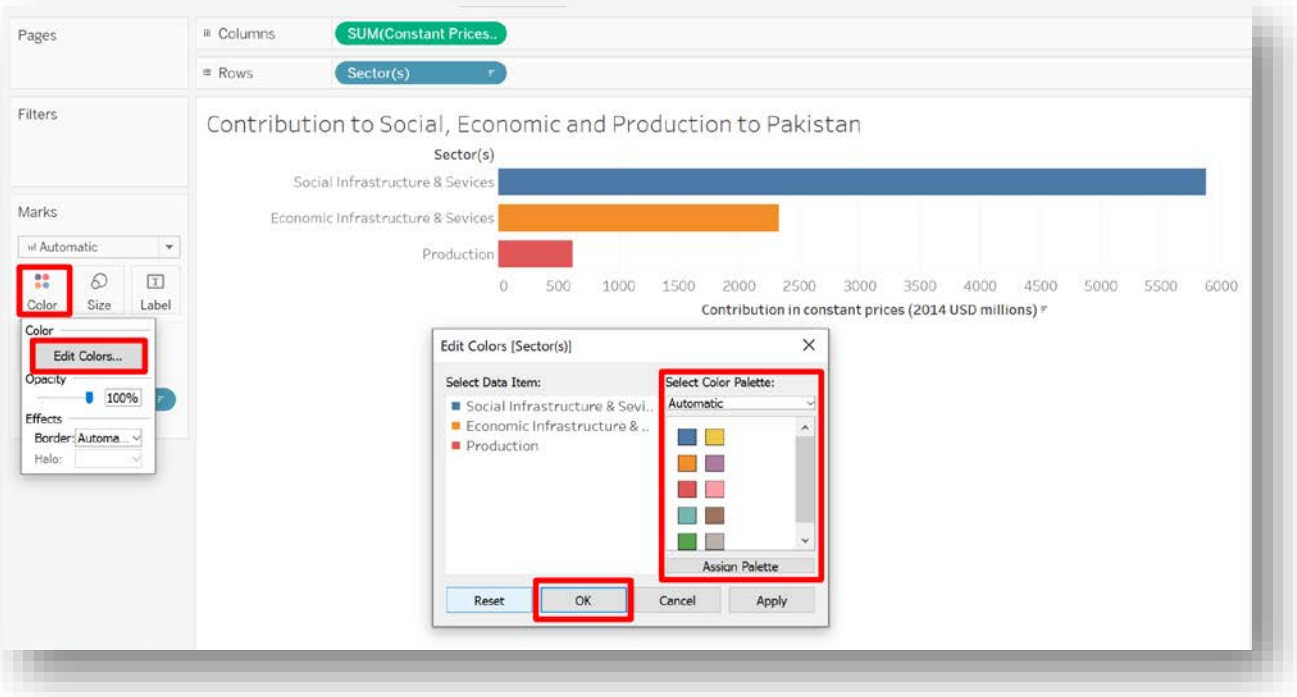
16. Click and drag Sector variable from Dimension panel to the Rows Panel.
17. Click and drag Constant Prices (2014 USD millions) from Measure panel to the Columns panel.
18. Change Constant Prices (2014 USD millions) from COUNT calculation to SUM.
19. Sort Sector largest to smallest
20. Edit axis for a more accurate description.
21. Edit visualization name for more accurate description.



22. Now we need some colors, click and drag Sector from Dimension Panel to Mark – Color Panel



23. Change bars color by dragging Donor into Marks Color and clicking on Mark – Color – Edit Color. There are some options in the Edit Color window by Select Color Panel. Remember to match colors with the other visualizations, web page or publication.



TIMELINE

24. OK we still have some data to play with. One variable is Time Period, so let's make a line charts with the development of contributions by year and by sector. It may help to analyze the data. First create a new worksheet and rename it as Time Period.

