WATER QUALITY AFFECTED STATES

INTRODUCTION:

Water is one among human basic needs. About seventy percent of the earth is covered by water. Water contains many minerals in it. We use water for multi purposes. Meanwhile we can aslo notice the damage caused to the water resources in many ways. The disposal of domestic wastes, industrial chemicals , plastic and many more contaminants are polluting water. When we consider India, there are states with water scarcity though India is surrounded by water on three sides. The percentage of ground water is constantly declining. Drinking water is availble in very least percentage. Preserving water and sanitizing water is very cruial for better health. There is large need of finding the pollutants affecteing the water bodies in states of India and take preventive measure to preserve water saftey. We can consider pollutants as water quality parameters. Less the amount of water qulity parameters higher the quality of water.

SECENARIO:

NRDWP has conducted a survey on water quality affected areas in 2011 and 2012. There is a large dataset of water quality affected habitations. They would like to know which states are being most affected and which water quality parameters are showing high impact on the Indian states.

PROBLEM STATEMENT:

India is a country with 29 states. States are further divided into districts , mandals, village panchayats. There are numerous water resources like rivers, lakes, ponds, water tanks, ground water. If we need to estimate the pollutants in any one resource of any one particular area, it is simple but when it comes to enumerous water resources , differenet states , large number of pollutants and different time periods, it is really tough to maintain the water quality. How can we find the water quality affecting states? Which parameter is highly present in Indian water bodies?

OBJECTIVES:

1. To analysis and visualise data of water quality affected habitates using tableau
2. To determine the states which are most affected in India.
3. Find the water quality parameter which is majorly affecting Indian states.
4. Preventive measures to save water from getting further affected by water quality measures.

CHALLENGES:

1. Can we find the most affecting water quality parameter among Indian states?
2. Which state is most affected by water quality parameters?
3. Which districts are most affected within most affcted states?

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DATASET DESCRIPTION:

DOMAIN: WATER & SANITIZATION

Water quality affected habitations as on 1st April 2011 and 1st April 2012

Dataset is collected from NRDWP (NATIONAL RURAL DRINKING WATER PROGRAMME)

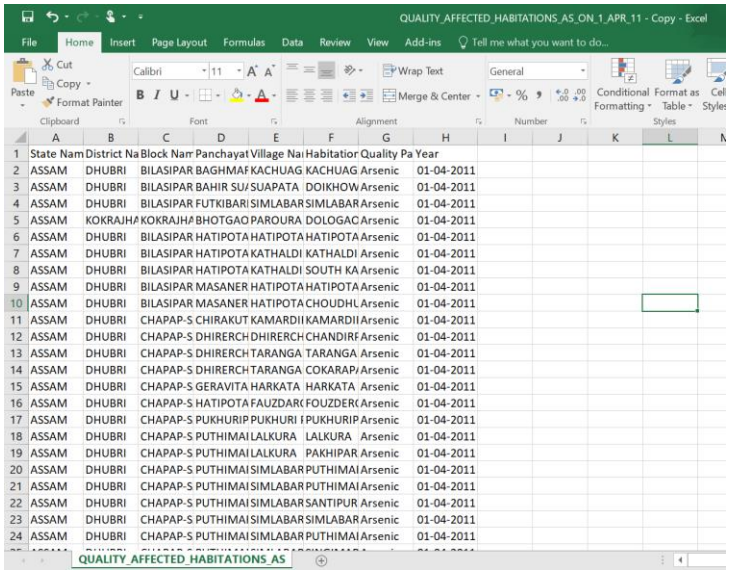
Downladed from the dataset repository : data.gov.in

Target : Quality parameter

Predictors : State Name, District Name, Date

Dataset Characteristics	**Multivariate**
Number of instances	226681
Number of Attributes	8
Atrribute Characteristics	Categorical , integer
Missing values	No

Attribute Number	Attribute	Value
1	State Name	Categorical
2	District Name	Categorical
3	Block Name	Categorical
4	Panchayat	Categorical
5	Village Name	Categorical
6	Habitation	Categorical
7	Quality Parameter	Categorical
8	Date	Integer



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QUERIES:

1. What are the water quality parameters affecting Indian states?
2. Can we rank the states?
3. What are the percentages of water quality parameters that are affecting each of the states?
4. Which states contains highest and least percentage of water quality parameters?
5. Is percentage of water quality parameters differ in percentage within a state?
6. Does any state is found without affect of water quality parameters?
7. Which districts of states are being affected by water quality parameters?
8. Can we find top 10 districts which are affected by water quality parameters
9. How does the affect of water quality parameters differ in year 2011 and 2012?
10. Which water quality parameter is marjorly affecting Indian states?

