

GLOBAL UNDERNUTRITION

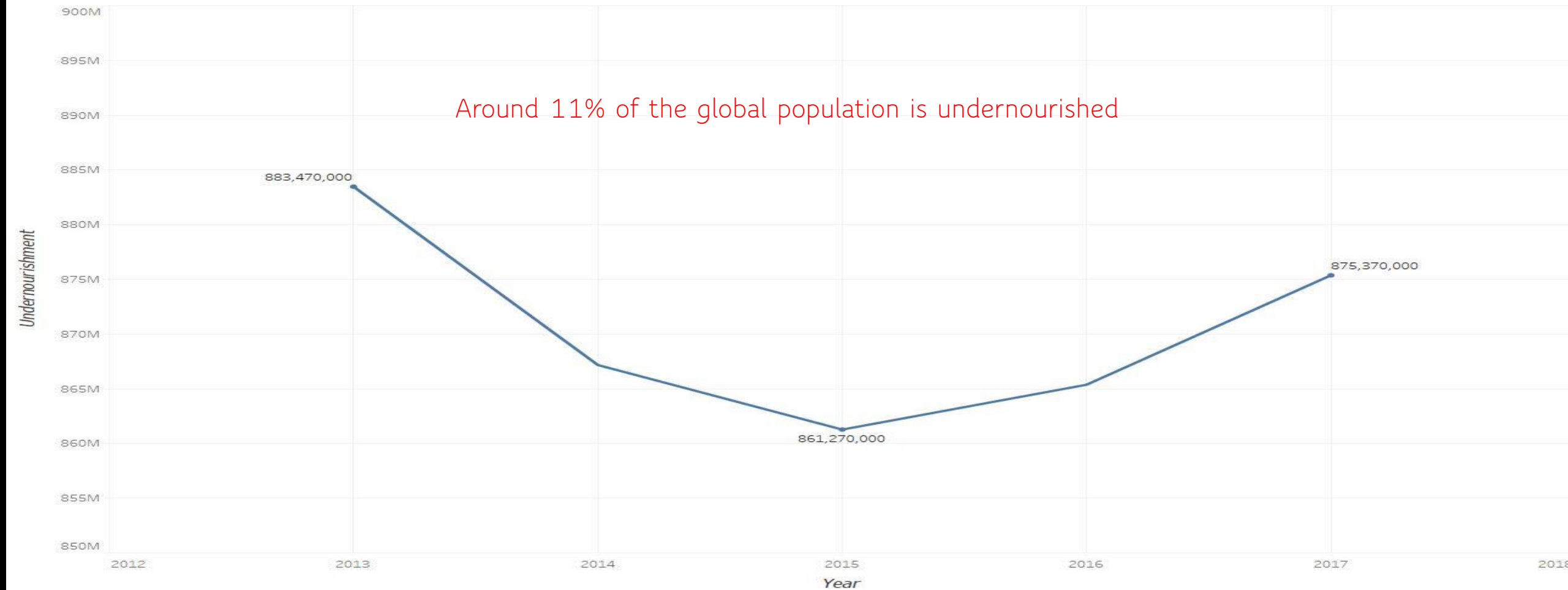
1 IN 9 PEOPLE AROUND THE WORLD GO
HUNGRY EACH DAY

PUBLIC HEALTH STUDY(FAO*)



