State of Malnutrition in Major Regions of the world

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Introduction

With world population expected to grow from 7 billion to 9 billion, which is a growth of 30% over the next four decades, the demand for food, food related products and agriculture systems will be greater than ever. The international community is committed to ending hunger and all forms of malnutrition worldwide by 2030 spearheaded by the United Nations through a deliberative process involving its 193 Member States, as well as global civil society and the private sector.

There is more than enough food produced in the world to feed everyone, yet 789 million people go hungry. As reflected in Sustainable Development Goal, one of the greatest challenges the world faces is how to ensure that a growing global population - projected to rise to around 10 billion by 2050 - has enough food to meet their nutritional needs. To feed another two billion people in 2050, food production will need to increase by 50 percent globally. Food security is a complex condition requiring a holistic approach to all forms of malnutrition, the productivity and incomes of small-scale food producers, resilience of food production systems and the sustainable use of biodiversity and genetic resources.

The worrisome trend in undernourishment is, however, not yet reflected in nutritional outcomes. Evidence on various forms of malnutrition points to continuous decreases as reflected in global and regional averages. At the same time, various forms of malnutrition are still cause for concern worldwide.

Dataset Description

The data is provided by FAO which enables us to have a brief understanding of all the attributes in a country over a period of time.

After some Data Cleaning, we are left with 56735 rows of data for 11 variables collected over a period of 15 years (1999-2016). The picture below shows the head and tail of the dataset.

```
In [4]: df.head()
```

Out[4]:

	Area Code	Area	Item Code	Item	Element Code	Element	Year Code	Year	Unit	Value	Flag	Note
0	2	Afghanistan	21010	Average dietary energy supply adequacy (percen...	6121	Value	20002002	2000-2002	%	87	F	NaN
1	2	Afghanistan	21010	Average dietary energy supply adequacy (percen...	6121	Value	20012003	2001-2003	%	88	F	NaN
2	2	Afghanistan	21010	Average dietary energy supply adequacy (percen...	6121	Value	20022004	2002-2004	%	91	F	NaN
3	2	Afghanistan	21010	Average dietary energy supply adequacy (percen...	6121	Value	20032005	2003-2005	%	92	F	NaN
4	2	Afghanistan	21010	Average dietary energy supply adequacy (percen...	6121	Value	20042006	2004-2006	%	92	F	NaN

```
In [5]: df.tail()
```

Out[5]:

	Area Code	Area	Item Code	Item	Element Code	Element	Year Code	Year	Unit	Value	Flag	Note
148055	9011	Upper-middle-income economies	21061	Average fat supply (g/cap/day) (3-year average)	6123	Value	20122014	2012-2014	g/capita/day	91.1	F	NaN
148056	9011	Upper-middle-income economies	21061	Average fat supply (g/cap/day) (3-year average)	6123	Value	20132015	2013-2015	g/capita/day	91.9	F	NaN
148057	9011	Upper-middle-income economies	21061	Average fat supply (g/cap/day) (3-year average)	6123	Value	20142016	2014-2016	g/capita/day	92.5	F	NaN
148058	9011	Upper-middle-income economies	21061	Average fat supply (g/cap/day) (3-year average)	6123	Value	20152017	2015-2017	g/capita/day	93.2	F	NaN
148059	9011	Upper-middle-income economies	21061	Average fat supply (g/cap/day) (3-year average)	6123	Value	20162018	2016-2018	g/capita/day	94	F	NaN

The variable Area.Code is a categorical variable which can take 248 distinct values. e.g.

2 – Afghanistan

5100- Africa

3 - Albania

4 - Algeria

The variable Area represents Country/Region/Continent.It has 248 distinct values.e.g. * Afghanistan
* Africa
* Botswana
* Central Asia
* Eastern Europe

The variable Item.Code and Item represent the key indicator being measured. They have 23 distinct values

Exploratory Data Analysis

Exploratory data analysis was performed to find some meaningful insights from the dataset.