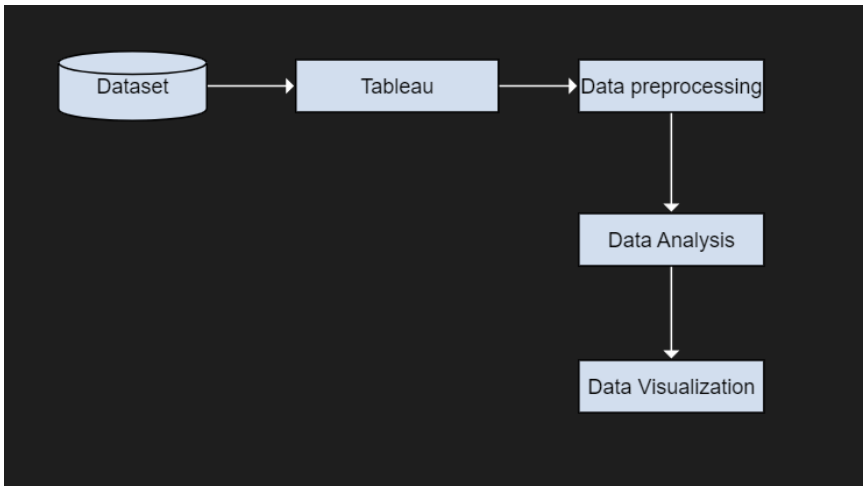
POSSIBLE SOLUTION:

Using tableau we can analyse and visualize data. We can import the dataset into tableau, preprocess data, analyse data and create beautiful interactive charts. A picture worths thousand words. We can perform simple opertations to answer the queries.

Tool used : Tableau – to create interactive dashboards and story board

Operations performed: SUMcount, total percentage, Rank, sorting- ascending order , filtering top 10

BLOCK DIAGRAM:

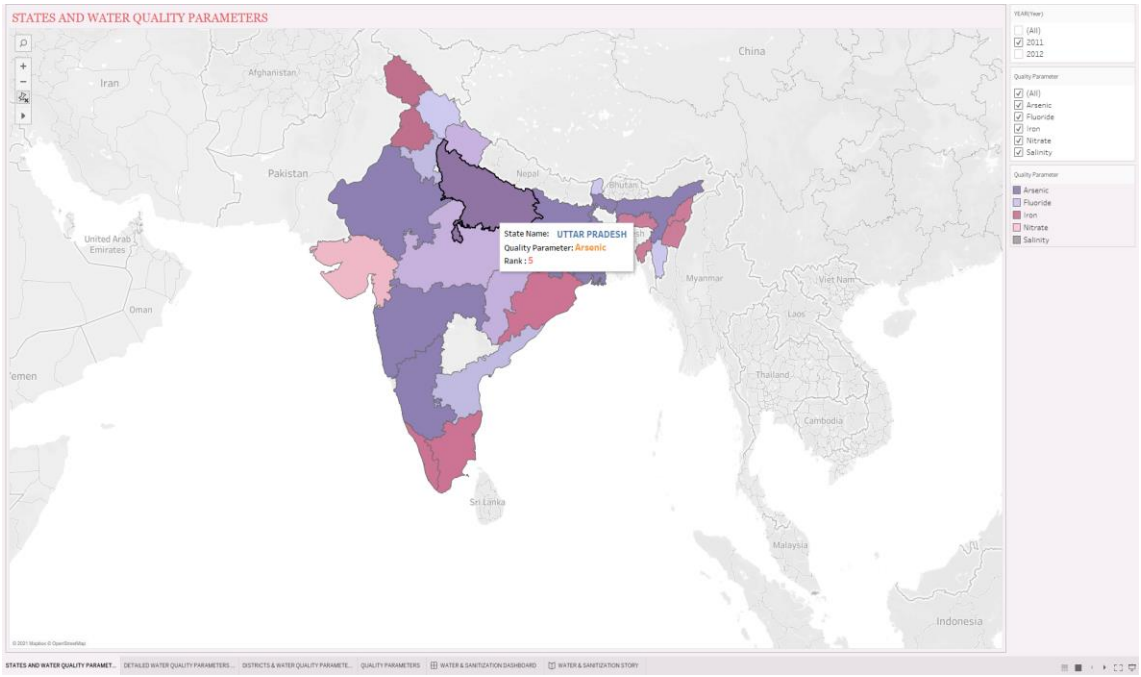


Water quality affected habitations dataset is loaded into tableau. Data is preprocessed by checking for missing values, format errors. Data is analysised and understood. Data visualization is done by creating different charts like horizontal bar graphs, bubble chart and map chart. Interactive dashboard and story board are created for quick summary of data visualization.

