Final Project Report

1. Introduction

1.1. Project overview :

This project focuses on analyzing global malnutrition trends using Power BI to gain insights into undernourishment across different countries, regions, and years. It helps identify critical patterns and supports data-driven decisions for combating malnutrition globally.

1.2. Objectives :

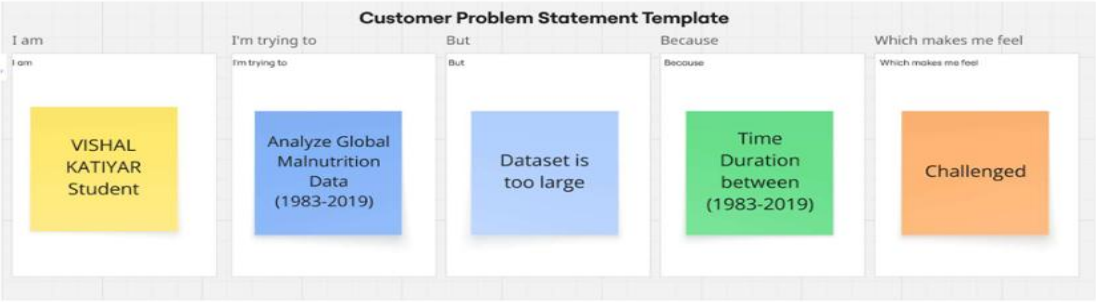
1. To analyze global malnutrition data across countries, years, and income levels.
2. To identify regions most affected by undernourishment and food insecurity.
3. To visualize trends and patterns in malnutrition using interactive Power BI dashboards.
4. To support policy-makers, researchers, and NGOs with data-driven insights.
5. To highlight the correlation between income levels, food production, and undernourishment.

2. Project Initialization and Planning Phase

2.1. Define Problem Statement :

Malnutrition remains a critical global challenge, especially in low-income regions, but the lack of accessible, visual, and data-driven tools limits the ability of stakeholders to understand, monitor, and address this issue effectively.

Example:



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	VISHAL KATIYAR (STUDENT)	Analyze Global Malnutrition Data (1983-2019)	Dataset is too large	Time Duration between (1983-2019)	Challenged

2.2. Project Proposal (Proposed Solution) : To develop an interactive Power BI dashboard that analyzes global malnutrition data by country, year, and income level, enabling users to identify trends, compare regions, and gain actionable insights for decision-making and policy formulation**.**

Project Overview	
Objective	To analyze global malnutrition trends using Power BI to uncover insights for awareness and informed decision-making.
Scope	This project covers the analysis of malnutrition data across countries and years using Power BI to visualize key indicators like undernourishment, stunting, and wasting.
Problem Statement	
Description	Malnutrition remains a global challenge due to lack of accessible insights, which this project addresses through Power BI-based analysis and visualization.
Impact	This project helps raise awareness and support data-driven decisions to reduce malnutrition by providing clear, interactive insights through Power BI.
Proposed Solution	
Approach	Use Power BI to clean, model, and visualize malnutrition data for identifying trends, patterns, and high-risk regions globally.
Key Features	The project features interactive dashboards with country-wise, year-wise, and income-based visual analysis of key malnutrition indicators.