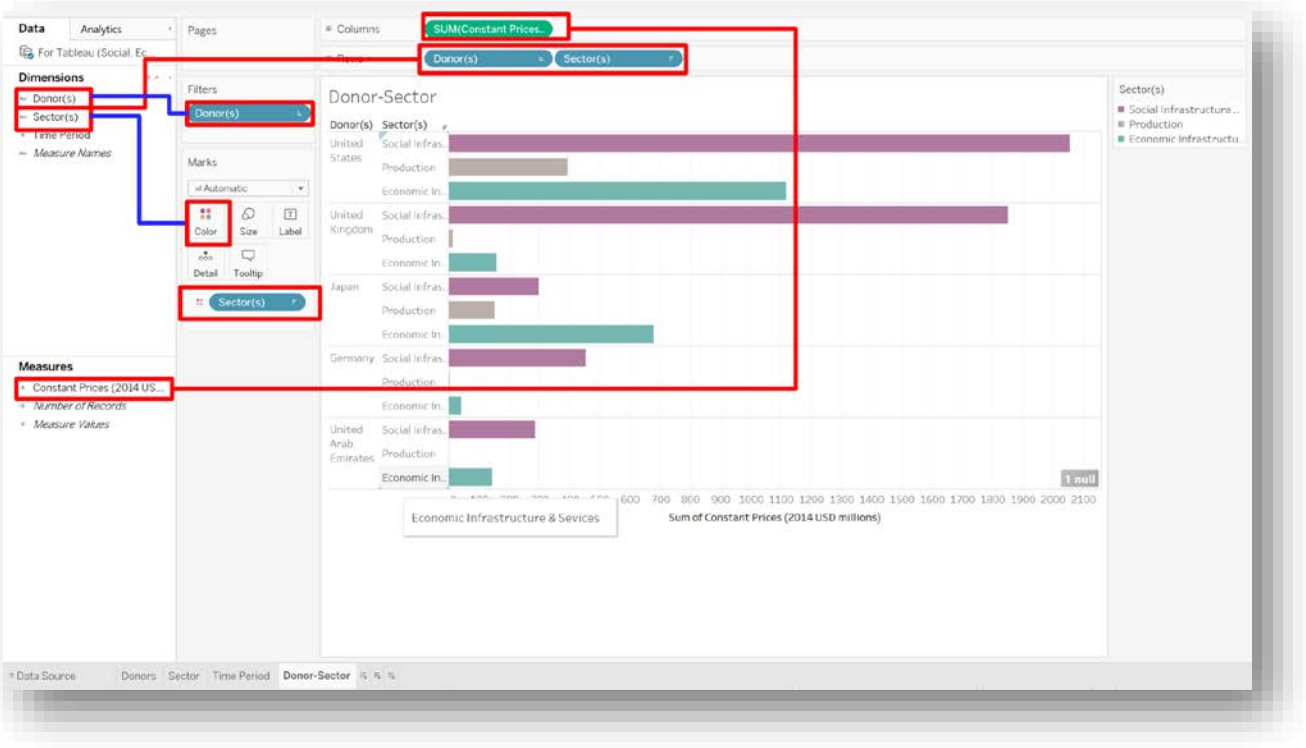
25. The variable Time Period is in Measure. Change it to Dimension.

26. In the Time Period sheet, click and drag Time Period from the Dimension panel to the Column area.

27. Click and drag Constant Prices (2014 USD millions) from the Measure panel to the Rows area.
28. Click and drag Sector to the Marks area.
29. Change Constant Prices (2014 USD millions) from COUNT to SUM.
30. In the Mark panel change automatic chart to line.
31. Change the colors to a color palette that matches the other colors.
32. To widen the timeline, hover over the edge and drag right to the edge of the workspace.
33. Edit axes for more a more accurate names.
34. Edit the visualization name for a more accurate name.
35. One conclusion we can see is Social contributions have increased by about 100 million dollars in six years while Economic contributions have increase around 350 million dollars in the same time periopd with some fluctuations (for better analysis calculate the percentage change).

DOUBLE BAR CHAT

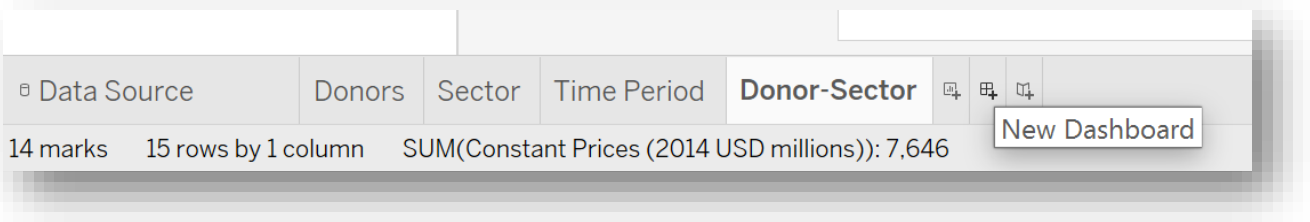
36. Now let's combine Donors and Sector in a grouped bar chart. Create a new worksheet and rename it as Donor-Sector
37. Click and drag Constant Prices (2014 USD millions) from Measure panel to Columns panel
38. Change Constant Prices (2014 USD millions) from COUNT calculation to SUM
39. Click and Drag Donor and Sector from Dimension panel to Rows panel
40. Click and Drag Donor from Dimension panel to Filter panel and filter the top 5
41. Click and Drag Sector from Dimension panel to Marks Color panel, change color if it is necessary. Tableau will keep the last selected color for this variable.



42. Change the order of the Donors by clicking on the Donor and moving it inside the visualization.
43. Edit axis for a more accurate name.
44. Edit visualization name for a more accurate name.