SCREENSHOTS:

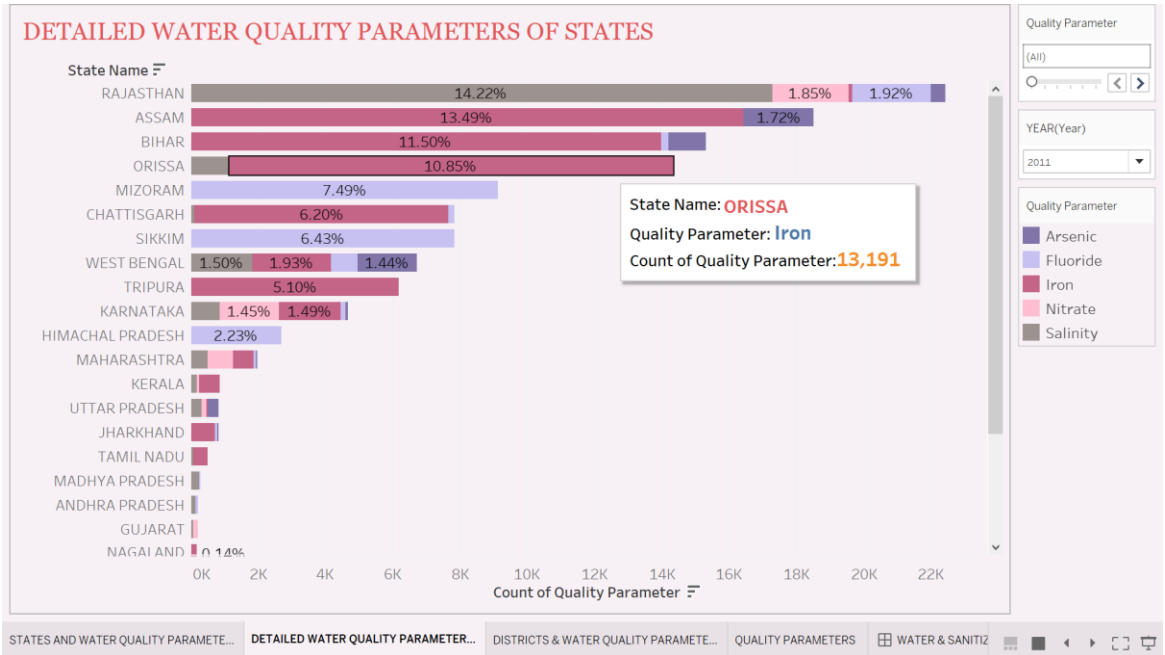
MAP CHART- States and water quality parameters:

Map based on Longitude (generated) and Latitude (generated). Color shows details about Quality Parameter. Details are shown for State Name. The data is filtered on Year - Year, which keeps 2011. The view is filtered on Quality Parameter, which keeps Arsenic, Fluoride, Iron, Nitrate and Salinity.



Horizontal bar graph- Detailed water quality parameters of states

Count of Quality Parameter for each State Name. Colour shows details about Quality Parameter. The marks are labelled by % of Total Count of Parameter. The data is filtered on Year Year, which keeps 2011. The view is filtered on Quality Parameter, which keeps Arsenic, Fluoride, Iron, Nitrate and Salinity.