2.3. Initial Project Planning :

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members	Sprint Start Date	Sprint End Date (Planned)
Sprint-1	Data Collection	GMTUPB-2	Data Gathering	3	High	Vishal Katiyar	19/07/2025	23/07/2025
Sprint-1	Data Preparation	GMTUPB-4	Data Loading	1	Medium	Vishal Katiyar	19/07/2025	23/07/2025
Sprint-1		GMTUPB-5	Data Understanding	4	Medium	Vishal Katiyar	19/07/2025	23/07/2025
Sprint-1		GMTUPB-6	Data Cleaning	4	High	Vishal Katiyar	19/07/2025	23/07/2025
Sprint-2	Data Visualization	GMTUPB-8	Card	2	Medium	Vishal Katiyar	24/07/2025	26/07/2025
Sprint-2		GMTUPB-9	Stacked Area Chart	3	High	Vishal Katiyar	24/07/2025	26/07/2025
Sprint-2		GMTUPB-10	Line and Stacked Column Chart	4	High	Vishal Katiyar	24/07/2025	26/07/2025
Sprint-2		GMTUPB-11	Ribbon Chart	3	High	Vishal Katiyar	24/07/2025	26/07/2025
Sprint-2		GMTUPB-12	Gauge Chart	2	Medium	Vishal Katiyar	24/07/2025	26/07/2025
Sprint-2	Dashboard	GMTUPB-14	Dashboard Creation	4	High	Vishal Katiyar	24/07/2025	26/07/2025
Sprint-3	Report	GMTUPB-16	Design of Report	4	High	Vishal Katiyar	27/07/2025	30/07/2025
Sprint-3	Performance Testing	GMTUPB-18	Amount of Data Loaded	2	Medium	Vishal Katiyar	27/07/2025	30/07/2025
Sprint-3		GMTUPB-19	Utilization of filters	2	Medium	Vishal Katiyar	27/07/2025	30/07/2025
Sprint-3		GMTUPB-20	Number of Visualizations	3	High	Vishal Katiyar	27/07/2025	30/07/2025
Sprint-3	Project Demonstration and Documentation	GMTUPB-23	Record Explanation Video	3	High	Vishal Katiyar	27/07/2025	30/07/2025
Sprint-3		GMTUPB-24	Create Documentation	4	High	Vishal Katiyar	27/07/2025	30/07/2025

3. Data Collection and Preprocessing Phase

3.1. Data Collection Plan and Raw Data Sources Identified :

Section	Description
Project Overview	This project aims to analyze global malnutrition data using Power BI to uncover trends and patterns across countries, years, and income groups.
Data Collection Plan	This data collected by Kaggle and Smart internz.
Raw Data Sources Identified	Data is collect from Kaggle and Smart Internz. Malnutrition across the globe

Raw Data Sources Template

Source Name	Description	Location/URL	Format	Size	Access Permissions
Kaggle	Global Malnutrition Trends Data, Includes rows 924 and columns 20	Malnutrition across the globe	CSV	2 MB	Public

3.2. Data Quality Report :

Data Source	Data Quality Issue	Severity	Resolution Plan
Kaggle	I faced such issues like null values, Duplicate values and Data types.	Moderate	I analyze dataset, then remove null values , duplicate values and change the data types according to values.

3.3. Data Exploration and Preprocessing :

Section	Description
Data Overview	This project aims to analyze global malnutrition data using Power BI to uncover trends and patterns across countries, years, and income groups.
Data Cleaning	Handle missing values, duplicates, and correct errors also change data type according to their values like in Underweight , overweight and Stunning etc.
Data Transformation	Use of Power Query for filtering like underweight, Overweight and Stunning and remove some columns like source column and Author etc.
Data Type Conversion	Rectifying Datatype in Severe Wasting.
Column Splitting and Merging	NIL
Data Modeling	Define relationships between tables many to one.
Save Processed Data	Change the name to Malnutrition and CountryDetails.

4. Data Visualization :

4.1. Framing Business Questions :

1. What is the Count of under 5 Population in Malnutrition trends?

Visualization: Card showing Count of under 5 population.

2. How many Survey Sample in Malnutrition Trends Dataset?

Visualization: Card describes Sum of Survey Samples.

3. How many Total underweight in Malnutrition Trends?

Visualization: Card describe Sum of Underweight.

4. What is the overweight's by country?

Visualization: Stacked Area Chart Showing Sum of Overweight by country.

5. What is the Sum of LDC, Sum of LIFD, Sum of LLDC or SISD2 and Average of Stunning by Income Analysis?

Visualization: Line and Stacked Column Chart Showing Sum of LDC, Sum of LIFD, Sum of LLDC or SISD2 and Average of Stunning by Income Analysis.

6. What is the Sum of Overweight and Sum of Underweight by Income Analysis?

Visualization: Ribbon Chart showing Sum of Overweight and Sum of Underweight by Income Analysis.