**A Child Dies From Hunger
Every 10 Seconds**

World Undernourishment Over Years. 2013-2017

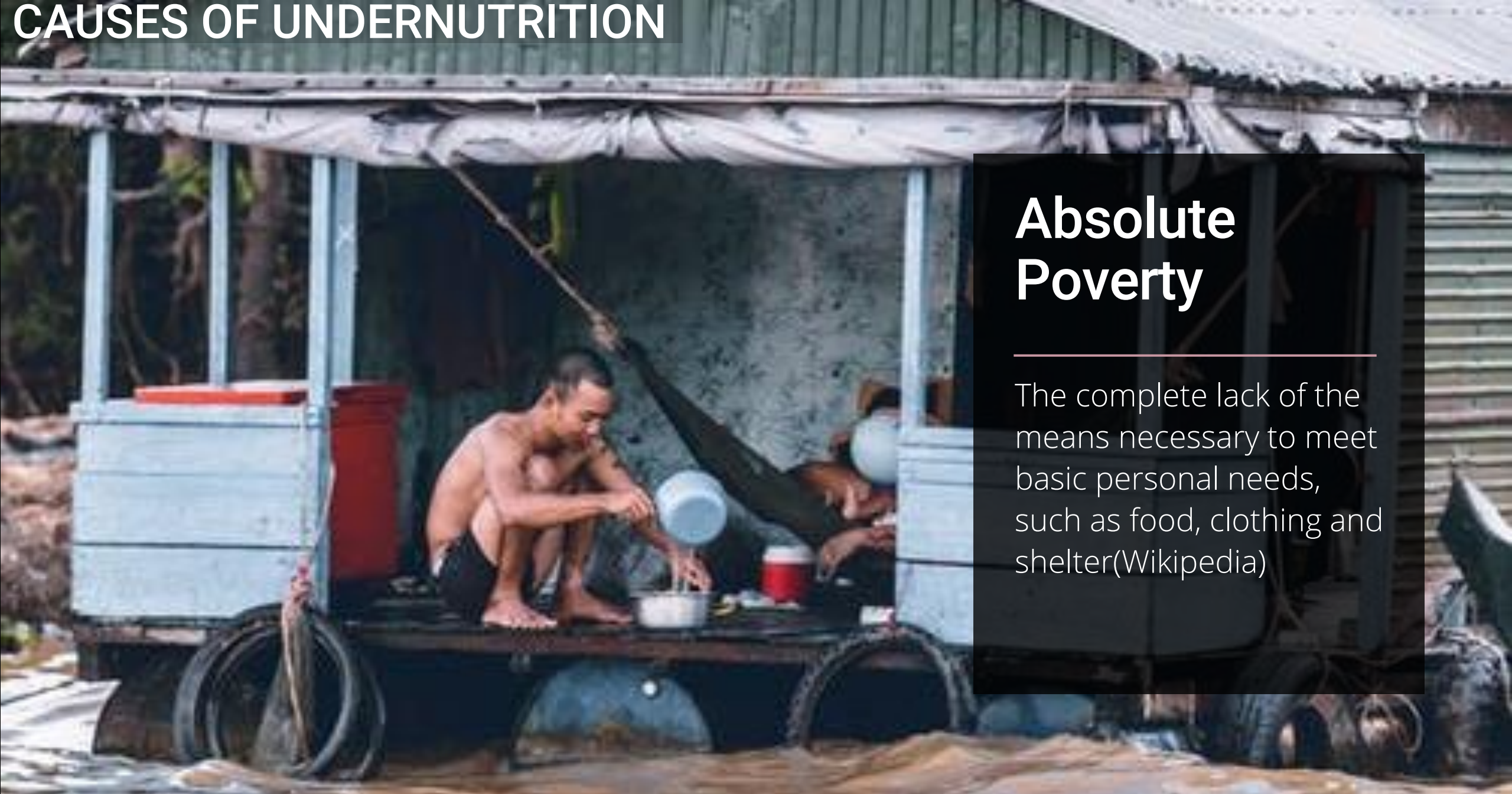


The Number Of Chronic Undernutrition is Increasing

But What Are The Causes Of Hunger In The World ?