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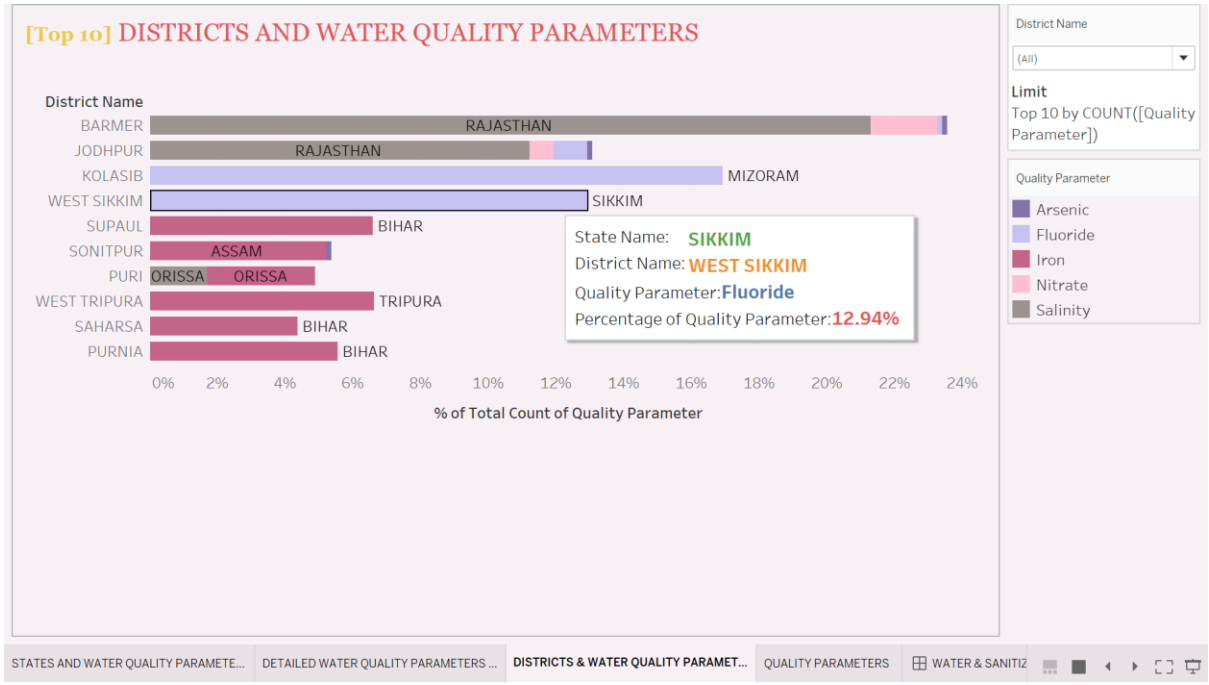
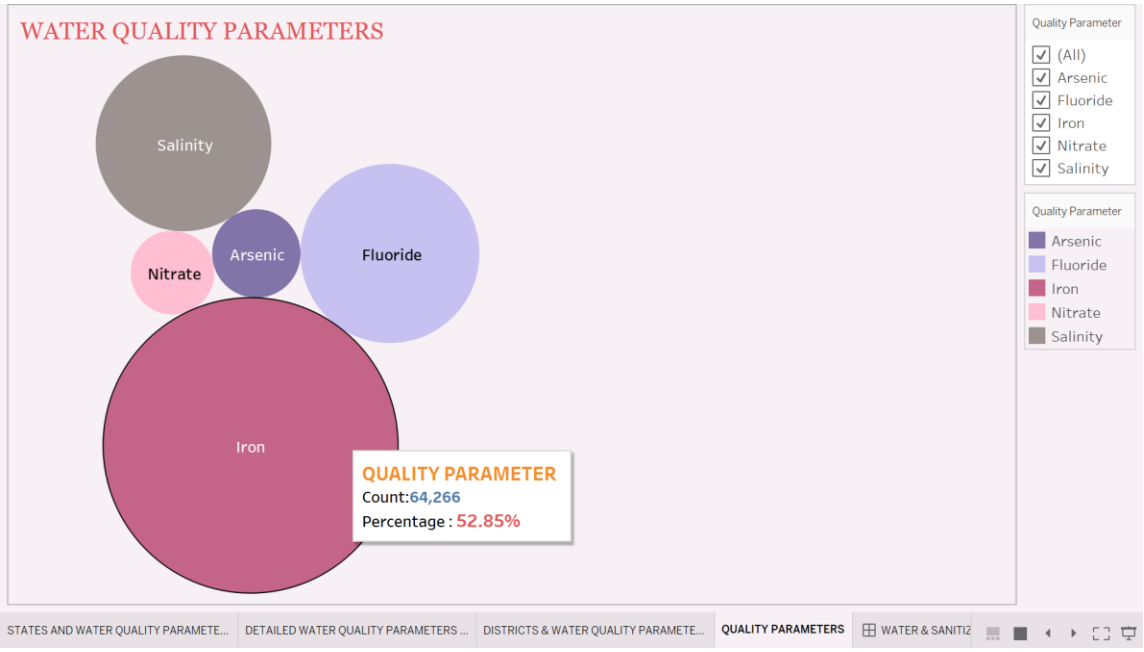
Horizontal bar graph – Top 10 districts and water quality parameters:

Percentage of Total Count of Quality Parameter for each District Name. Colourshows details about Quality Parameter. The marks are labelled by State Name. The data is filtered on Year Year, which keeps 2011. The view is filtered on District Name and Quality Parameter. The District Name filter keeps 10 of 383 members. The Quality Parameter filter keeps Arsenic, Fluoride, Iron, Nitrate and Salinity.