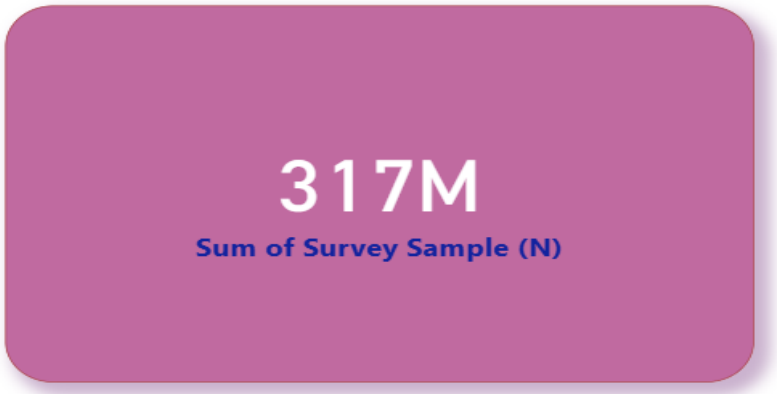
7. What is Sum of income classification?

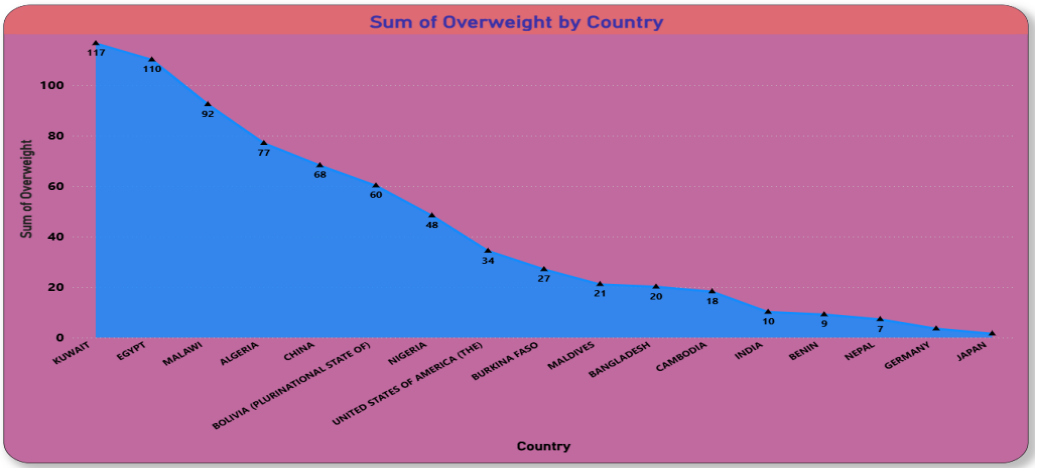
Visualization: Gauge Chart showing sum of income classification.

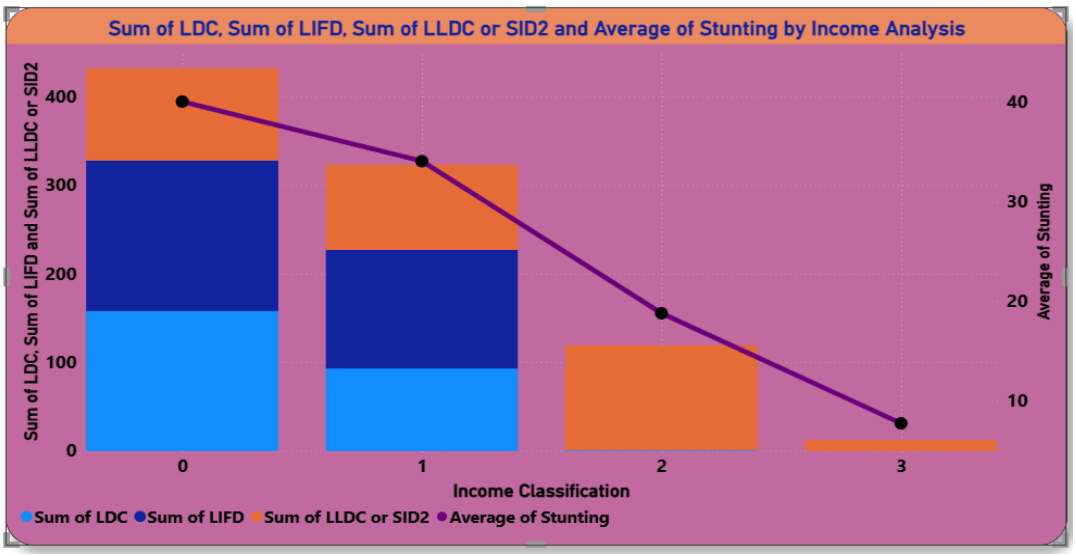
8. What is the size of Dataset?

