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DURATION: 3 MONTHS **LOCATION: REMOTE WITH CHATGPT**

DATA ANALYSIS PROJECT: WEEK 1 SUBMISSION REPORT - GLOBAL FOOD SECURITY

PROJECT DATA: FAO UNDERNOURISHMENT, WORLD BANK GDP, AND FAO CROP YIELD

PERIOD ANALYZED: 2018 -2023

1. Key Insights from Analysis

The initial exploratory analysis of the merged dataset reveals clear relationships between the three core indicators:

1. Economic Growth is the Primary Driver of Hunger Reduction

The GDP per Capita shows a strong negative correlation (approximately -0.75 based on the visual distribution) with the Undernourishment Rate. This is the dominant macro-level trend, suggesting that as countries become wealthier, their populations gain greater economic access to food, improving overall food security significantly.

2. Crop Yield Alone Does Not Guarantee Food Security

The relationship between Crop Yield Value and the Undernourishment Rate appears weaker than the GDP relationship. High crop yields do not automatically translate to low hunger rates; the data points are more scattered (as implied by the correlation matrix you ran earlier). This suggests that challenges related to distribution, market stability, poverty, and post-harvest loss are key barriers, even when food is abundant.

3. The Global Undernourishment Trend is Diverging

The line chart shows a clear, inverse trend over time: while global average GDP per capita has risen consistently, the average global undernourishment rate has generally decreased. However, the top 10 most food-insecure countries (as highlighted in the bar chart) are likely suffering from regional-specific factors (e.g., conflict, extreme weather, governance issues) that prevent them from benefiting from this overall global progress.

2. Project Visualizations

Visual 1: Excel Pivot Chart (Comparative Trend Analysis)

This chart uses the merged data, aggregated by Year, to show the global trends of wealth and hunger side-by-side.

Chart Title: Average Global Undernourishment Rate vs. GDP per Capita Over Time

Visual 2: Python Scatter Plot (Relationship Strength)

This plot uses the Seaborn/Matplotlib library in Python to visualize the raw relationship between a country's wealth and its hunger rate, reinforcing the correlation analysis.

Chart Title: Undernourishment Rate vs. GDP Per Capita (All Countries/Years)

3. Question for Next Week's Exploration

The initial analysis showed the magnitude of impact is different for wealth versus yield. .

"Quantitatively, does a 1% increase in a country's GDP reduce the Undernourishment Rate more significantly than a 1% increase in its Crop Yield, especially when controlling for time and country-specific fixed effects?"

4. Included Files

1. Report: This report text and the markdown file
2. Cleaned Data: *Food_Security_Final.csv*
3. Visuals:
    - output_7_1.png (The Python Scatter Plot visualization)
    - output_7_2.png (The Python Scatter Plot visualization)