Bubble sort – water quality parameters:

Quality Parameter. Colour shows details about Quality Parameter. Size shows % of Total Count of Quality Parameter. The marks are labelled by Quality Parameter. The data is filteredon Year Year, which keeps 2011. The view is filtered on Quality Parameter, which keeps Arsenic, Fluoride, Iron, Nitrate and Salinity.



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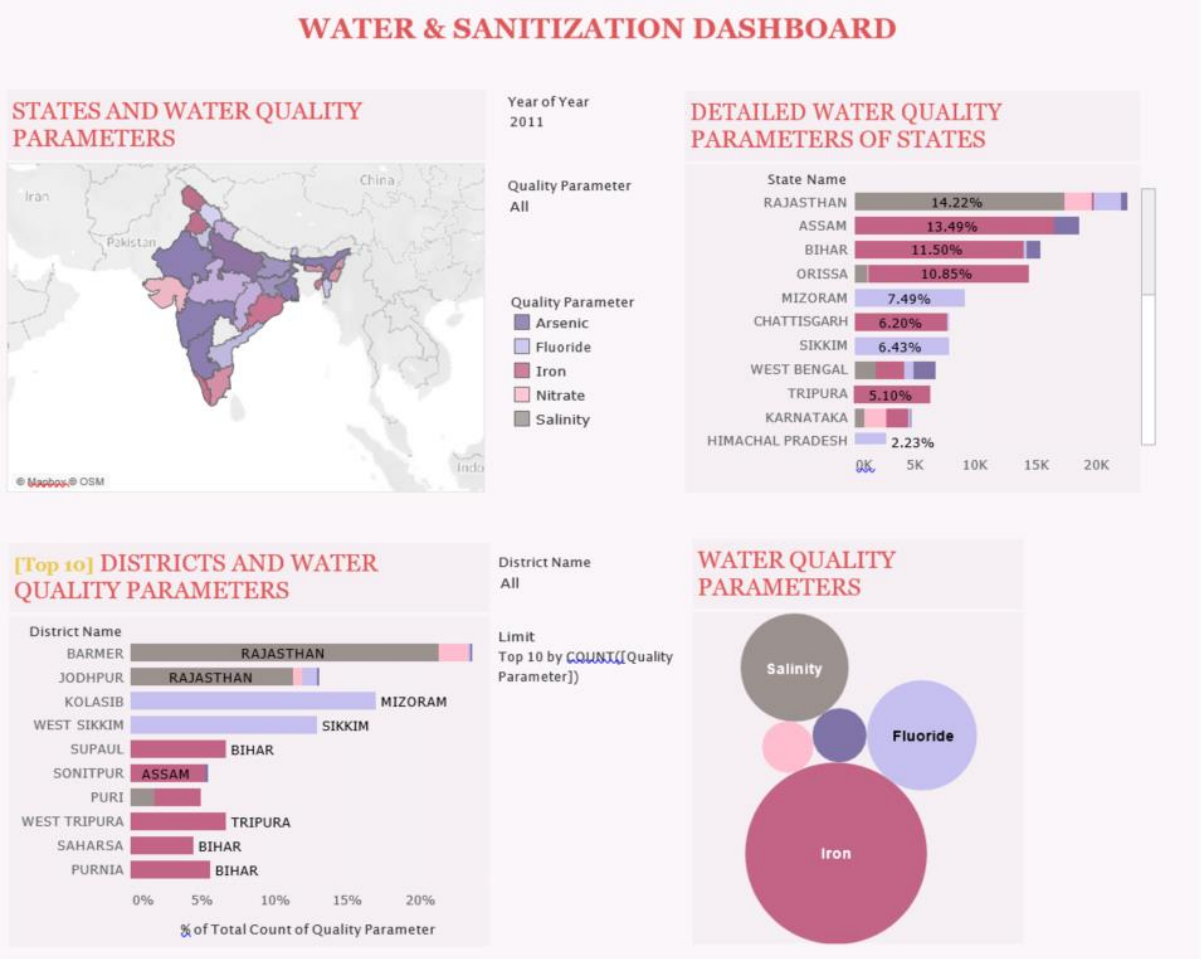
DASHBOARD:



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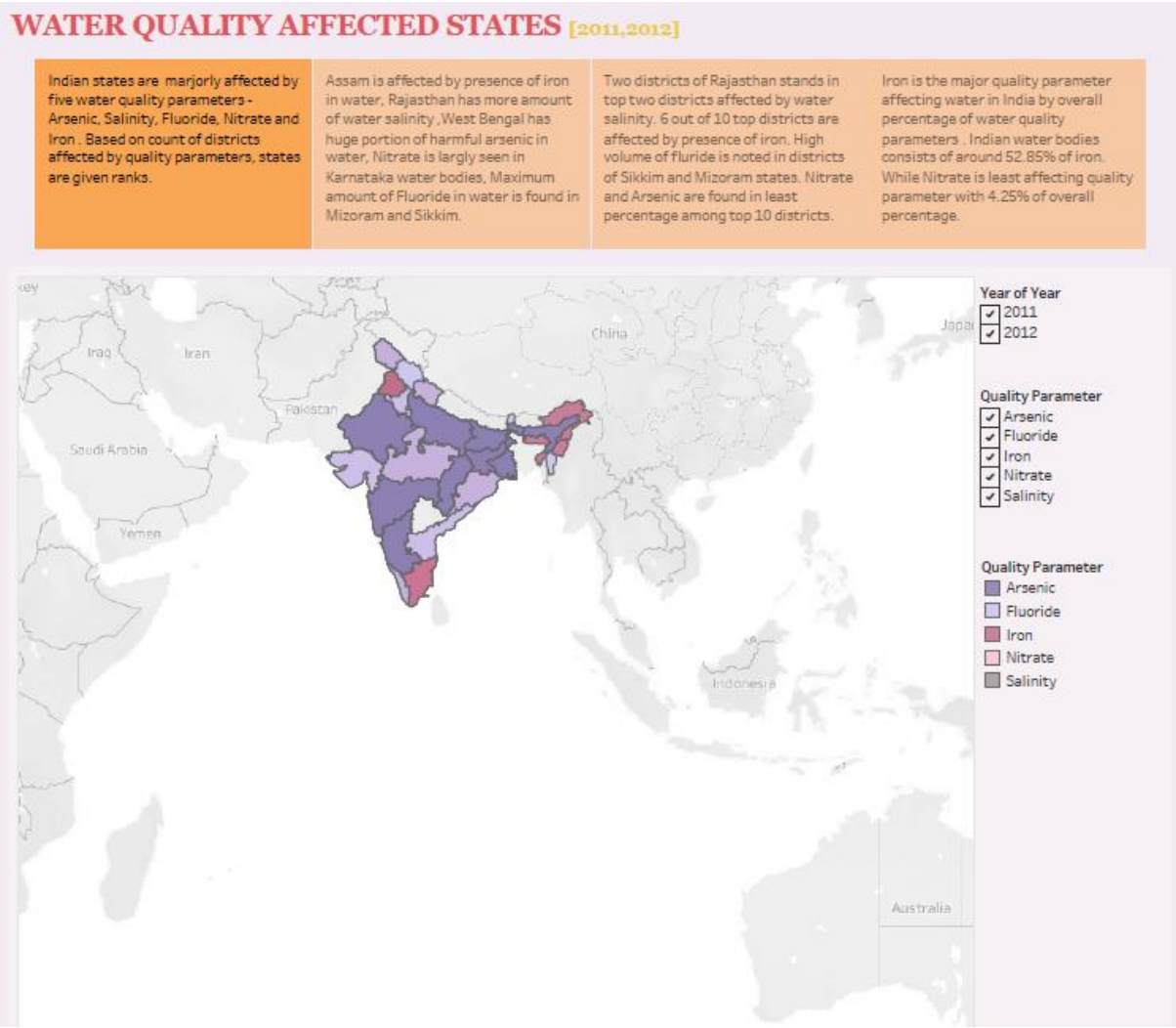
STORY BOARD:



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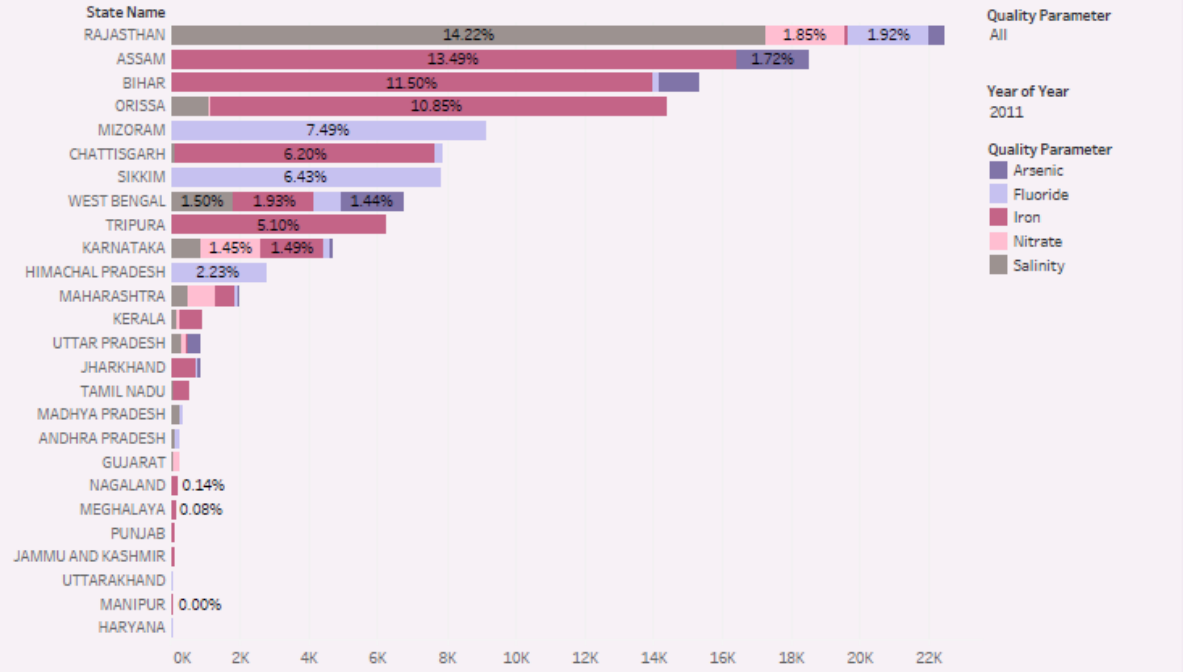
WATER QUALITY AFFECTED STATES [2011,2012]

Indian states are marjorly affected by five water quality parameters - Arsenic, Salinity, Fluoride, Nitrate and Iron . Based on count of districts affected by quality parameters, states are given ranks.

Assam is affected by presence of iron in water, Rajasthan has more amount of water salinity .West Bengal has huge portion of harmful arsenic in water, Nitrate is largly seen in Karnataka water bodies, Maximum amount of Fluoride in water is found in Mizoram and Sikkim.

Two districts of Rajasthan stands in top two districts affected by water salinity. 6 out of 10 top districts are affected by presence of iron. High volume of fluride is noted in districts of Sikkim and Mizoram states. Nitrate and Arsenic are found in least percentage among top 10 districts.

Iron is the major quality parameter affecting water in India by overall percentage of water quality parameters . Indian water bodies consists of around 52.85% of iron. While Nitrate is least affecting quality parameter with 4.25% of overall percentage.



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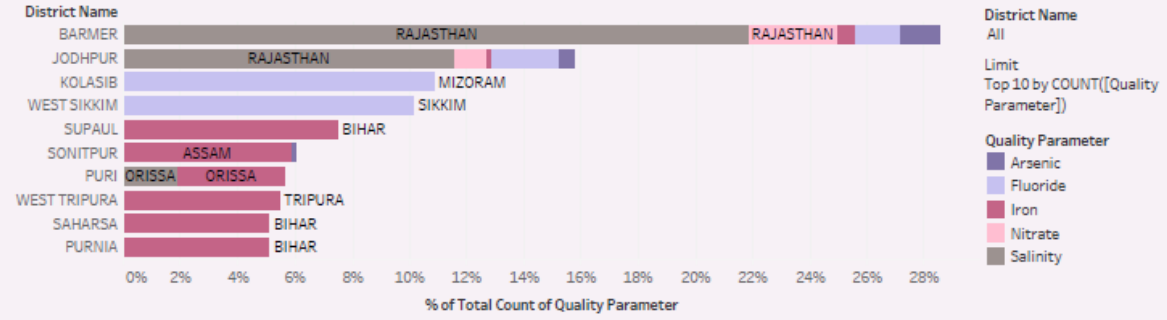