Through my analysis, I uncovered answers to following questions-

1.GDP trends in the world from 2000-2016

2. The state of hunger in thw world- the number of people undernourished in the world.

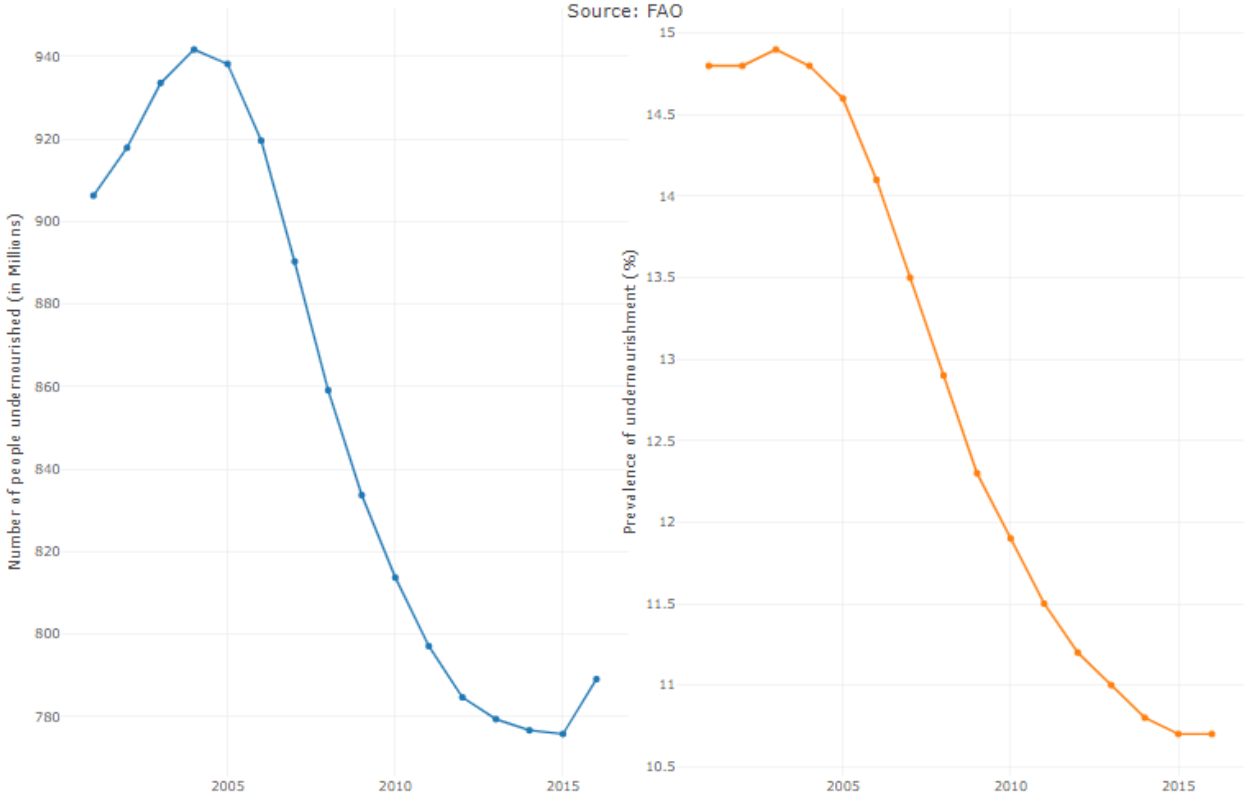
3. State of Malnutrition in the major regions in the world.

