Analysis of Household Consumption & Expenditure Patterns in Rural and Urban India (2022-23)

Methods used, Insights derived, and Visualization strategies employed.

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1. Introduction

The **Household Consumption Expenditure Survey (HCES) 2022-23** provides an understanding of rural and urban household behaviour in India. Policymakers need to understand these trends in order to design efficient social and economic programs. This report outlines the methods used to analyze the data, key insights derived from the study, and the visualization strategies employed to present the findings effectively.

2. Methods Used

2.1 Data Collection

The dataset was extracted from the **HCES 2022-23** report, which provides detailed information on **Monthly Per Capita Expenditure (MPCE)** across different fractile classes, states and social groups. The relevant tables were derived from the report using a Python script with **pdfplumber** and **Pandas** libraries. The extracted data was saved into CSV files and further **organized manually** and **cleaned using Pandas** to prepare it for visualization.

2.2 Data Cleaning and Processing

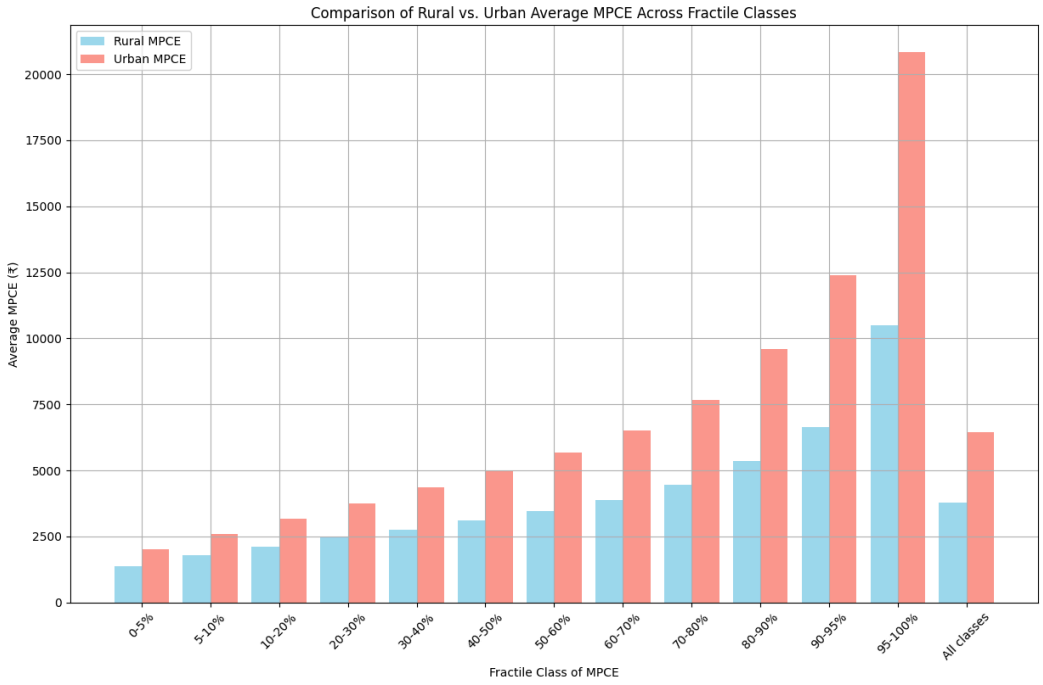
- The raw data was processed using **Python (Pandas)** to convert it into structured CSV files.
- Missing or inconsistent values were handled to maintain data integrity.
- The data was further refined **manually and using Pandas** to ensure accurate classification into rural and urban segments.

2.3 Exploratory Data Analysis (EDA)

Before visualization, statistical summaries and distribution analyses were conducted to identify trends and variations in MPCE. This helped in **selecting appropriate visualization techniques.**