Absolute Poverty

The complete lack of the means necessary to meet basic personal needs, such as food, clothing and shelter(Wikipedia)





Food Shortage

In country afflicted by
pandemic like COVID-19

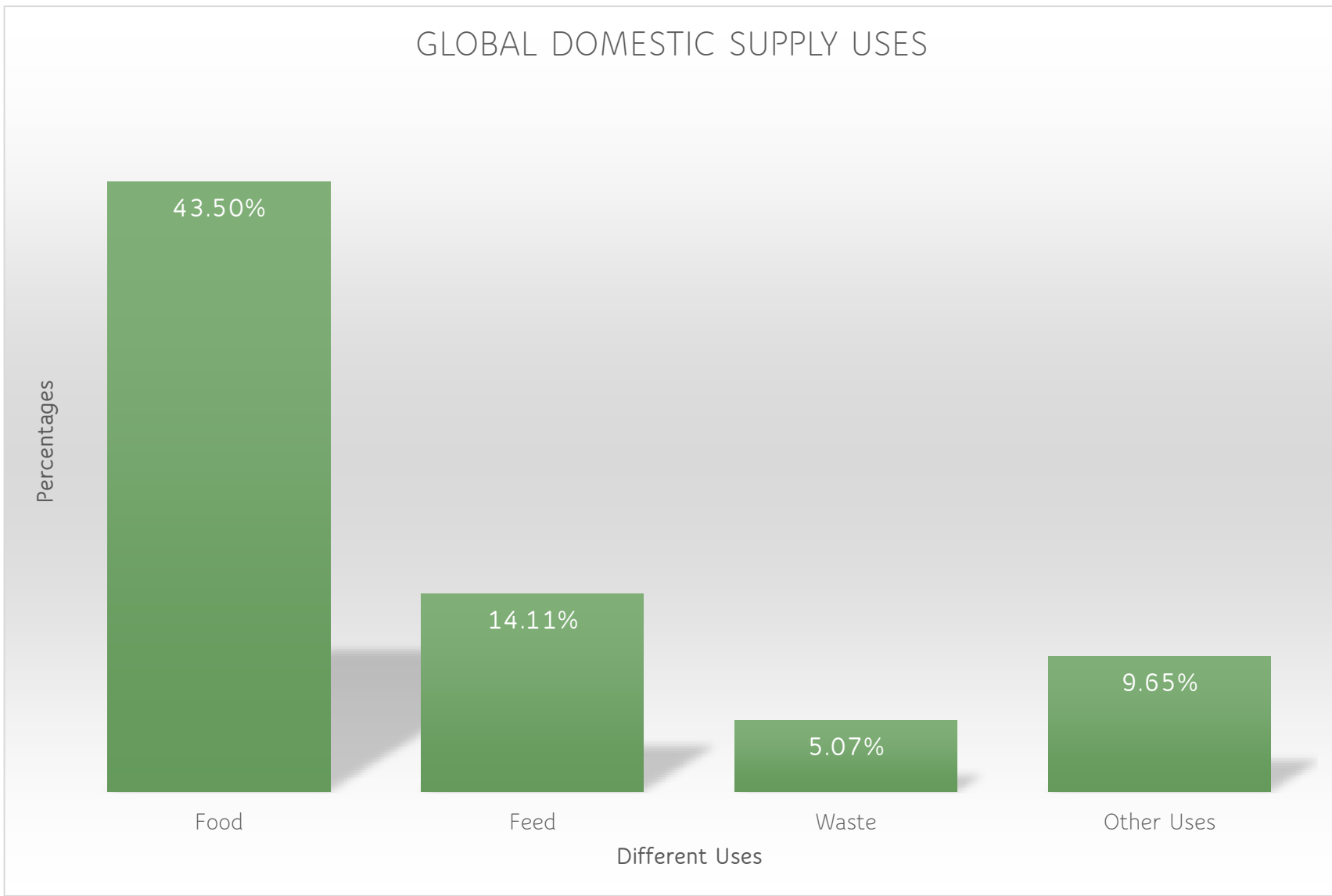
Food Waste

1/3 of the global food production is wasted.

The background of the slide is a photograph of several burlap sacks filled with different types of grains and legumes. The sacks are arranged in a way that shows the contents: white rice, yellow cornmeal, black beans, white beans, and various types of seeds and lentils. The lighting is warm, and the overall tone is earthy and natural.

