

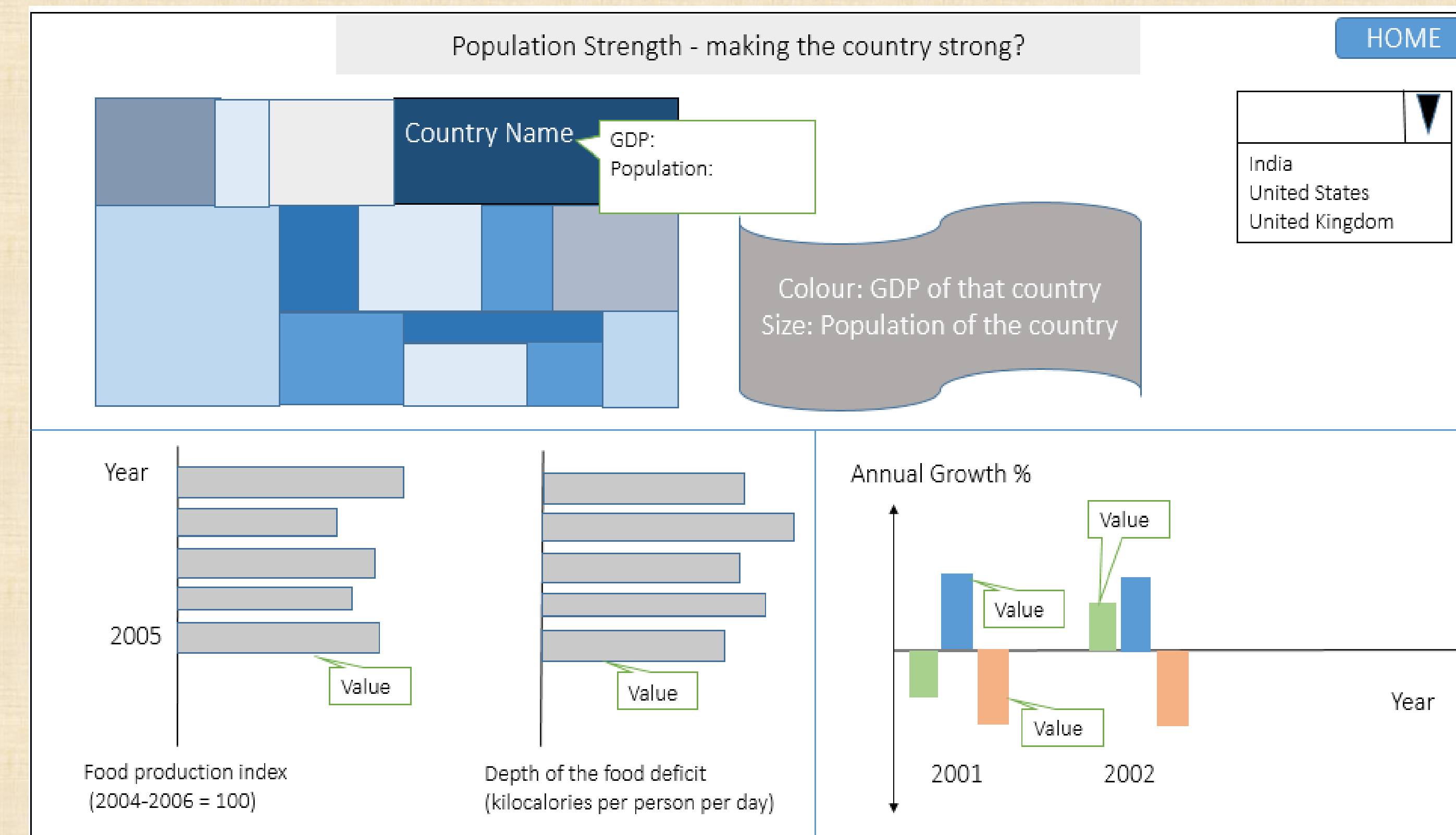
A Decade of Development?

