

Information Visualization Project Report

based on

Visualizing Sex Ratio in India

submitted by

Name of Student	Roll Number
Geet Agarwal	17ucs059
Harshita Nagpal	17ucs065
Princy Garg	17ucs114

Data Set

We chose the dataset for [Statewise Sex Ratio in India](#). The categories we have are Urban population, Rural population, and Total population. Data from 2011 is the latest publicly available on sex ratios of Indian cities. We used the dataset from data.gov.in.

Problem Statement

We want to address the problem statement “Has the sex ratio gotten worse in India?” by comparing data from the years 2001 and 2011. This ratio is not 1,000 boys for every 1,000 girls because it is nature’s way of balancing a higher risk of death for boys as they grow older.

Our Visualization

Data visualization helps to tell stories by curating data into a form easier to understand, highlighting the trends and outliers. A good visualization tells a story, removing the noise from data, and highlighting the useful information.

According to our geospatial dataset, we chose geospatial information visualization as they are useful when comparing two or more datasets, and they can be analyzed to see trends or patterns.

There are countless ways to visualize geospatial information. For thousands of years, humankind has used maps to understand the environment and find our way home. Today, there are many visual methods for depicting real, simulated, or fictional geospatial ‘worlds’.

Geospatial Data Visualization is an effort to represent the importance of location data by providing visual context. Verbal skills are not enough to present geographic information and hence graphical skills are required to understand trends, patterns, correlations to help draw conclusions.

Here are the Geospatial Data Visualization maps that we visualized:

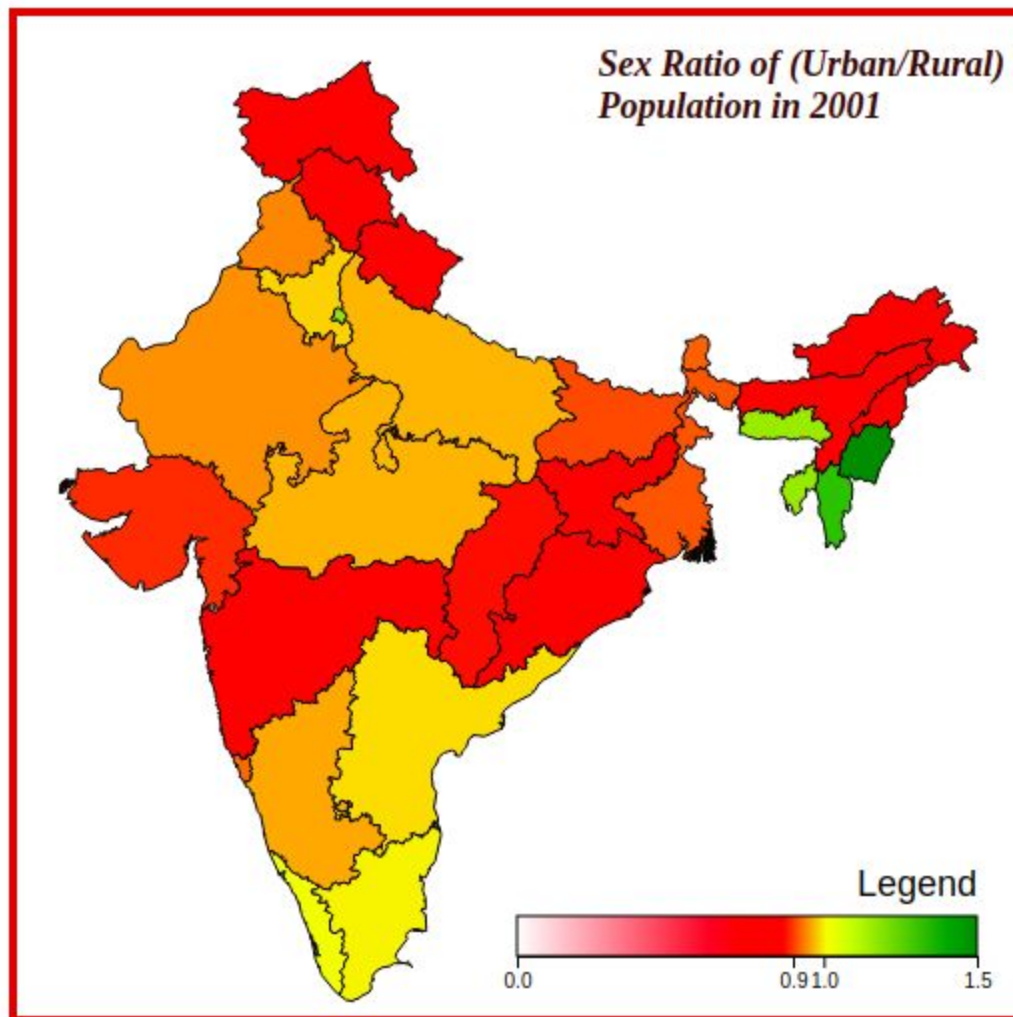


Fig. 1. This map of India shows the Urban by Rural Sex Ratio of the Population of India as per 2001.

We can observe the most states are colored red and orange depicting a ratio between 0.8-1.0. Only a few states have green color (mostly North Eastern states) showing a much higher sex ratio in urban parts than the rural parts of the state.

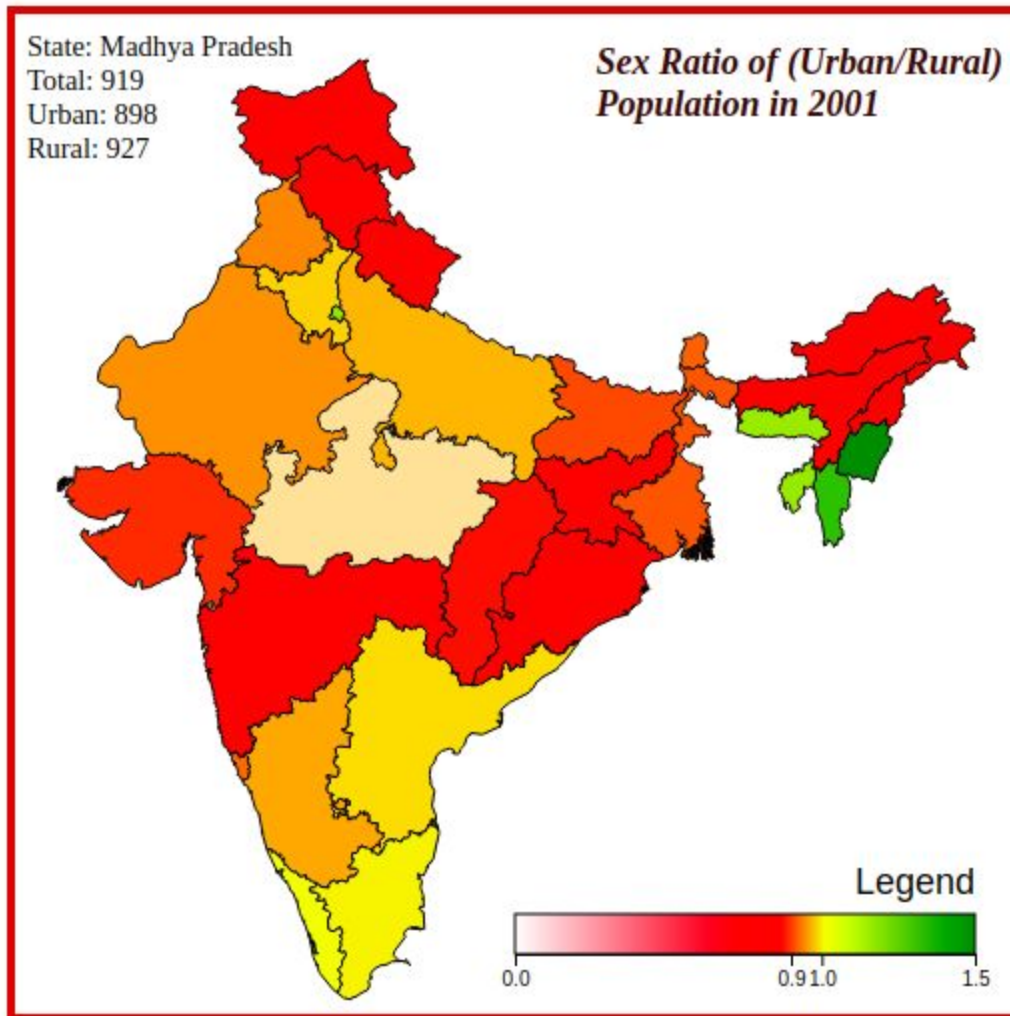


Fig. 2. To make the maps interactive, we enabled a feature that highlights the state you hover on and tells more details about that state like the name of the state, the actual statistics of the sex ratios, etc, in all the maps.