An Irrational Food Consumption

How is the Global Domestic Supply Used Considering Only Plant Products?



3 Highest Items Exported

Considering Other Supply Ratio

Palm Oil



Coconut Oil



Alcohol



Considering Feed Food Ratio

Barley




Soya beans



Maize



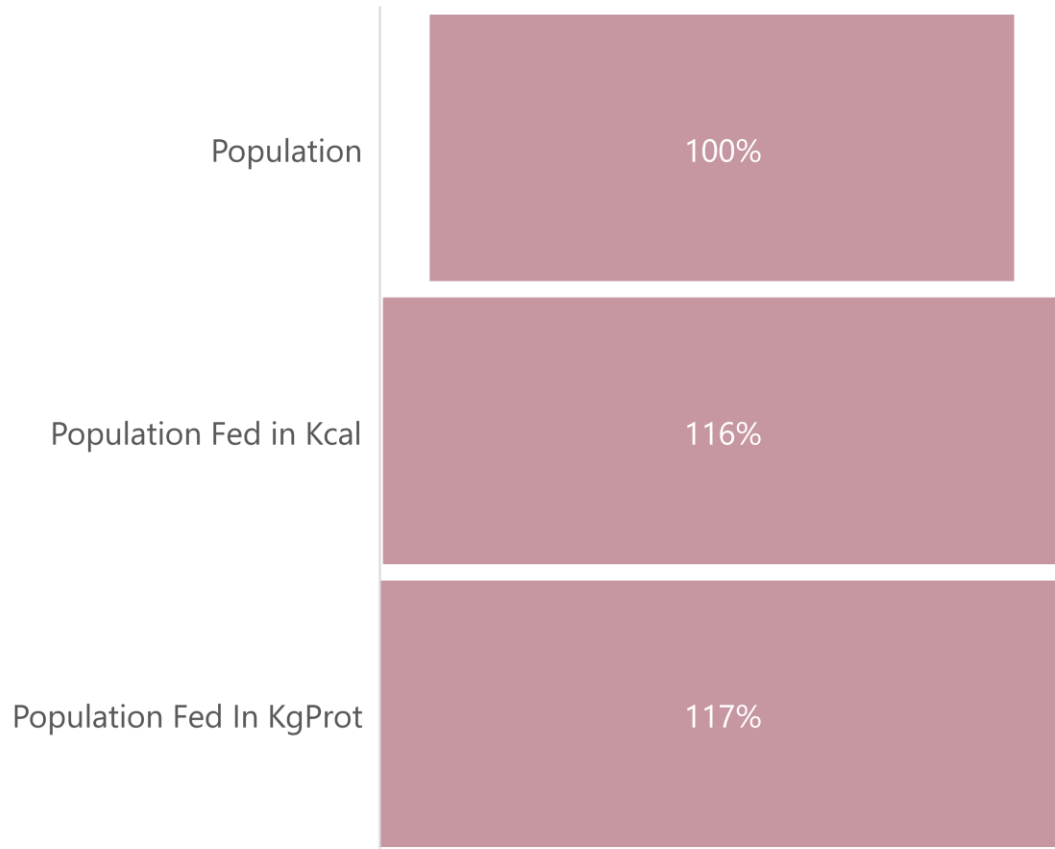


Exportation is Another Insanity

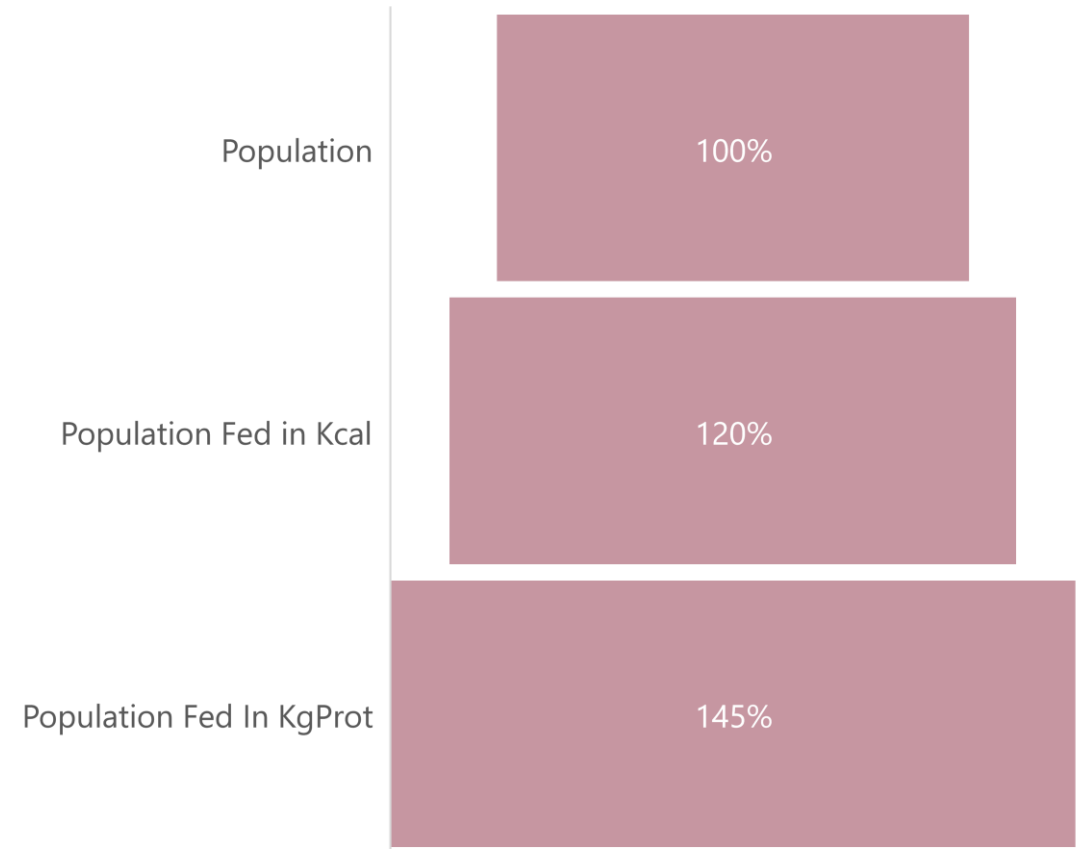