A visualization system to help reflect over the past decade while raising questions about world development and its effects

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Motivation

- **To see if having a higher GDP actually symbolizes a developing world**
- **Issue:** Development of countries
- **Goal:** To visualize the development of countries and its impact on the environment
- **Requirement:** Tools for analysis of development patterns and key differences between countries over time
- **Idea:** Pictures speak louder than words, it is always easier to understand something if we can see it. Though a lot of data is available on this subject, it is not easy to look at this data and understand everything necessary to make decisions
- **Challenge:** To take the data that is out there, and create effective visualizations, so as to facilitate the understanding of world development



What we chose?

Animation of Scatterplots changing over time

Why we chose it?

- We needed something to highlight the primary aspects of our data: GDP, population and CO2 emissions.
- To show variation in all 3 factors over time without using a 3-D graph, we encoded the CO2 values as the size of circles on the scatterplot
- The user can pre-attentively see how each country's emissions vary over time according to other 2 factors with such an animation

Discussion of Design Ideas

What we used?

Treemap (population of a country [size] and its effect on GDP [colour])

Why we chose it?

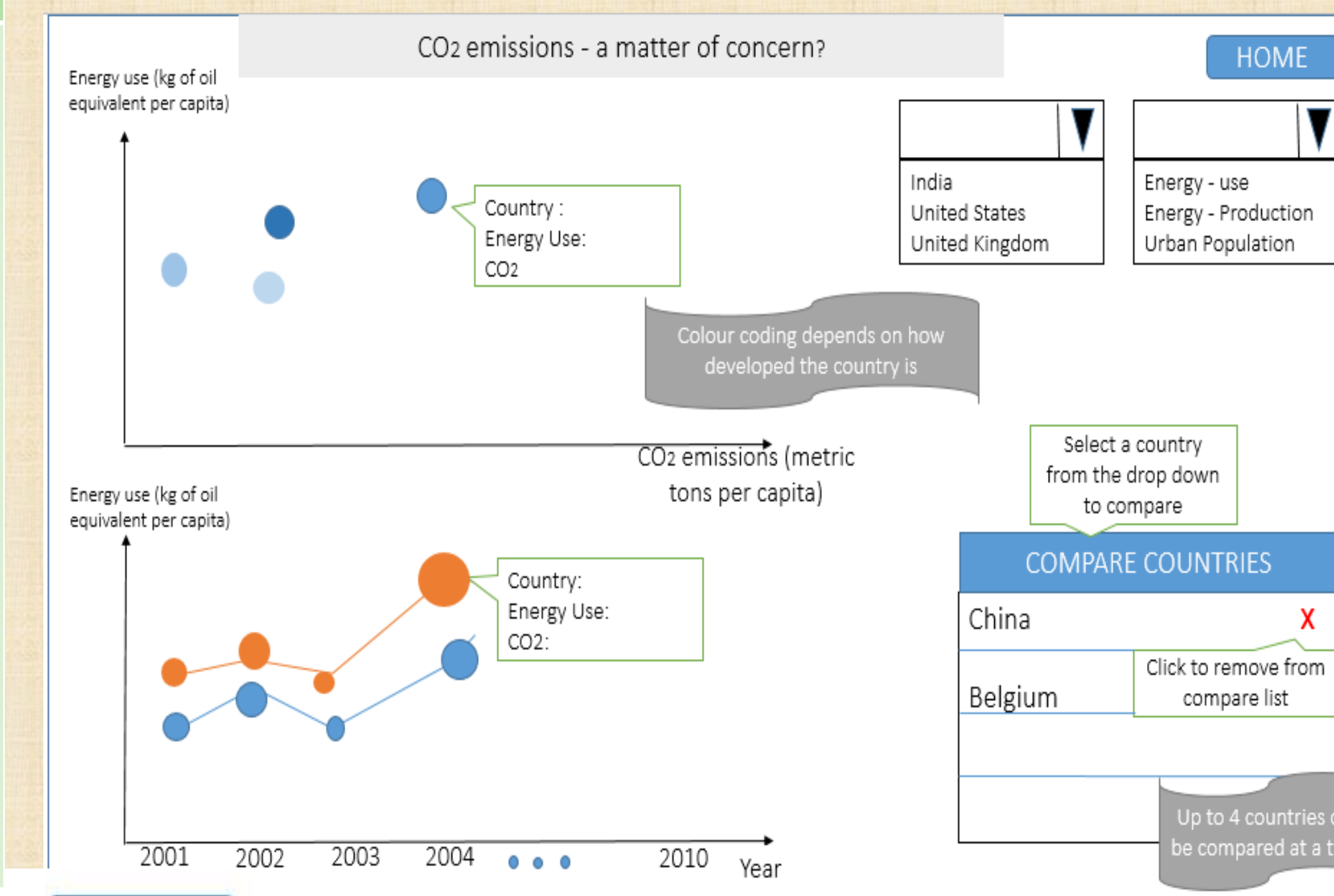
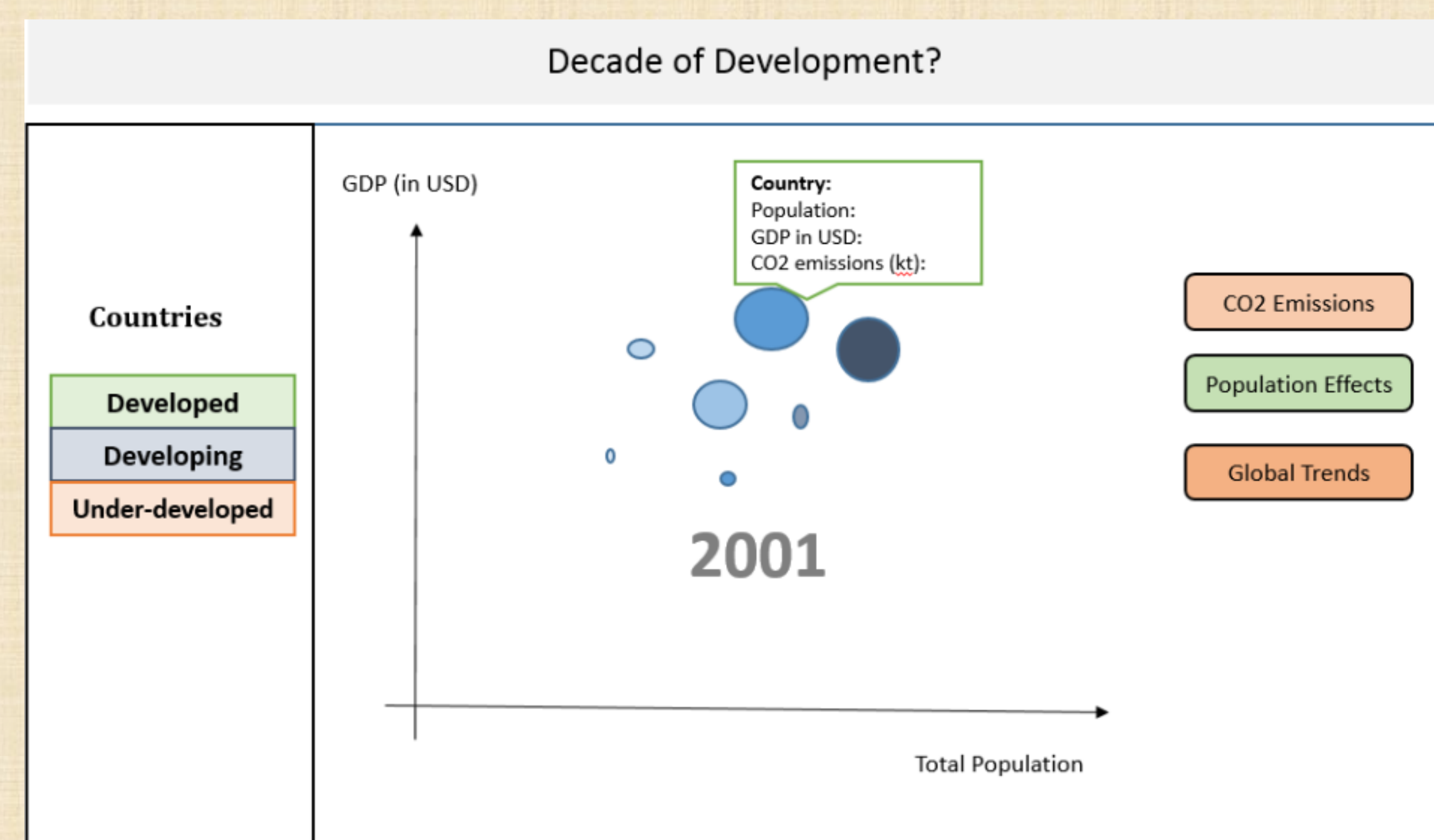
- Drawing bar graph for all countries on the same chart was not feasible.
- User's pre-attentive vision will help them identify which areas are highly populated and what their corresponding GDPs are
- Hover event shows specific data