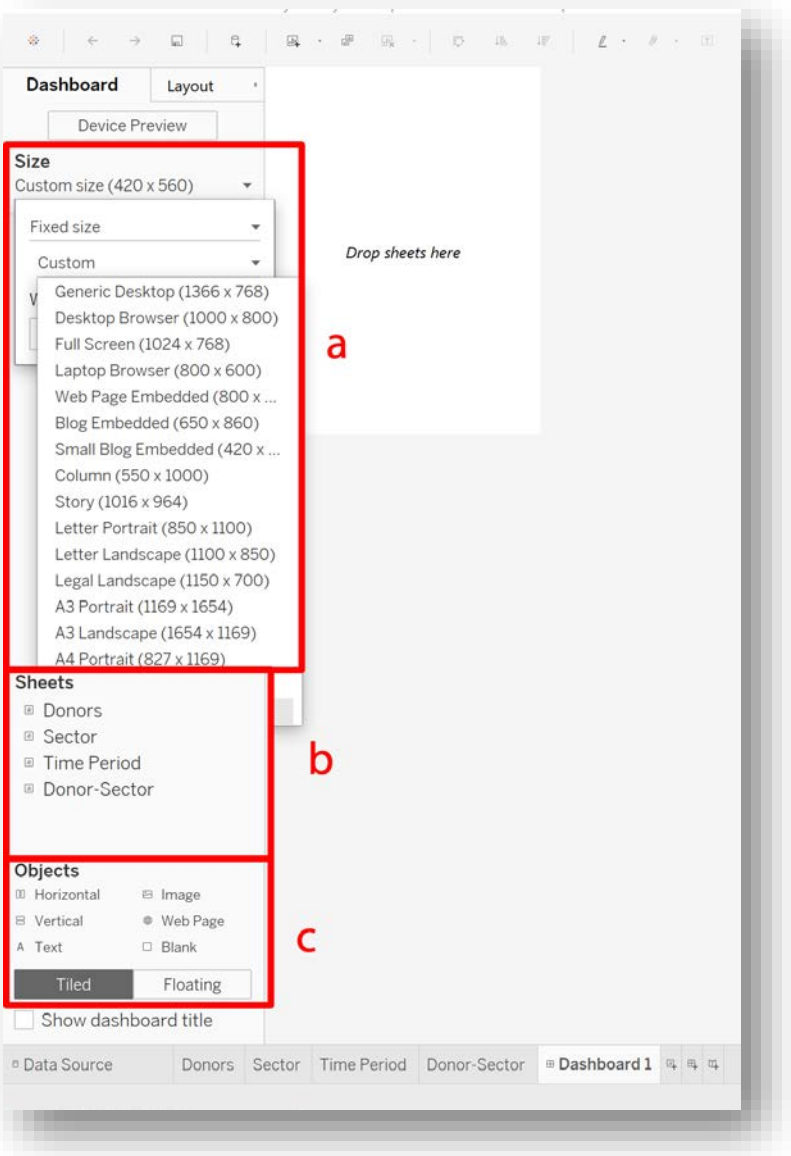
DASHBOARD AND INTERACTIVE CHART

45. Tableau Public worksheets are the place to build visualizations and do analysis of your data. For publishing them, we use the Dashboard sheet. In the bottom panel click on New Dashboard. Rename the Dashboard as Interactive Visualization.