Thailand export 83% of its production of Cassava, while around 9% of its population is undernourished.

We Are Producing Enough Food For The Entire Planet

Considering Vegetal



Considering Global Food Supply



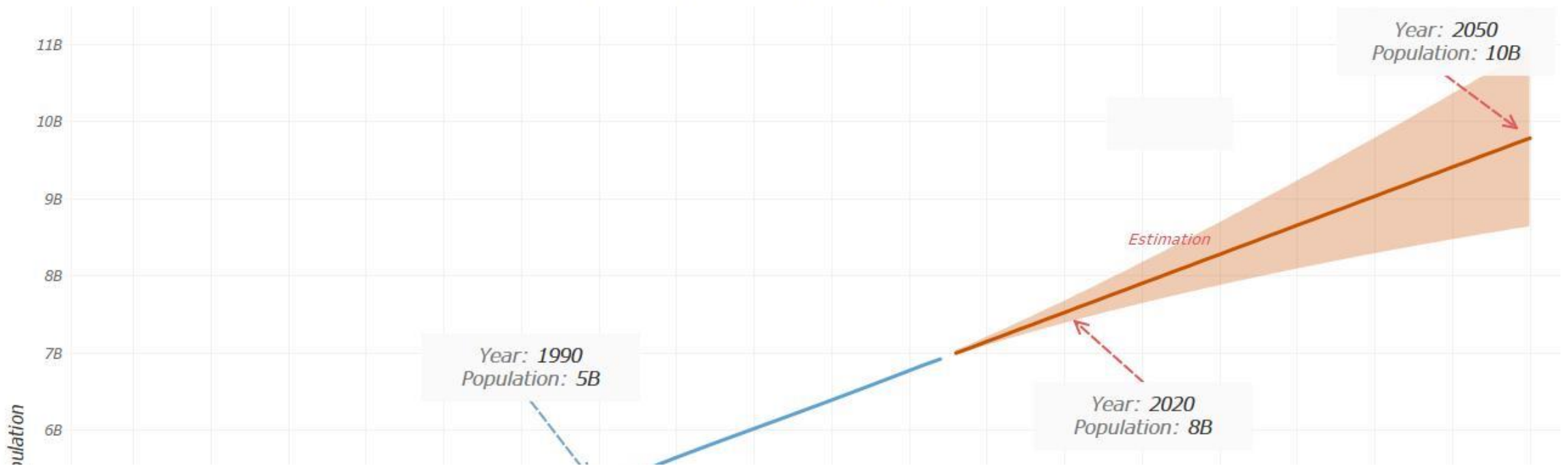
According to the Dietary Guidelines A human need an average of **2400** calories per Day.