Deviation graph

- Easy comparison of data is possible with this representation
- Negative values could be better understood if plotted downwards

Side-by-side bar charts [Crosstabs]

- Helps visualise the trend of depth of food deficit when the food production index is high.
- Arranged vertically so that data can be easily compared along the time scale too. Side-by-side representation makes comparison easy.
- We can also see if the deficit in the country is reducing over time. This helps identify potential areas of concern.



Two graphs [one below the other]

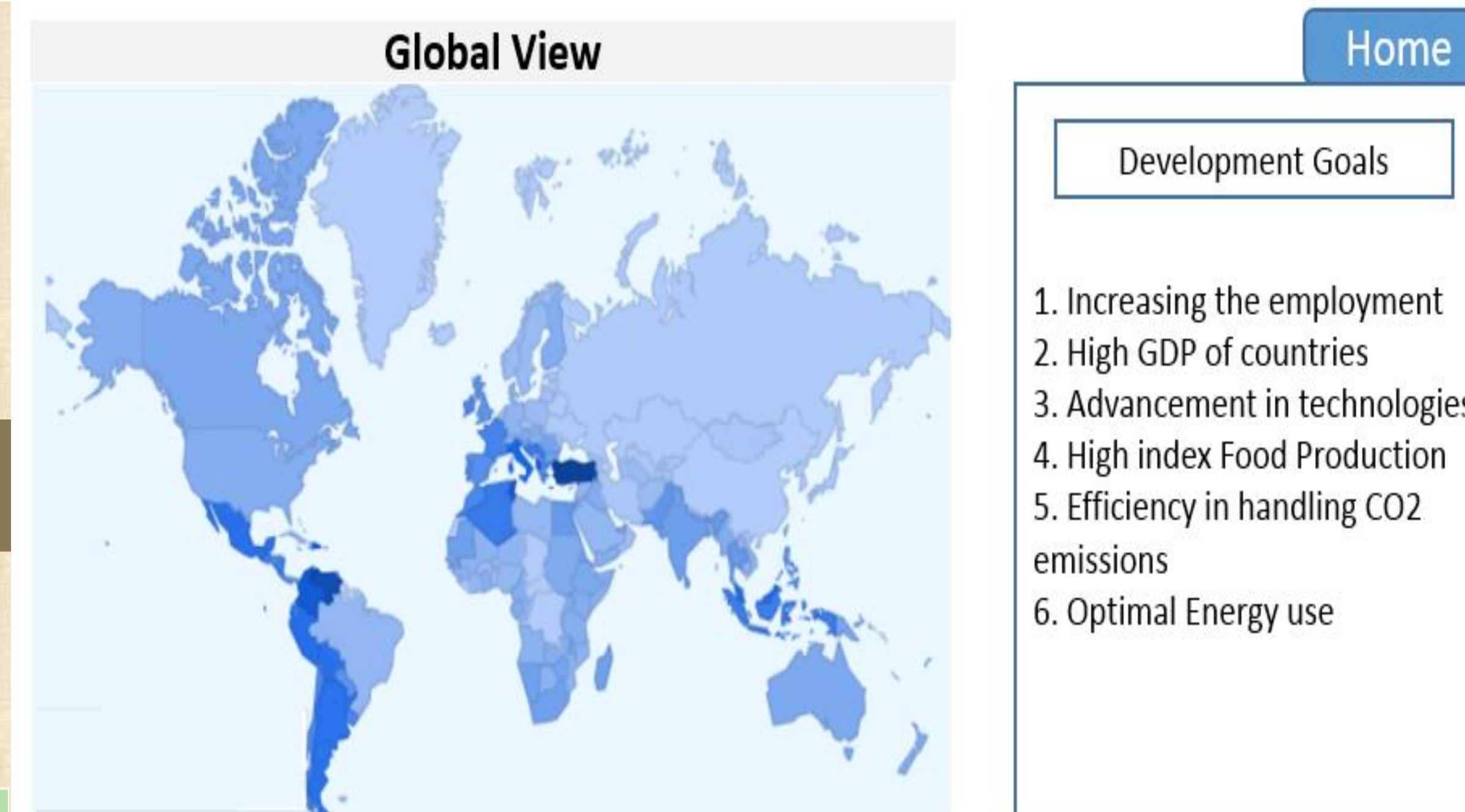
- Y-axis of both graphs can be modified in order to update the plots
- Allows both spatial and temporal analysis.
- Since comparison between countries is a key factor in understanding development, we have a provision to select up to 4 countries whose data can be compared.