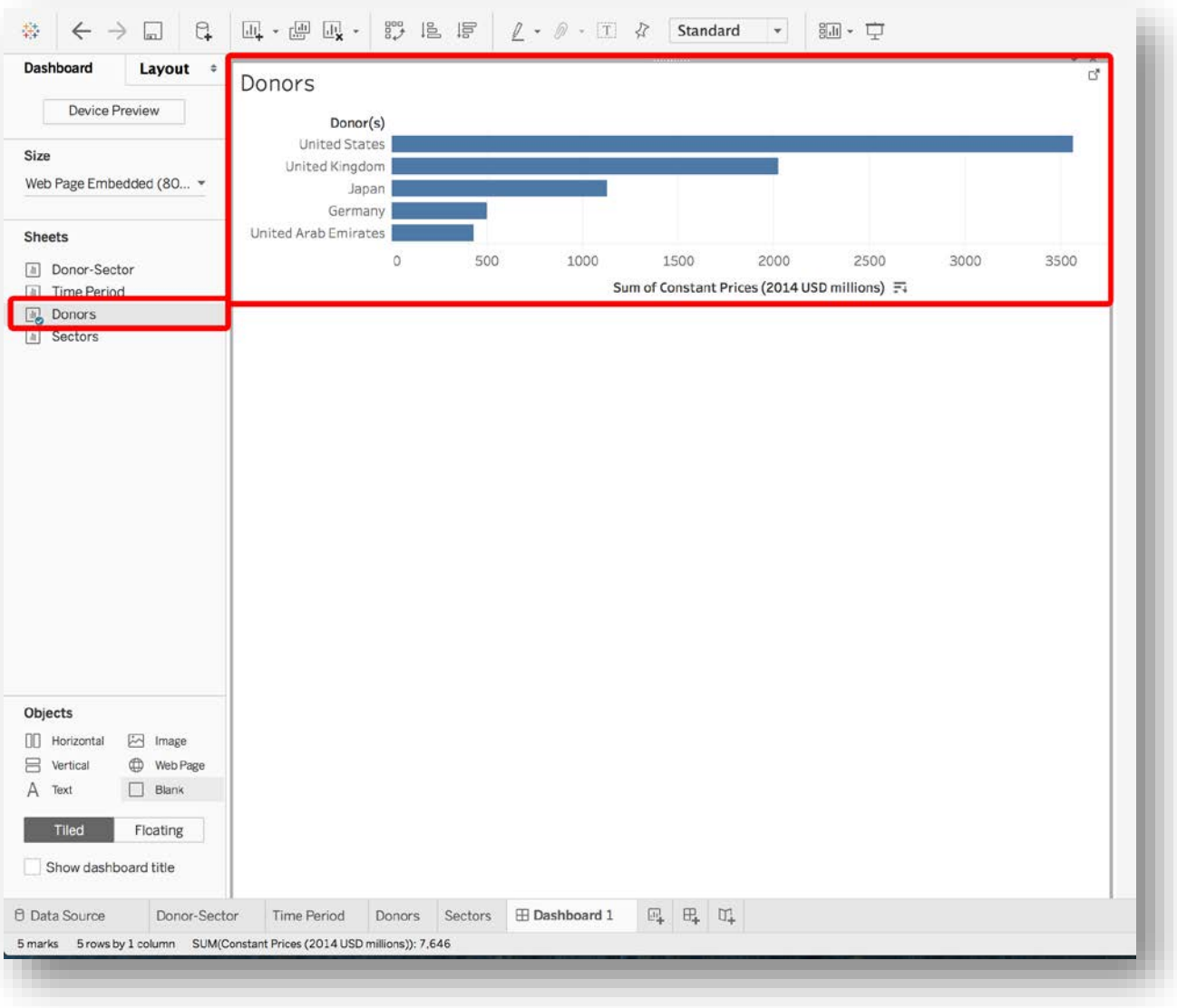


46. A dashboard is a sheet that contains one or more visualizations. It also provides space to give more information about the visualization or analysis. It has options to add text, images, and web pages. Dashboard is the sheet that you use to publish your work and format the size of the publication. The left panel in Dashboard provides all these options.

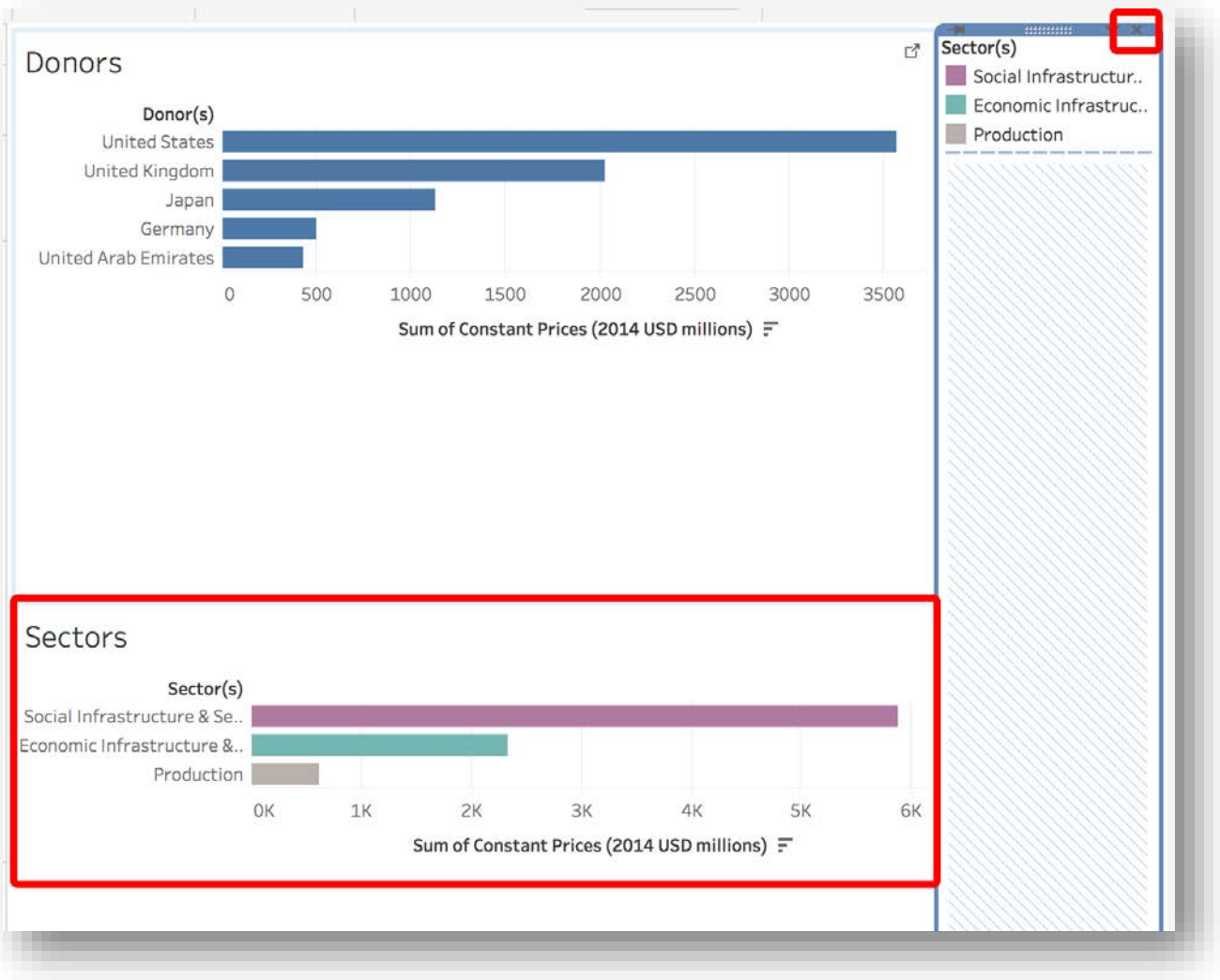
- **a.** Size: Define the size of the dashboard. As you can see, there are many different size. Let's try the Web Page Embedded size under Fixed Size.
- **b.** In the Sheet panel are the worksheet visualizations.
- **c.** And in object are options for including different objects in the dashboard.