46% of Cereals is used for feed

If United States reduces its production of animal products by 10%, 14 million tons of cereals could be released.

POPULATION ESTIMATION IN 2050



Population Growth is Not a Problem

Conclusion



THE NUMBER OF
CHRONIC
UNDERNUTRITION IS
INCREASING

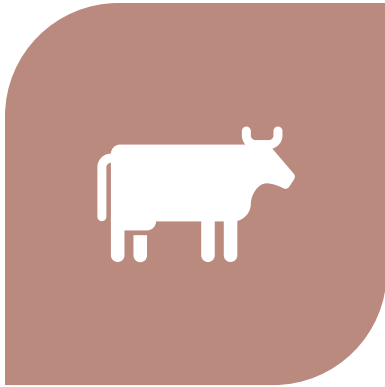


THE WORLD HUNGER IS
NOT DUE TO A LACK OF
PRODUCTION



WE ARE PRODUCING
ENOUGH FOOD FOR THE
ENTIRE PLANET.

But There Are Some Solutions



REDUCE THE MEAT
CONSUMPTION



IMPROVE THE LOGISTIC TO
AVOID FOOD SHORTAGE



GOVERNMENTS MUST CHANGE
THEIR EXPORTATION POLITICS

INFORMATION ABOUT THE DATASET

All the data has been downloaded from the FAO(<http://www.fao.org/faostat/en/#data>) website.

```
# Store the file names in the file_names variable
file_names = glob('files/*.csv')
# Check the file_names list
file_names

['files\\food_balance_animal.csv',
 'files\\food_balance_cereals.csv',
 'files\\food_balance_vegetal.csv',
 'files\\food_security_indicators.csv',
 'files\\population.csv']
```

food_balance_animal.csv

```
# Check the dataframe info  
food_balance_animal.head(2)
```

	Domain Code	Domain	Country Code	Country	Element Code	Element	Item Code	Item	Year Code	Year	Unit	Value	Flag	Flag Description
0	FBS	Food Balance Sheets	2	Afghanistan	5511	Production	2731	Bovine Meat	2013	2013	1000 tonnes	134.0	S	Standardized data
1	FBS	Food Balance Sheets	2	Afghanistan	5611	Import Quantity	2731	Bovine Meat	2013	2013	1000 tonnes	6.0	S	Standardized data

food_balance_vegetal.csv

```
# Check the dataframe info
food_balance_vegetal.head(2)
```

	Domain Code	Domain	Country Code	Country	Element Code	Element	Item Code	Item	Year Code	Year	Unit	Value	Flag	Flag Description
0	FBS	Food Balance Sheets	2	Afghanistan	5511	Production	2511	Wheat and products	2013	2013	1000 tonnes	5169.0	S	Standardized data
1	FBS	Food Balance Sheets	2	Afghanistan	5611	Import Quantity	2511	Wheat and products	2013	2013	1000 tonnes	1173.0	S	Standardized data

food_balance_cereals.csv

```
# Check the dataframe info
food_balance_cereals.head(2)
```