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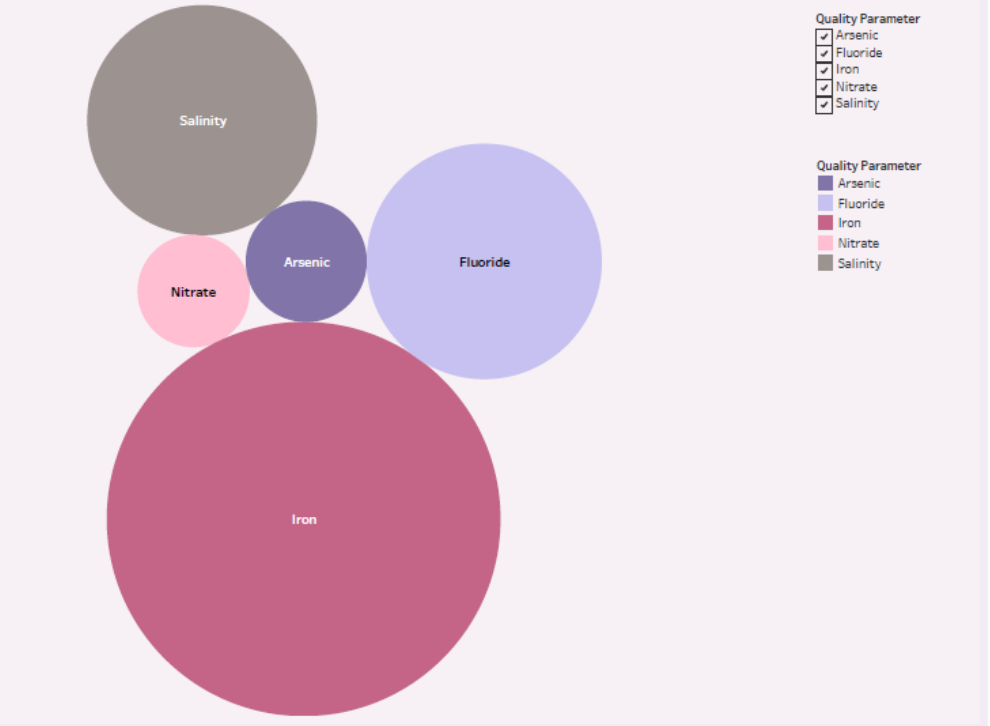

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Conclusion:

Indian states are majorly affected by five water quality parameters - Arsenic, Salinity, Fluoride, Nitrate and Iron . Based on count of districts affected by quality parameters, states are given ranks. Assam is affected by presence of iron in water, Rajasthan has more amount of water salinity ,West Bengal has huge portion of harmful arsenic in water, Nitrate is largely seen in Karnataka water bodies, Maximum amount of Fluoride in water is found in Mizoram and Sikkim. Two districts of Rajasthan stands in top two districts affected by water salinity. 6 out of 10 top districts are affected by presence of iron. High volume of fluoride is noted in districts of Sikkim and Mizoram states. Nitrate and Arsenic are found in least percentage among top 10 districts. Iron is the major quality parameter affecting water in India by overall percentage of water quality parameters . Indian water bodies consists of around 52.85% of iron. While Arsenic is least affecting quality parameter with 4.25% of overall percentage. Six states from the dataset are being affected by the presence of iron. drinking-water supplies, iron(II) salts are unstable and are precipitated as insoluble iron(III) hydroxide, which settles out as a rust-coloured silt. Iron also promotes undesirable bacterial growth ("iron bacteria") within a waterworks and distribution system, resulting in the deposition of a slimy coating on the piping. Drinking water with more iron contain regularly causes health issues. It is very important to affected states to follow the Do's and Don'ts listed by the WHO and prevent further water pollution. Every state need to preserve water and must prevent water bodies from getting more polluted. The harmful substances disposal into water is the root cause of the increase in water pollutants which are affecting the quality of water in Indian states. The reduction of disposal of wastes into water resources must get initiated in every single house. Each and every person must try their best to safeguard the water resources. To a better and safe health it is advised to consume water after filtering or slightly warming.

TABLEAU PUBLIC LINK:

Story board:

https://public.tableau.com/profile/j.sowmyasree#!/vizhome/waterquaityparameters_storyboard/WATERSANITIZATIONSTORY?publish=yes

Dashboard:

https://public.tableau.com/profile/j.sowmyasree#!/vizhome/waterquaityparameters_dashboard/WATERSANITIZATIONDASHBOARD?publish=yes

VIDEO LINK:

https://www.youtube.com/watch?v=Zd-70OyHtZ8

GITHUB LINK:

https://github.com/smartinternz02/SPS-9447-Water-Sanitization