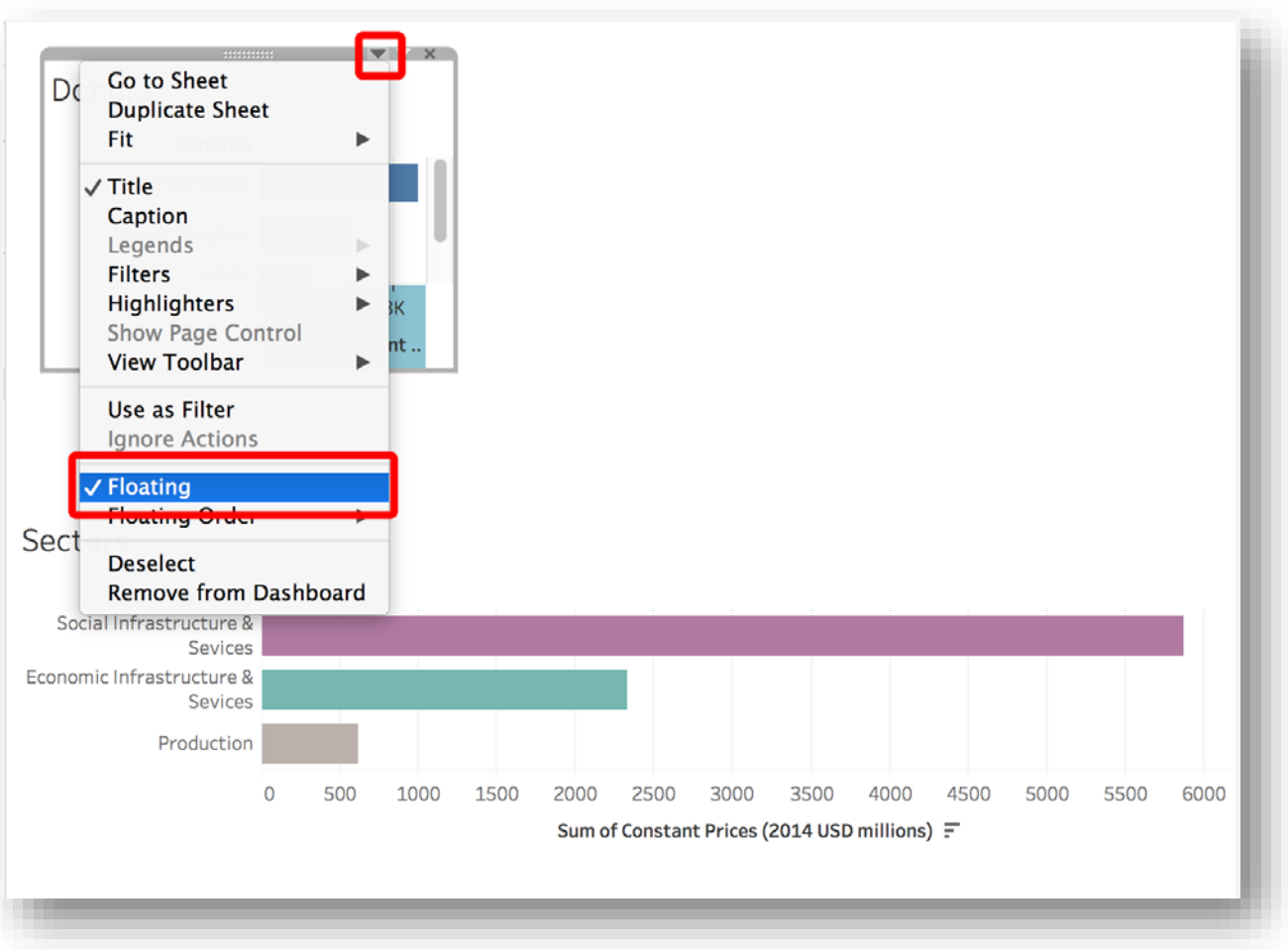
47. To put a visualization in the dashboard, click and drag the Donor sheet from the Sheet panel to the Dashboard. Another way to put a visualization in the dashboard is by double clicking on the Donor sheet in the Sheet panel.