3. Insights Derived

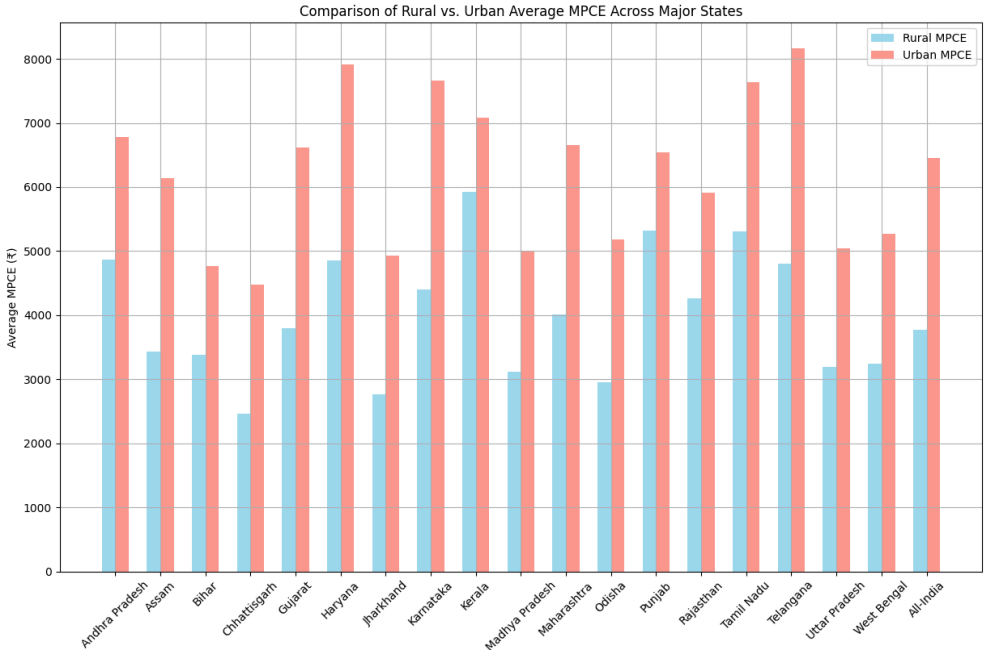
3.1 Comparison of Rural vs. Urban Average MPCE Across Fractile Classes (pg 22, table 3.1)

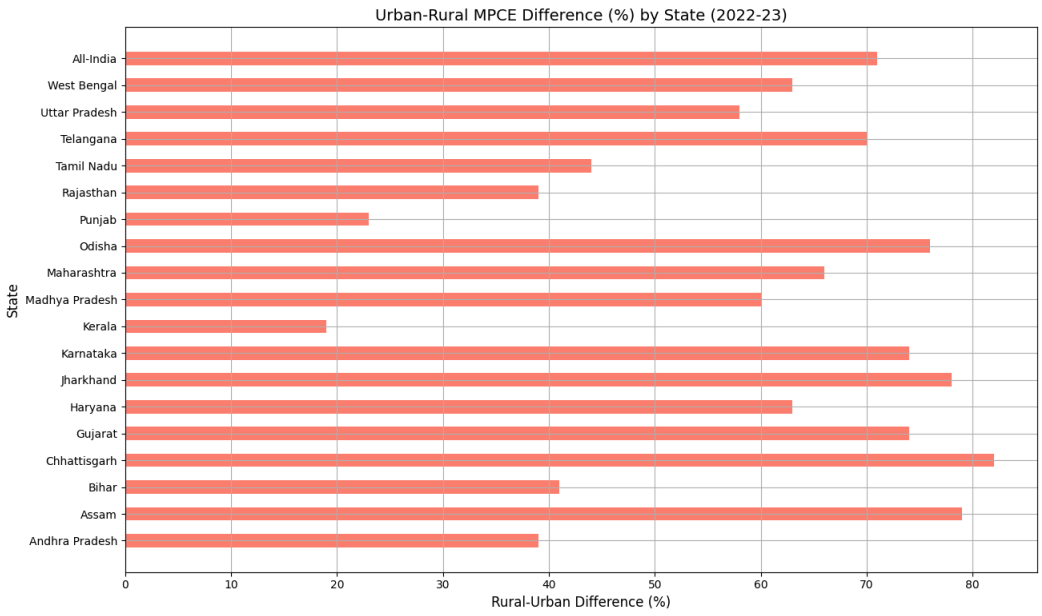


- Urban MPCE is consistently higher than Rural MPCE across all fractile classes.
- The gap widens significantly in the highest fractile class (95-100%), indicating a **higher concentration of wealth in urban areas**.

- Lower fractile classes show less disparity, suggesting that **lower-income groups** in both rural and urban areas have **similar spending capacities.**
- The steeper rise in urban MPCE at higher fractile levels suggests that **economic growth is benefiting the upper-income urban population** more significantly.