Line Graph with coded circles [CO2]

- Clearly shows time series data for the selected country
- It is easy to observe the trend in such a graph

Data Processing

- No type-conversion required as all the data is numeric
- Missing values and NA data has been filtered out.
- Re-expression [changing units] of some data



What we chose?
Color Gradient Maps

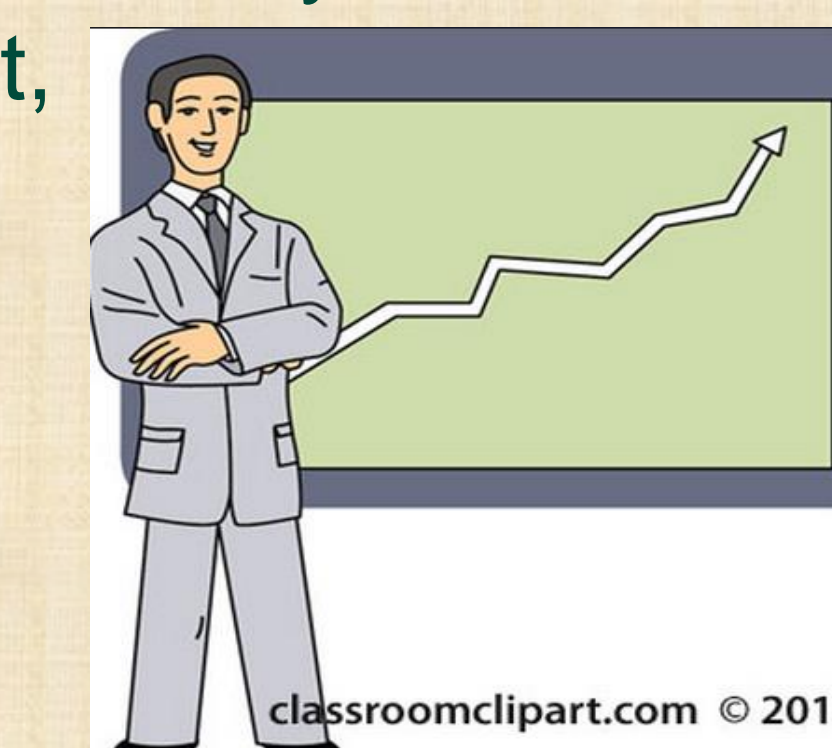
Why we chose it?

- The goal was to provide the user with a detailed comparison of all countries for each data attribute we use
- A world-map, color-coded with a gradient based on the attributes, can help a user easily compare countries
- Another option was to create a bar chart or a scatterplot, but we wanted to take advantage of a user's geographical knowledge of maps, to help him understand the trends easily

Who will use it?

Researchers:

- **Goal:** Study of population of a country, its technological advancement, or even a relation between its population and pollution level may be helped.



- **Our Tool:** Explore CO2 trends on a screen to see how energy use/production and population affects the CO2 levels in a country. Visualize data about a country's working-age population, technology use, etc. on the Global view screen
- **Use:** Could find valuable insights on the causes of alarming levels of CO2 or see the variation of levels of CO2 over time. Country comparison feature could be used to confirm some of their theories.

Journalists:

- **Goal:** Need to backup a development story with relevant research reports and effective visualisations.



- **Our Tool:** Visualise data on the Global View page or see temporal data on the cause-and-effect graphs in different sections.
- **Use:** Provides visual proof to back up their proposed arguments