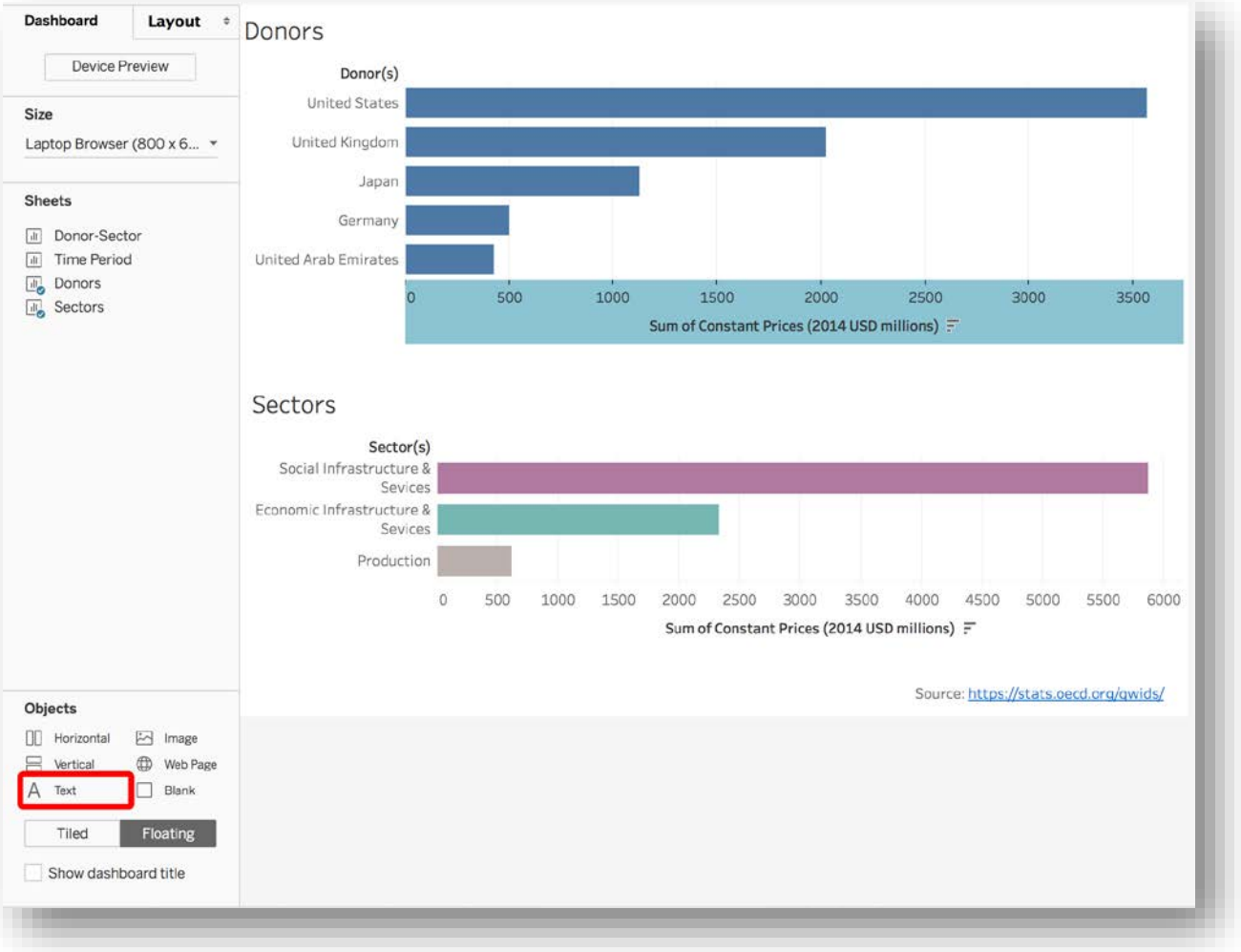
48. Double click on the Sector sheet from Sheet panel to add to the dashboard. As you see, the Sector sheet has two components: the visualization and its explanation by color that we really do not need. To exclude, click on the Sector explanation color and click on the X on the right corner.



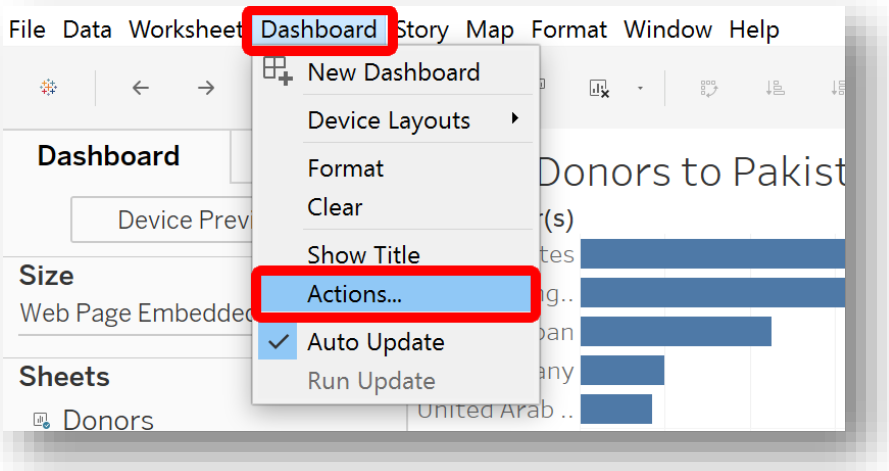
49. To resize or organize the visualization inside the dashboard, it easier to configure them as floating object by selecting the visualization sheet and clicking on the small arrow in the upper-right corner and on the option use floating. Or, just select floating at the bottom left menu.