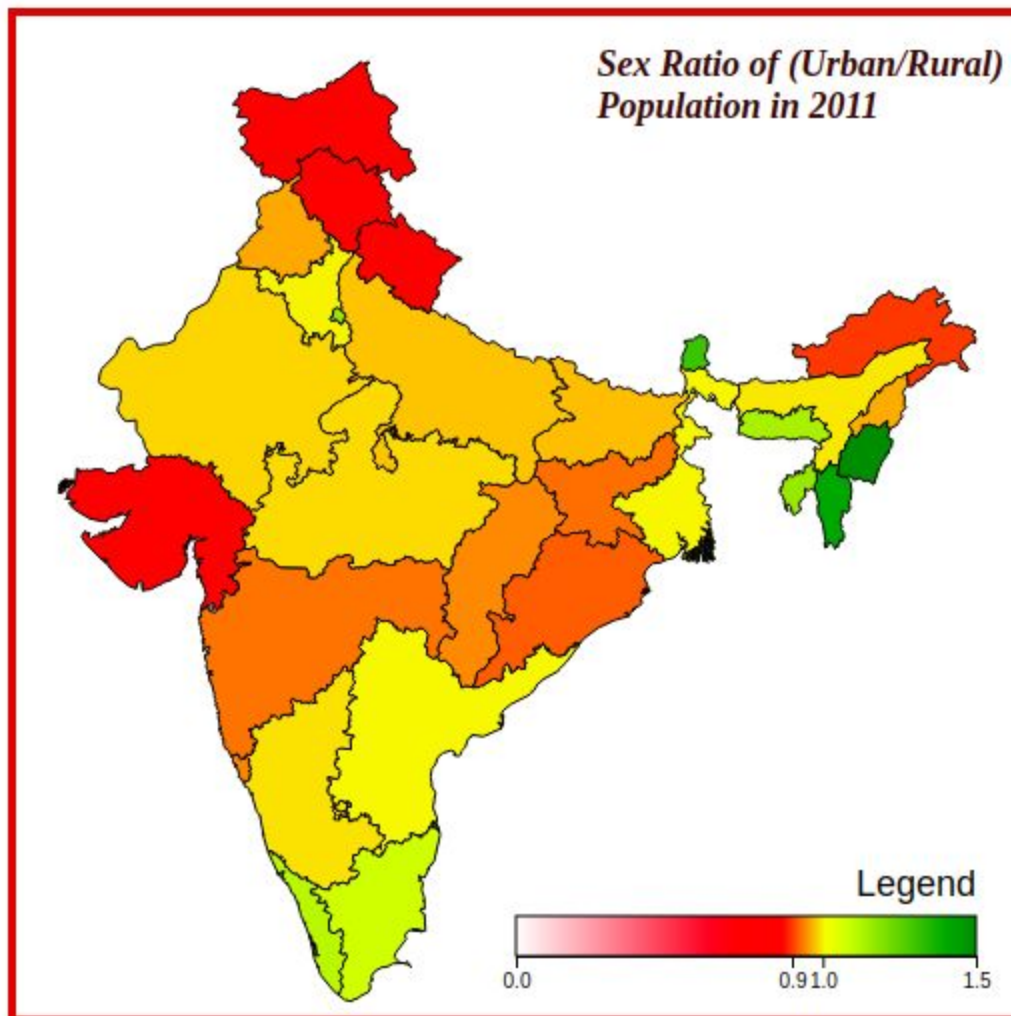


Fig.3. This map of India shows the Urban by Rural Sex Ratio of the Population of India as per 2011.

We can observe that now most states aren't colored red anymore and most of them have inclined towards a yellow or orange shade, to a ratio very near 1.0, depicting that the Rural and Urban sex ratios have become almost equal overtime for most states.