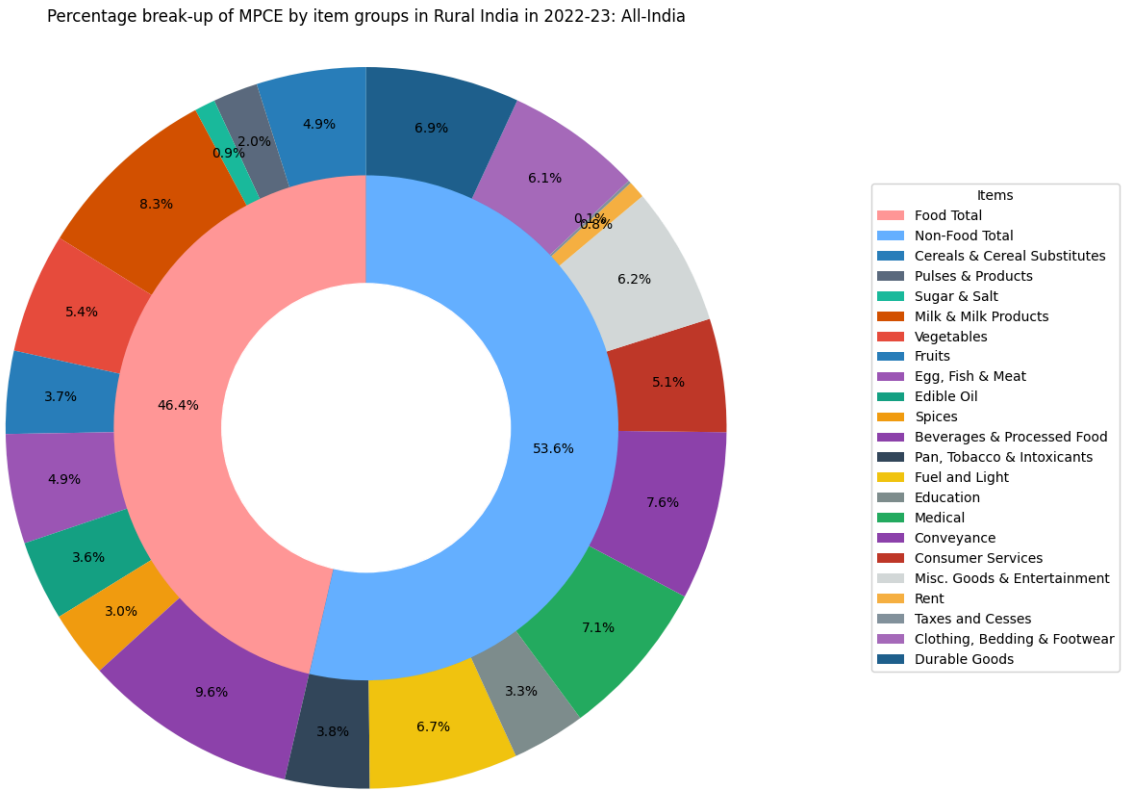
3.2 Comparison of Rural vs. Urban Average MPCE Across Major States (pg 23, table 3.2)