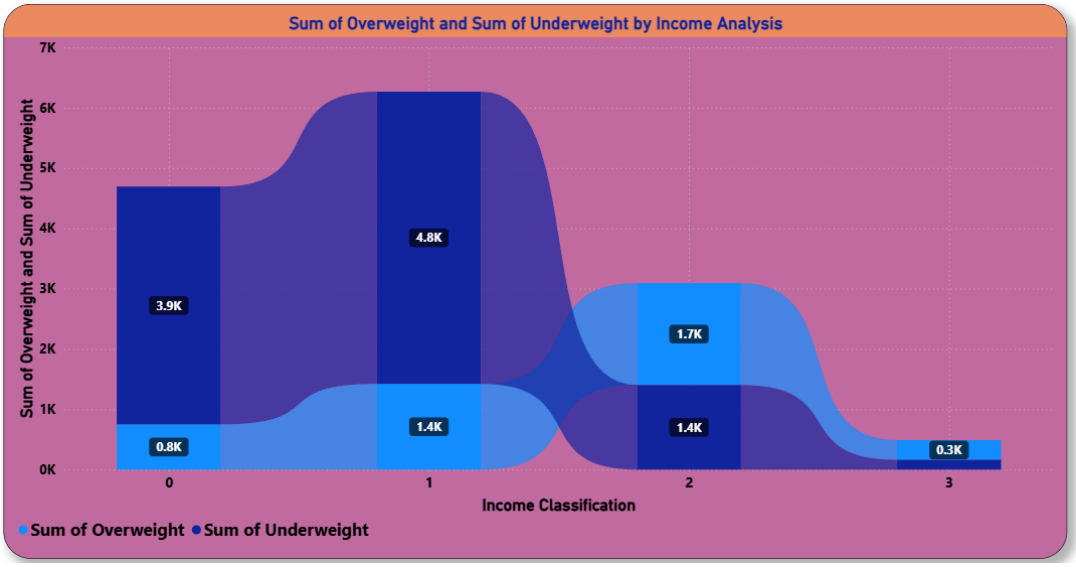
Visualization: Excel Sheet Showing Global Malnutrition Trends Data. o Size: 924 rows and 20 columns.

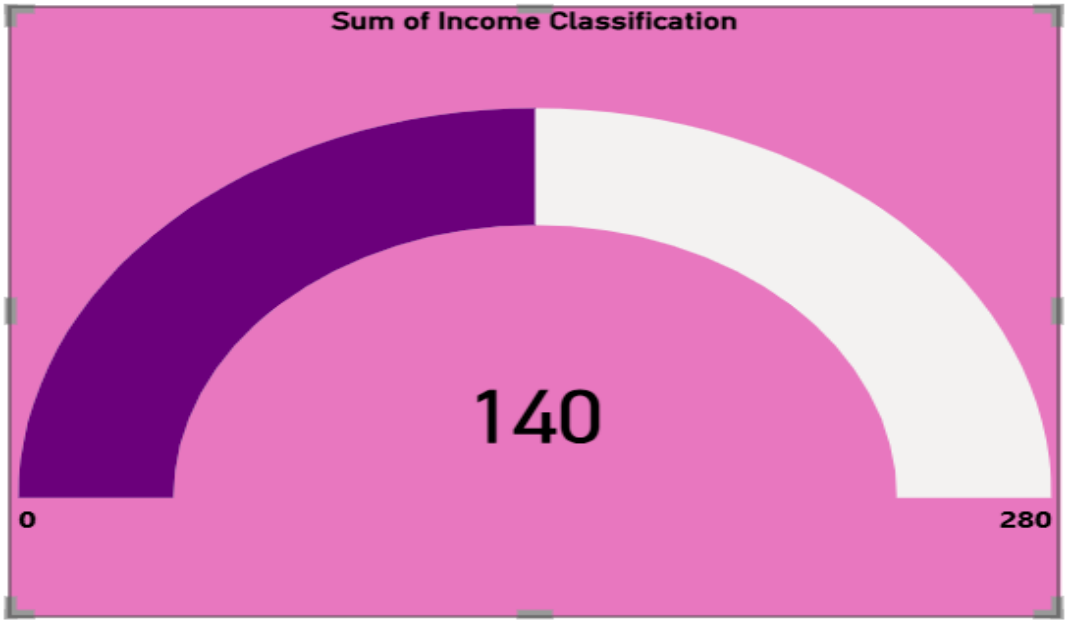
4.2. Developing Visualizations :