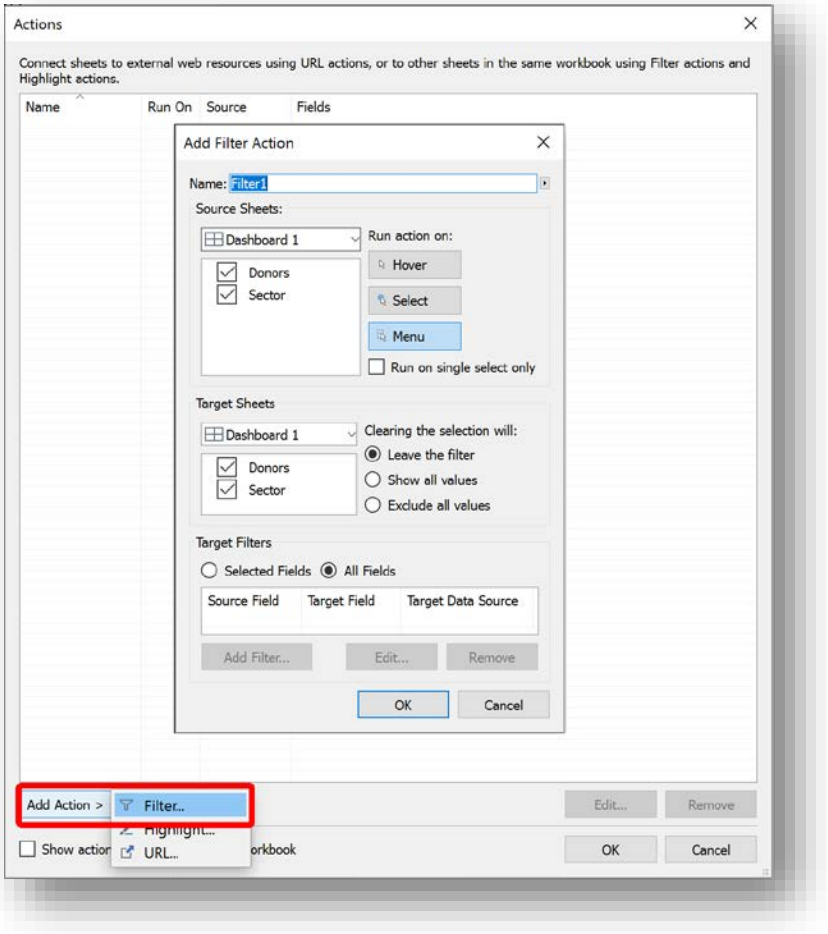
50. Add a text with the Source of the data set by clicking and dragging Text from the object panel to the Dashboard. Type *Source: https://stats.oecd.org/qwids/*. Resize and organize the dashboard