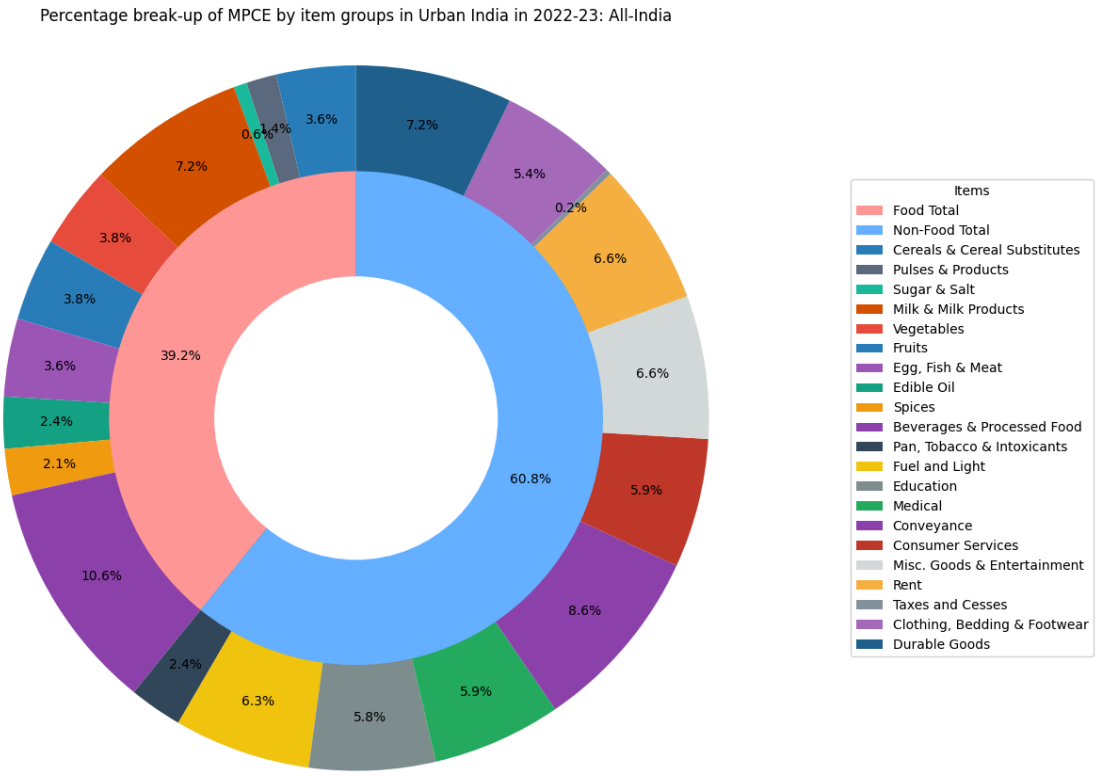




- Urban MPCE is higher than Rural MPCE in all major states, highlighting economic inequality.
- States like **Odisha, Haryana, and Gujarat**, with the highest urban-rural expenditure differences, while others like **Punjab and Kerala** have a comparatively smaller gap.
- States with higher MPCE have **better infrastructure and access to resources,** which accounts for the spending difference.
- The state-wise differences in MPCE indicate that **regional policies and economic opportunities play a key role** in expenditure patterns.

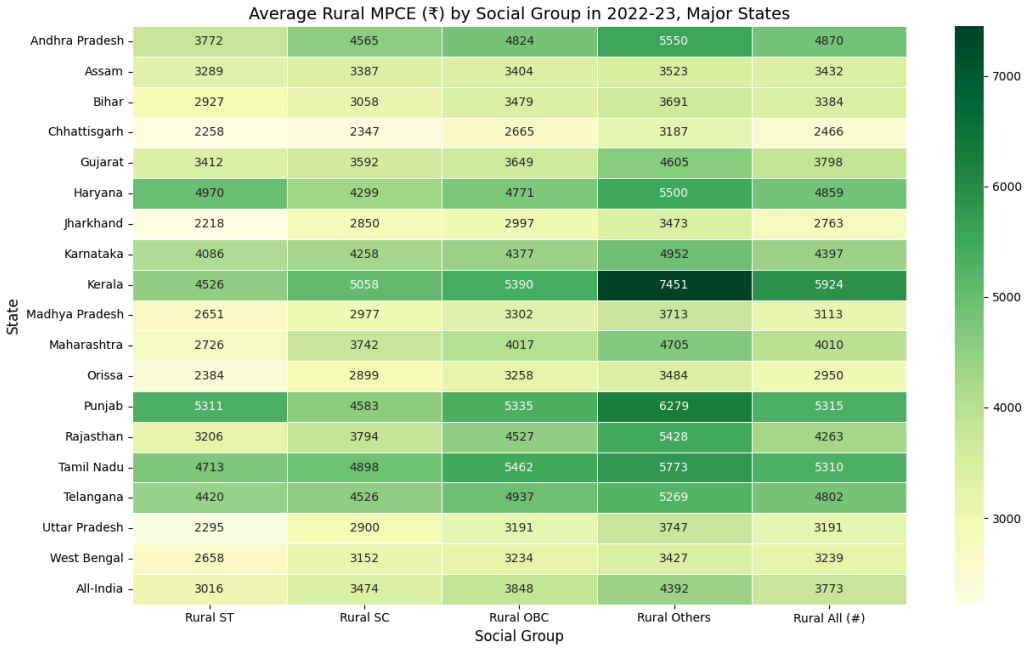
3.3 Percentage Breakup of MPCE by Item Groups in Rural & Urban India (pg 29, table 3.5)