	Domain Code	Domain	Country Code	Country	Element Code	Element	Item Code	Item	Year Code	Year	Unit	Value	Flag	Flag Description
0	FBS	Food Balance Sheets	2	Afghanistan	5511	Production	2511	Wheat and products	2013	2013	1000 tonnes	5169.0	S	Standardized data
1	FBS	Food Balance Sheets	2	Afghanistan	5611	Import Quantity	2511	Wheat and products	2013	2013	1000 tonnes	1173.0	S	Standardized data

food_security_indicators.csv

```
# Check the dataframe info
food_security_indicators.head(2)
```

	Domain Code	Domain	Area Code	Area	Element Code	Element	Item Code	Item	Year Code	Year	Unit	Value	Flag	Flag Description	Note
0	FS	Suite of Food Security Indicators	2	Afghanistan	6132	Value	210011	Number of people undernourished (million) (3-y...	20122014	2012-2014	millions	7.9	F	FAO estimate	NaN
1	FS	Suite of Food Security Indicators	2	Afghanistan	6132	Value	210011	Number of people undernourished (million) (3-y...	20132015	2013-2015	millions	8.8	F	FAO estimate	NaN

population.csv

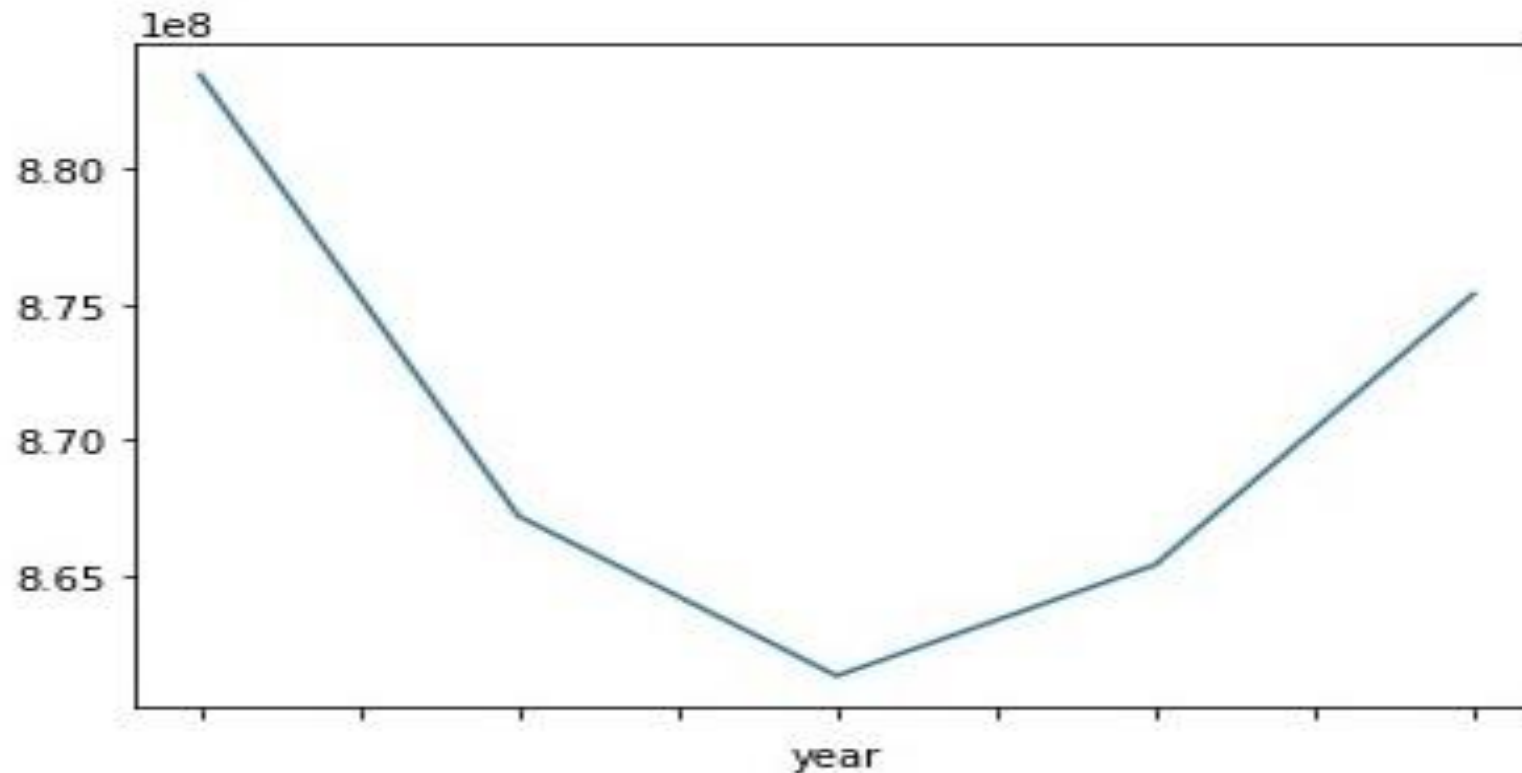
```
population.head(2)
```

	Domain Code	Domain	Country Code	Country	Element Code	Element	Item Code	Item	Year Code	Year	Unit	Value	Flag	Flag Description
0	FBS	Food Balance Sheets	2	Afghanistan	511	Total Population - Both sexes	2501	Population	1961	1961	1000 persons	8954.0	NaN	Official data
1	FBS	Food Balance Sheets	2	Afghanistan	511	Total Population - Both sexes	2501	Population	1962	1962	1000 persons	9142.0	NaN	Official data

Some Relational Algebra Operations

1. Aggregation

```
indicators_df.groupby("year").undernourishment.sum().plot();
```



Some Relational Algebra Operations

2.Join

```
# Create a temporary dataframe where we join the population and the food_balance dfs together
food_balance_full = pd.merge(population_2013, food_balance, how = "left", on = ["country", "country_code", "year"])
