AFRICA HUNGER AND FOOD INSECURITY

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1. INTRODUCTION

In recent years, due with the severity of the Covid-19 pandemic and Russia-Ukraine war, food security and hunger has been a critical issue for numerous least developed and developing countries. According to the United Nation's Committee on World Food Security [1], food insecurity is defined as the situation where people encounter hardships when attaining healthy and nutritious food for normal development. Among continents, the impacts of such problem on Africa are particularly severe, with almost 60% of the total population facing food insecurity in 2020 (Figure 2). Additionally, it deters a goal set out by the United Nation (UN) that the world is expecting zero hunger by 2030 [3]. Therefore, to some extent, this visualization project would make valuable contributions to the existing literature by providing a thorough overview on this persistent problem in Africa.

2. INTENDED AUDIENCES

First, according to the process of visualization development, an effective starting point of a visualization project is to clearly identify end user's needs and objectives. Therefore, pointing out intended audiences for this project would be helpful in finding key aspects of the data to focus on visualizing. Despite the scope of this project, my intended audiences are the wider public. Or in other words, my purpose is to propagate the seriousness of food insecurity in African to anyone who is interested. In the next section, main features of this project and their associated design principles will be discussed.

3. MAIN FEATURES AND DESIGN

3.1 Data

It is stated in [5] that "the objective of food security indicators and measurements is to capture some or all the main components of food security in terms of food availability, accessibility, and utilization/adequacy. However, the second component is largely elusive and context-specific". Therefore, I will only include data for the first and the last component. In terms of food availability, I used the data of Food Price Index [6]. For food utilization/ adequacy, the share of population who are undernourished vs GDP per capita and Global Food Security Index (GFSI) [7] could be significant.

3.2 Dashboard

For this project, I have decided to construct a 2x2 dashboard that has a menu box for custom filtering. I believe that showing a coordinated view of the most important features not only helps users to achieve their objective of each visual, but also provides a compact overview of the situation.

3.3 Global Food Security Index (GFSI) [7]

According to the design basics, information is usually read from top to bottom, left to right. Thus, the most important information of the topic will be placed in the first position of the dashboard. To compare this index among African countries, I utilized a map with each country's name on it (Figure 1) to showcase the level of insecurity. Because this index are interval values, map's unequal area could potentially distort the view of users. Hence, I used a red saturated color scale to evaluate severity. The color is chosen on [8] that colorblind people could also observe with ease. Furthermore, I also included a slider that runs from 2012-2020 to illustrate changes over time. A legend explaining benchmarks of the color scale is also included for clarification.

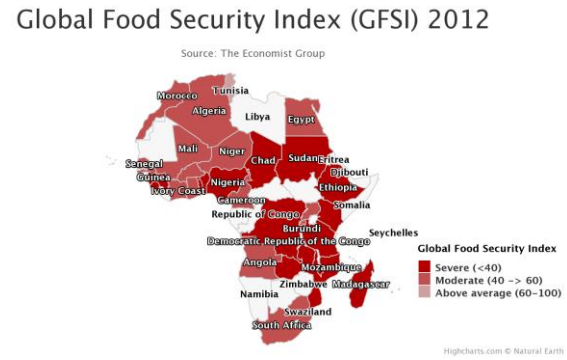

Figure 1. Global Food Security Index (2012-2021)

3.4 Food insecurity population percentages

After showing overview of the data, more specific details are presented as in Figure 2. This data is measured by percentages, so I used a stacked bar chart to compare the size of each component. There are options in the menu box to choose a specific country to investigate their figure. This is aligned with Schneiderman's [9] tasks to filter and select details on demand.

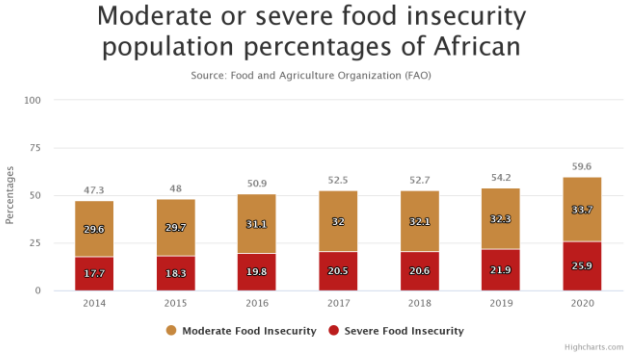

Figure 2. Moderate or severe food insecurity population percentages in Africa (2014-2020)

3.5 Undernourished percentage vs. GDP per capita

For the goal of displaying food utilization and adequacy, the percentage of undernourished adults and GDP per capita of each African country is used. To indicate the relationship between

these variables, a bubble chart (like a scatterplot) that showcases 3 data dimensions is used. The third dimension will determine the size of each bubble using relative GDP of each country to compare with the average GDP of Africa (Figure 3). A slider running from 2001-2017 will also be used to view variations through time. I also marked the average values of each axis to categorize African countries into 3 major groups.

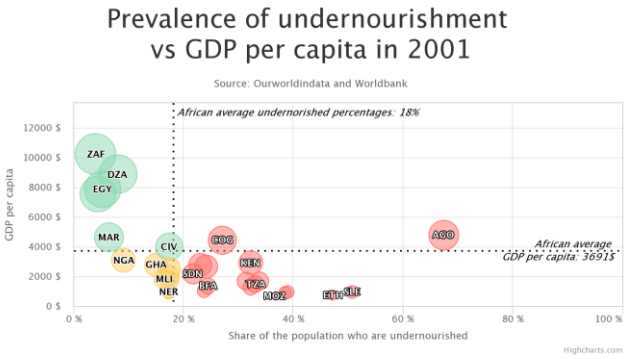

Figure 3. Prevalence of undernourishment vs GDP per capita in 2021

3.6 Food Price Index [6]

Finally, a simple line chart of the Food Price Index will be included to illustrate food availability. Several other related indexes (Meat Price Index, Dairy Price Index, etc.) are also included in the menu box for optional comparison. The data is a long time series ranging from 1990 to 2022.

Figure 4. Food Price Index (1990-2022).

4. CONCLUSION

The visualization project of Africa hunger and food insecurity could be enhanced in several ways. First, due to the unavailability of data in some countries, a list of only 21 African countries is used. Second, the dashboard could not capture the aspect of food accessibility, also due to the lack of data. Thus, in the future, this project would still require more in-depth analyses.

5. REFERENCES

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