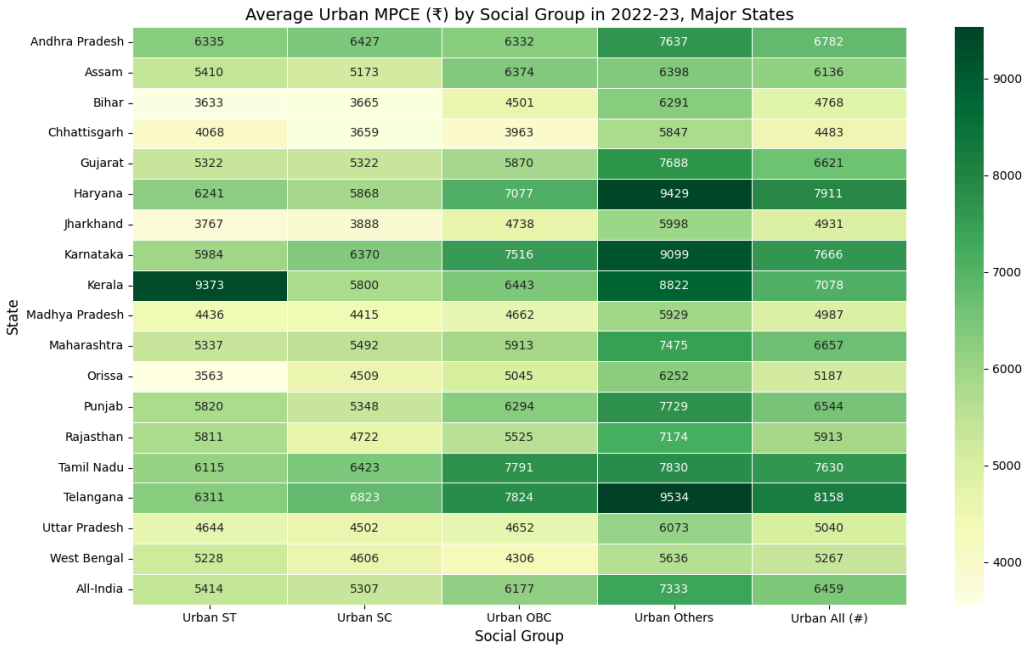


- **Food spending prevails in rural areas**, while urban families spend more **on rental purposes, transport, and other services.**
- The spending pattern reflects economic priorities - **rural households** spend more on **essentials**, while **urban households** have a **diversified spending pattern.**
- **Healthcare and education spending** is significantly higher in **urban areas**, suggesting **greater availability of these services.**
- The large differential in discretionary outlays (recreational activities, entertainment, etc.) reflects lifestyles and levels of financial freedom among rural and urban populations.

3.4 Average MPCE by Social Group Across Major States (pg 43, table 3,12)



 # includes not reporting cases (i.e., those who have not reported social group) also.



 # includes not reporting cases (i.e., those who have not reported social group) also.

- The "Others" category has the highest MPCE, while **SC and ST groups have the lowest expenditure levels.**
- Urban households in all social groups have higher MPCE than their rural counterparts, but the spending gap varies by state.
- States with a **higher proportion of disadvantaged groups** tend to have lower MPCE, reinforcing the need for targeted policies.
- The **role of affirmative action policies and social welfare schemes** is evident in states where SC/ST MPCE shows improvement.

4. Visualization Strategies Employed

The visualizations were created using **Matplotlib and Seaborn** libraries in Python, ensuring clarity and accuracy in data representation.

4.1 Bar Graphs & Horizontal Bar Graphs

- **Bar graphs** were used for **comparisons across fractile classes and state-wise Average MPCE differences between rural and urban areas**.
- **Horizontal bar graphs** were used to visualize the **Urban-Rural MPCE percentage difference by state**, making it easier to compare variations across states.

4.2 Nested Pie Charts

- Used to **highlight percentage breakup of MPCE by item groups in Rural and Urban India.**
- Color-coded representation helped identify the items and the inner pie-chart helped to differentiate between food and non-food items.

4.3 Heatmaps

- Used to **highlight variations in Average MPCE across states and social categories**.
- Color-coded representation helped identify high and low expenditure regions easily.

5. Conclusion

The analysis effectively demonstrates how household **spending patterns differ between rural and urban India**. The visualizations **simplify complex datasets**, allowing for **better**

interpretation of economic disparities, social group-wise trends, and state-wise variations. These insights are significant to policymakers to develop **targeted welfare policies, refine subsidy distribution, and induce inclusive economic growth.**

This systematic method of data visualization **guarantees that critical findings are available, usable, and contribute effectively** towards informed decision-making.