food_balance_full.head(2)
```

	country_code	country	year	population	item_code	item	origin	domestic_supply_quantity	export_quantity	fat_supply_quantity_gcapitaday	...	fo
0	2	Afghanistan	2013	30552000.0	2511	Wheat and products	vegetal	5.992000e+09	NaN	4.69	...	
1	2	Afghanistan	2013	30552000.0	2513	Barley and products	vegetal	5.240000e+08	NaN	0.24	...	

2 rows x 22 columns

Some Relational Algebra Operations

3.Projection

```
# Select the columns that we need
indicators_df = food_security_indicators.loc[:, ["Area Code", "Area", "Year", "Value"]]
# Change the columns name
indicators_df.columns = ["country_code", "country", "year", "undernourishment"]
# Turn the year variable into a categorical type
category_type = CategoricalDtype(categories = ["2012-2014", "2013-2015", "2014-2016", "2015-2017", "2016-2018"],
                                         ordered = True)
indicators_df.year = indicators_df.year.astype(category_type)
indicators_df.year = indicators_df.year.cat.rename_categories([2013, 2014, 2015, 2016, 2017])
indicators_df.head(2)
```

	country_code	country	year	undernourishment
0	2	Afghanistan	2013	7.9
1	2	Afghanistan	2014	8.8

Some Relational Algebra Operations

1.Restriction

```
# Find all the entries with china
china_agg = population_df[(population_df.Country.str.startswith("China") & (population_df.Year == 2013))]
china_agg
```

	Country Code	Country	Year	population
1624	96	China, Hong Kong SAR	2013	7.204000e+06
1677	128	China, Macao SAR	2013	5.660000e+05
1730	41	China, mainland	2013	1.385567e+09
1783	214	China, Taiwan Province of	2013	2.333000e+07
8621	351	China	2013	1.416667e+09