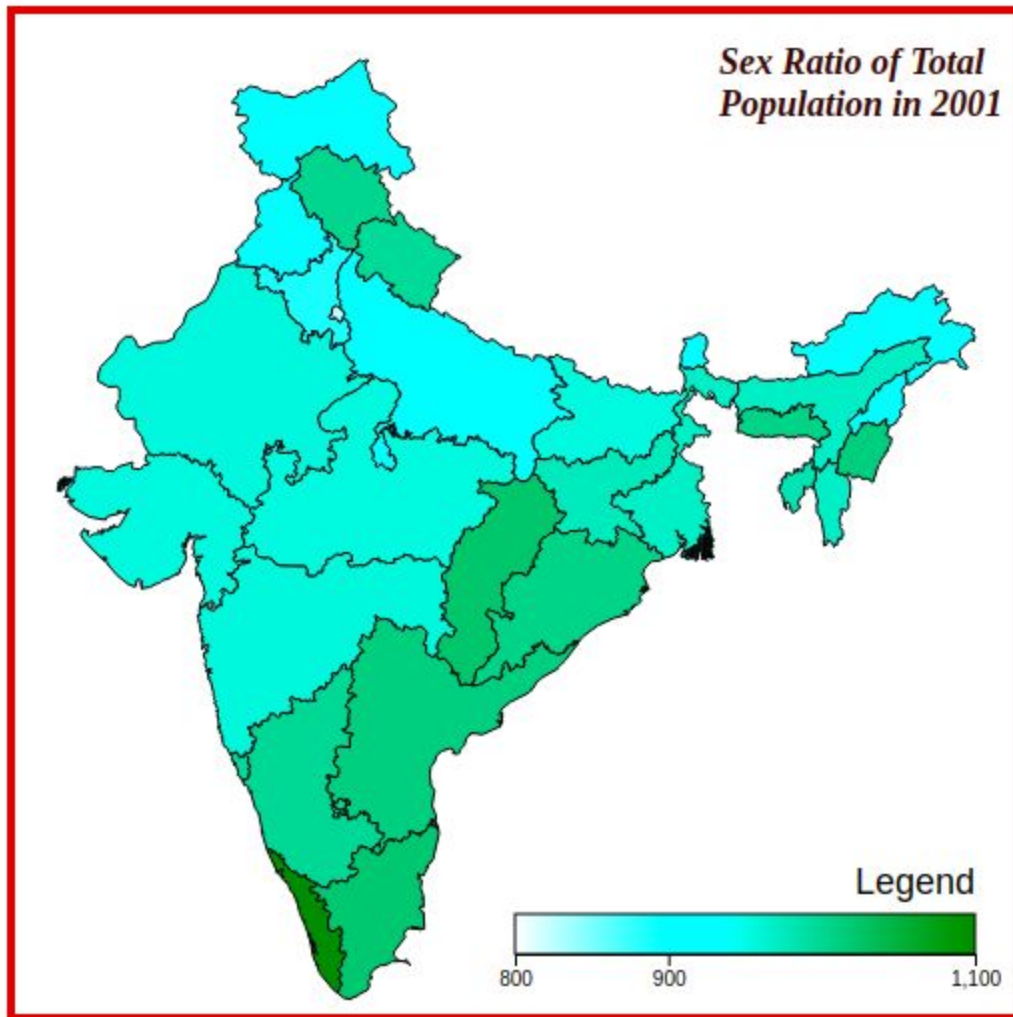


Fig.4. This map denotes the Total Population's Sex Ratio in the year 2001. We can observe that the ratio mostly lies between 900 to 1000 in most states which denotes that there are generally 900-980 females per 1000 males there. Kerala has the greenest, and impressive sex ratio with a ratio around 1100.