51. To make an interactive visualization, use the Action tool in the Main panel – Dashboard – Actions…



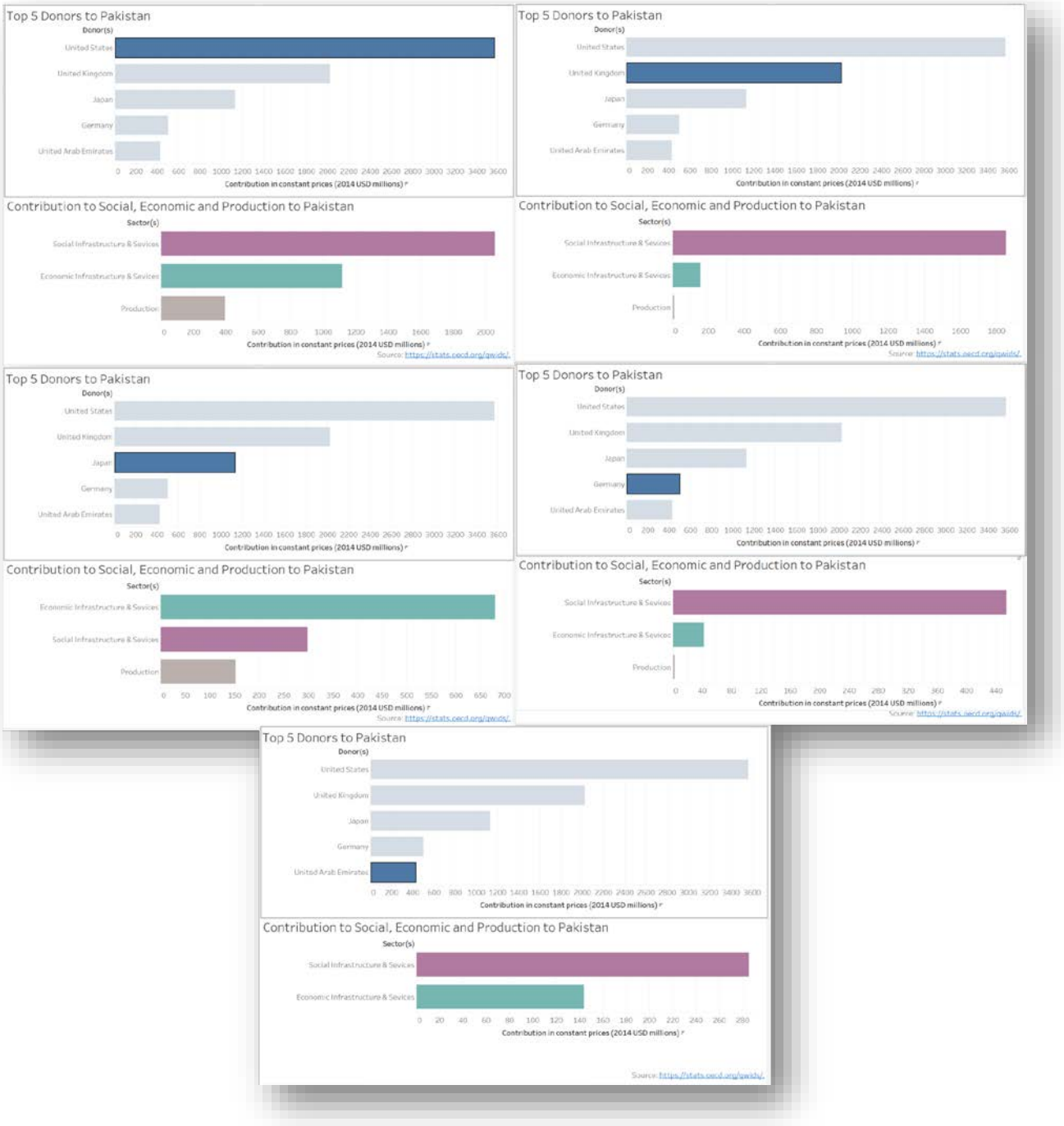
52. Click on Add Action – Filter



53. In Action Filter there are two main panels: Source Sheets and Target Sheet.

- **a.** In the Source Sheet, enable just Donor. That means that the Donor visualization is the source of the action
- **b.** Enable Select, that means when an object in the Donor visualization is selected, it will initiate the action.
- **c.** In the Target Sheet enable just Sector. That means the action is going to be reflected on the Sector sheet
- **d.** And enable Show all values. That means the filter that we apply on the Sector sheet will run when the action is activated.
- **e.** Click on ok and ok

54. Select any country in Donor visualization and it should change the amount of contribution for each sector.

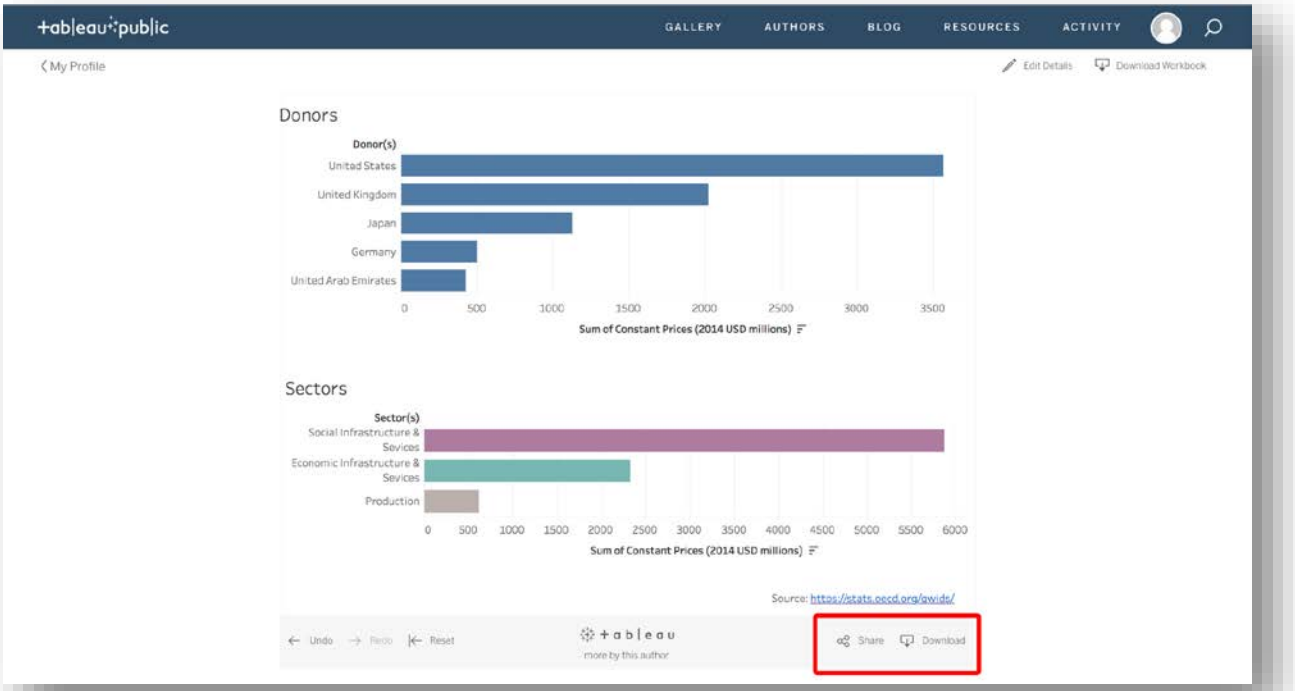


55. To reset the action, just click on the Esc key.

56. Save your work.

SHARE AND PUBLISH

57. As mentioned before, when you save your work in Tableau Public, it automatically opens the workbook in your computer's default browser.



58. Click on Share for Embed code or Link.

59. Click on Download to download the visualization as a pdf or image for paper publication.