Sum of LDC, Sum of LIFD, Sum of LLDC or SID2 and Average of Stunting by Income Analysis
Sum of LDC, Sum of LIFD and Sum of LLDC or SID2
400
300
200
100
0
40
30
20
10
Average of Stunting
0
1
2
3
Income Classification
Sum of LDC
Sum of LIFD
Sum of LLDC or SID2
Average of Stunting


Sum of Overweight and Sum of Underweight by Income Analysis
Sum of Overweight and Sum of Underweight
7K
6K
5K
4K
3K
2K
1K
0K
3.9K
4.8K
1.7K
0.8K
1.4K
1.4K
0.3K
0
1
2
3
Income Classification
Sum of Overweight
Sum of Underweight


Sum of Income Classification
140
0
280

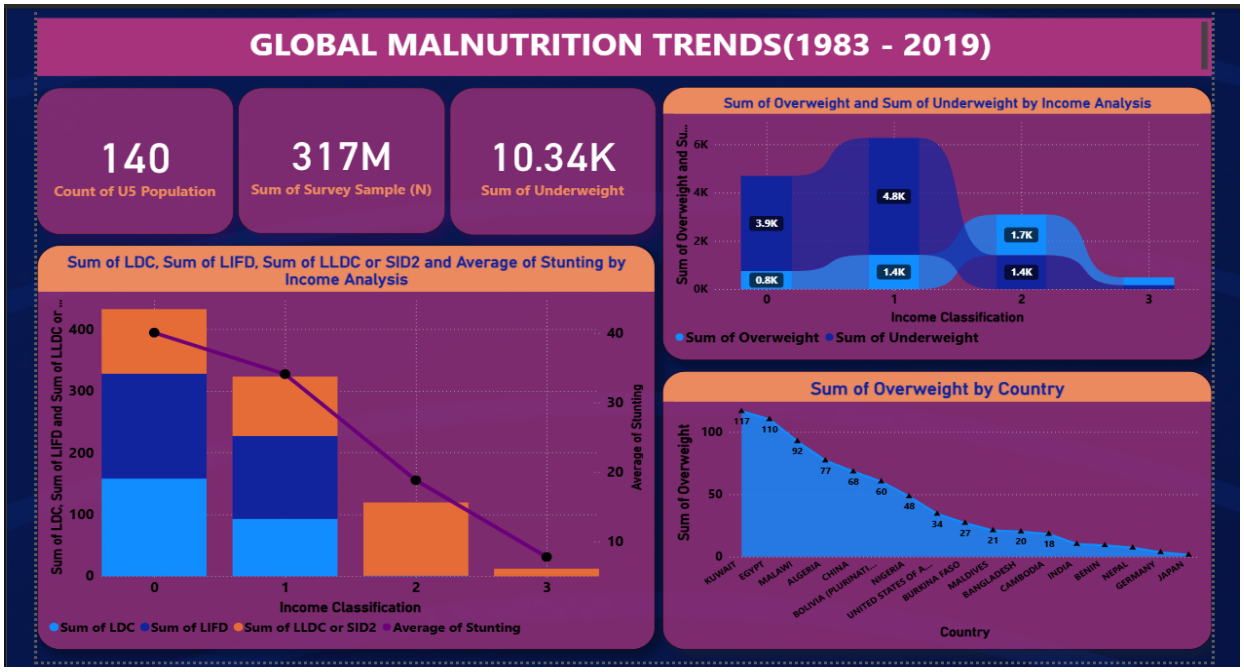
ISO code	Country	Survey Year	Year	Income Classification	LDC	LIFD	LLDC or SID2	Survey Sample (N)	Severe Wasting	Wasting
CMR	CAMEROON	1991	1991	1	0	1	0	2421	1.1	
CMR	CAMEROON	1998	1998	1	0	1	0	2070	1.8	
CMR	CAMEROON	2004	2004	1	0	1	0	3867	2.3	
CMR	CAMEROON	2006	2006	1	0	1	0	6077	2.6	
CMR	CAMEROON	2011	2011	1	0	1	0	6014	2	
CMR	CAMEROON	2014	2014	1	0	1	0	6776	1.3	
COG	CONGO (THE)	2005	2005	1	0	1	0	4697	3	
COG	CONGO (THE)	2011-12	2011	1	0	1	0	4648	1.7	
COG	CONGO (THE)	2014-15	2014	1	0	1	0	8757	2.6	
CIV	COTE D'IVOIRE	1994	1994	1	0	1	0	3486	2.2	
CIV	COTE D'IVOIRE	1998-99	1998	1	0	1	0	1690	1.9	
CIV	COTE D'IVOIRE	2006	2006	1	0	1	0	8482	3.1	
CIV	COTE D'IVOIRE	2007	2007	1	0	1	0	854	5.4	
CIV	COTE D'IVOIRE	2011-12	2012	1	0	1	0	3680	1.8	
CIV	COTE D'IVOIRE	2016	2016	1	0	1	0	8809	1.2	
EGY	EGYPT	1988	1988	1	0	0	0	2077	0.6	
EGY	EGYPT	1991	1991	1	0	0	0	3614	2.3	
EGY	EGYPT	1992-93	1993	1	0	0	0	7644	1.8	
EGY	EGYPT	1995-96	1995	1	0	0	0	10226	2.3	
EGY	EGYPT	2003	2003	1	0	0	0	5940	1.8	
EGY	EGYPT	2005	2005	1	0	0	0	12828	2.5	
EGY	EGYPT	2008	2008	1	0	0	0	10047	3.8	