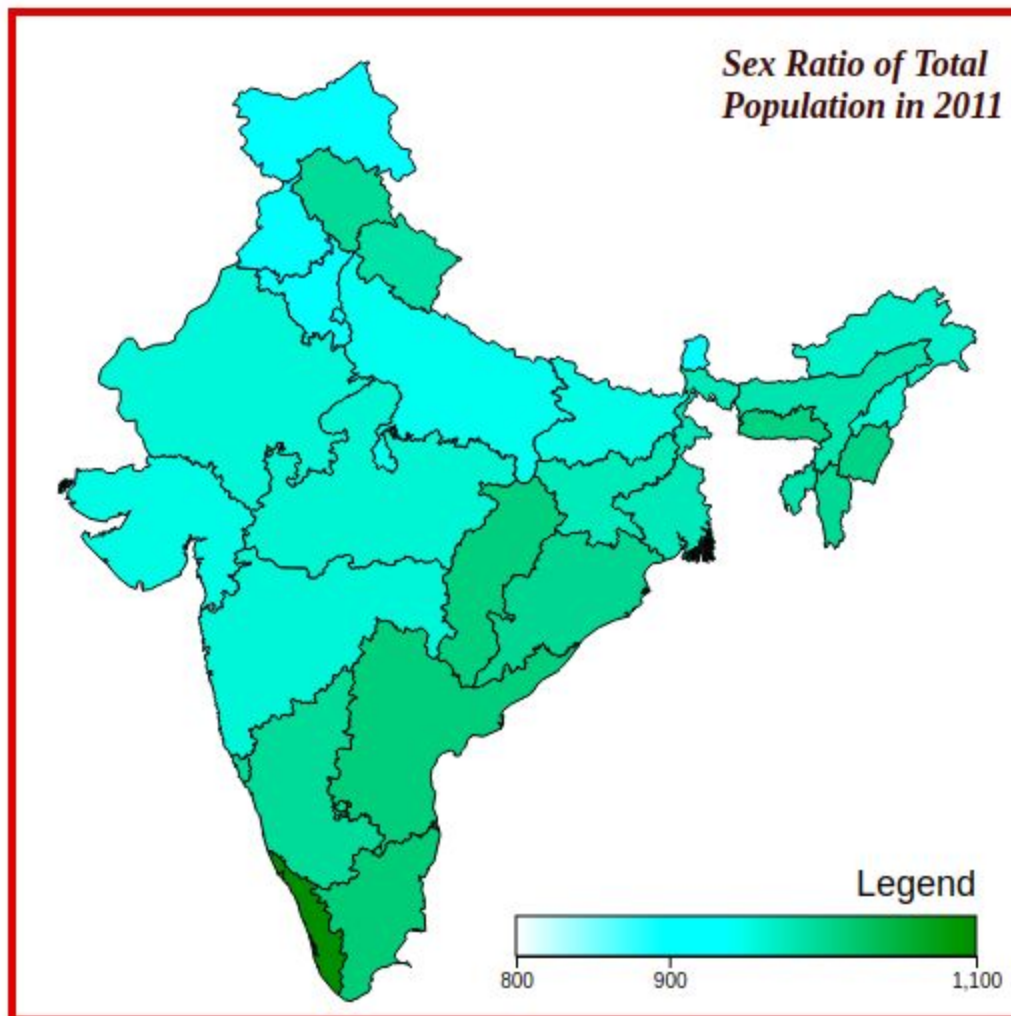


Fig.5. This map denotes the Total Population's Sex Ratio in the year 2011. We can observe that over the years the green color faded and thus, the number of females per thousand males has decreased over time. Kerala, however, still holds a very high ratio as compared to others.

Strengths

We made our visualization interactive as it focuses on improving the way we interact with information. Interactions provide an easy way to understand insights that may be based on rapidly changing data. They are able to show a real relation between data input and visual output.

We get the ability to visualize location related information easily and improve insights to foster decisions. We get an improved ability to convey information to the audience that

they can understand. We get more accessible and understandable information without the need for verbal explanation. It provides an increased ability to act on observations, therefore, achieve success with greater agility. Spatial visualizations are also effective when exploring meaningful questions. Furthermore, spatial visualizations can show exceptions to the general trend.

We have included annotations such as labels, legends, axes, titles, guides, and keys to help a visualization communicate effectively.

We have also used semantical meaning for our diverging color gradient to indicate **green** for a better sex ratio and **red** for a worse one. This makes it more intuitive to understand.

Weaknesses

Our spatial visualization does not provide reasons for certain trends or exceptions to the trend. There is room for improvement in interactivity for zooming etc.

We could have grouped data of different states together to provide better visualization.

Conclusion

Some of the largest cities in India – including Delhi and Mumbai – had more imbalanced sex ratios in 2011 than rural areas. Contrary to the popular perception that the deeply rooted prejudice against girls, reflected in the country's sex ratio, is mostly present in rural areas, some of the largest cities in India – including Delhi and Mumbai – had imbalanced sex ratios in 2011, according to visual analysis.

Acknowledgments

We would like to express our sincere gratitude towards **Dr. Subrat Dash**, for his patient guidance, enthusiastic encouragement, and useful critiques on this project. Without his invaluable guidance, this work would never have been a successful one. We would also like to thank all our B.Tech classmates and friends for granting their unconditional support and help, whenever we needed it.

Bibliography

The following resources were utilized for completing this project.

- Vizhub for practicing coding in d3
- Interaction design foundation for general designing principles and rules
- Coursera for video lectures of the specialization in information visualization
- Data.gov.in for exploring datasets