5. Dashboard :

5.1. Dashboard Design File :

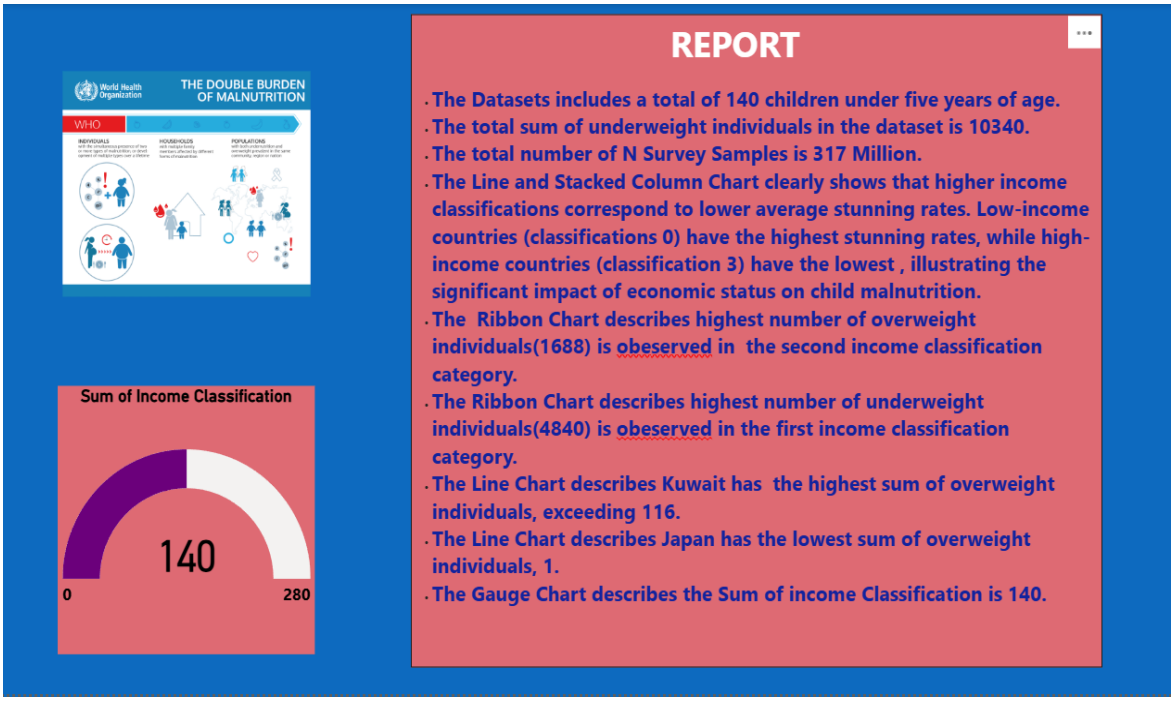
Here are five potential outcomes from the dashboard image provided:

1- The dataset includes a total of 140 children under five years of age.
2- The total sum of underweight individuals in the dataset is 10,340.
3- The total number of N Survey Samples is 317 million.
4- The Line Chart describes that Kuwait has the highest sum of overweight individuals, exceeding 116.
5- The Gauge Chart describes the sum of income classification is 140**.**



6. Report:

6.1. Story Design File:



Observations drawn from reports in Power BI can provide valuable insights into business performance and trends.

1. Malnutrition by Income Classification: The Line and Stacked Column Chart reveals that low-income countries (classification 0) have the highest stunting rates, while high-income countries (classification 3) show the lowest, highlighting the economic impact on child nutrition.

2. Underweight Distribution: The Ribbon Chart indicates that the highest number of underweight individuals (4,840) is seen in the first income classification, showing a concentration of undernutrition in lower economic groups.

3. Overweight Patterns: The second income classification category reports the highest number of overweight individuals (1,688), as per the Ribbon Chart, suggesting changing nutritional problems in mid-income countries.

4. Country-Specific Insights: a. Kuwait has the highest count of overweight individuals (116), as seen in the Line Chart. b. Japan has the lowest, with only 1 overweight individual, reflecting strong national health practices.

5. Total Data Summary: a. The dataset includes data on 140 children under five years. b. A total of 10,340 underweight cases and 317 million survey samples were analyzed. c. The Gauge Chart reflects a sum of income classifications totaling 140**.**

7. Performance Testing:

7.1 Utilization of Data filters :

- **Country Filter:**
  Allows users to view malnutrition statistics for a specific country.

- **Income Group Filter:**
  Helps identify the impact of income levels (Low, Lower-Middle, Upper-Middle, High) on malnutrition.

- **Dynamic Visual Interactions:**
  Filters were used with slicers and cross-highlighting to make visual components responsive to user selections, enhancing dashboard usability.

7.2 No of Visualization:

- Card
- Stacked Area Chart
- Line and Stacked Column Chart
- Ribbon Chart
- Gauge Chart

8. Conclusion/Observation:

The Global Malnutrition Analysis Dashboard successfully highlights critical patterns in undernourishment across countries, regions, and income groups. Through interactive visualizations, it becomes evident that malnutrition is significantly more prevalent in low-income countries, particularly in regions such as Sub-Saharan Africa and South Asia.

The year-wise trend analysis reveals that while some regions have shown gradual improvement, others remain highly vulnerable. Furthermore, a clear correlation is observed between income levels and the prevalence of food insecurity and undernourishment.

By using filters and dynamic visuals, the dashboard enables policymakers, researchers, and NGOs to focus on specific areas, helping them make informed decisions to address food insecurity. The project demonstrates how data visualization can turn raw data into actionable insights.

9. Future Scope:

 Integration of More Recent Datasets:
Incorporating the latest data (post-2023) to keep the dashboard relevant and up-to-date.

 Inclusion of Additional Indicators:
Adding other health and nutrition indicators like child stunting, wasting, obesity, and micronutrient deficiencies.

 Predictive Analytics:
Using machine learning or statistical forecasting to predict future malnutrition trends.

 Mobile/Cloud Deployment:
Publishing the dashboard on Power BI Service or embedding it into websites/apps for broader accessibility.

 Comparative Analysis with Other Global Goals:
Linking malnutrition data with SDG indicators (e.g., poverty, education, clean water) for a holistic view.

 Localization Features:
Allowing users to translate the dashboard into different languages for global usability.

10. Appendix:

Project Demo Link:

https://drive.google.com/file/d/1zZtwBSajEzsLRVEwGjHhVDKNwlUWxJXH/view?usp=sharing