4. Understand if there is any relationship between hunger, malnutrition and conflict.

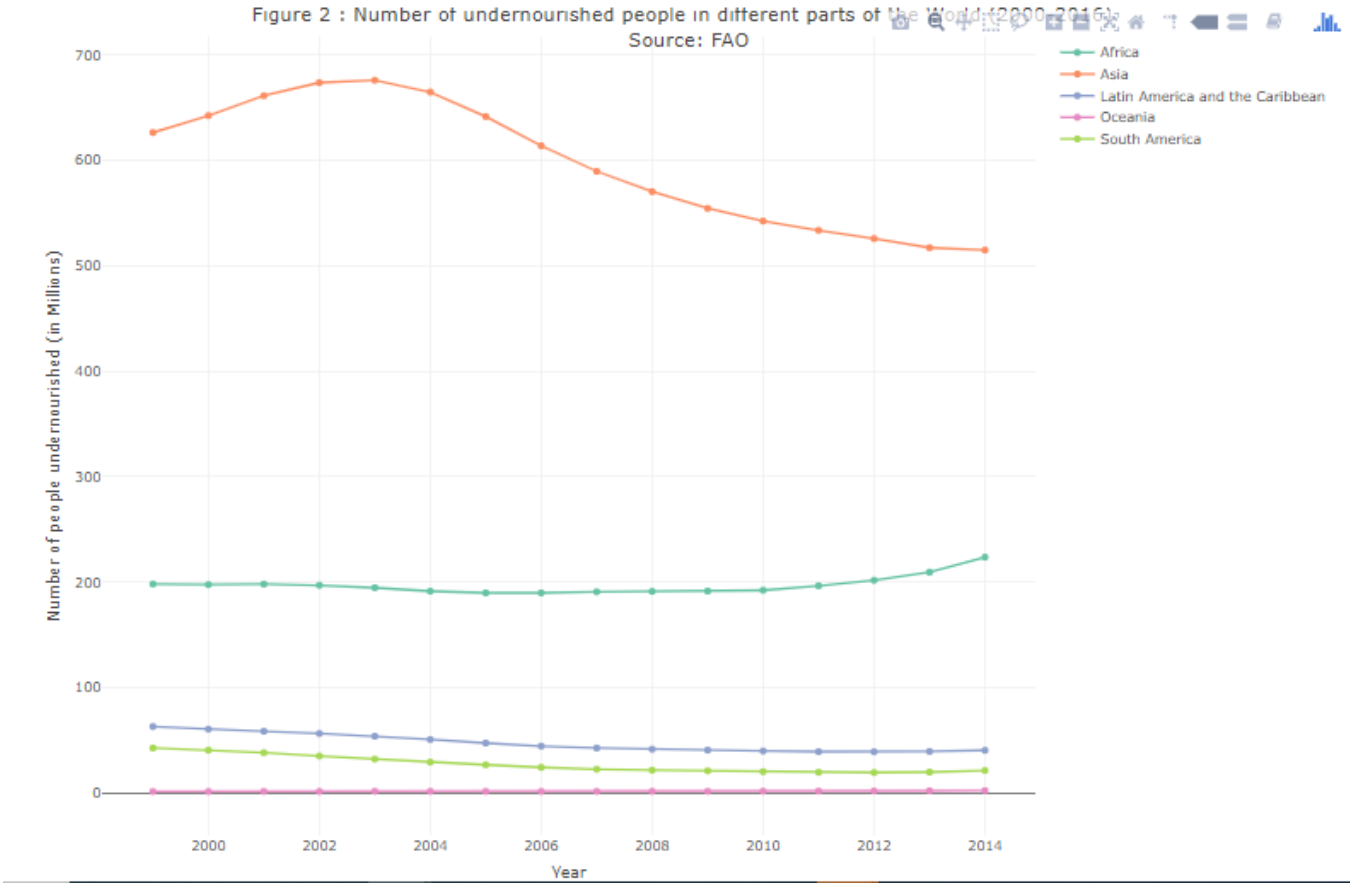
Undernourishment

From figure 1 below, it can be inferred that after steadily declining for over a decade, global hunger appears to be on the rise, affecting 11 percent of the global population. World hunger is on the rise: the estimated number of undernourished people increased from 777 million in 2015 to 789 million in 2016. Also, the proportion of the world's population that suffers from chronic hunger (prevalence of undernourishment) has remain unchanged from 2015 to 2016 after steadily declining for over a decade.

Figure 1: Prevalence and number of undernourished people in the World (2000-2016).
Source: FAO



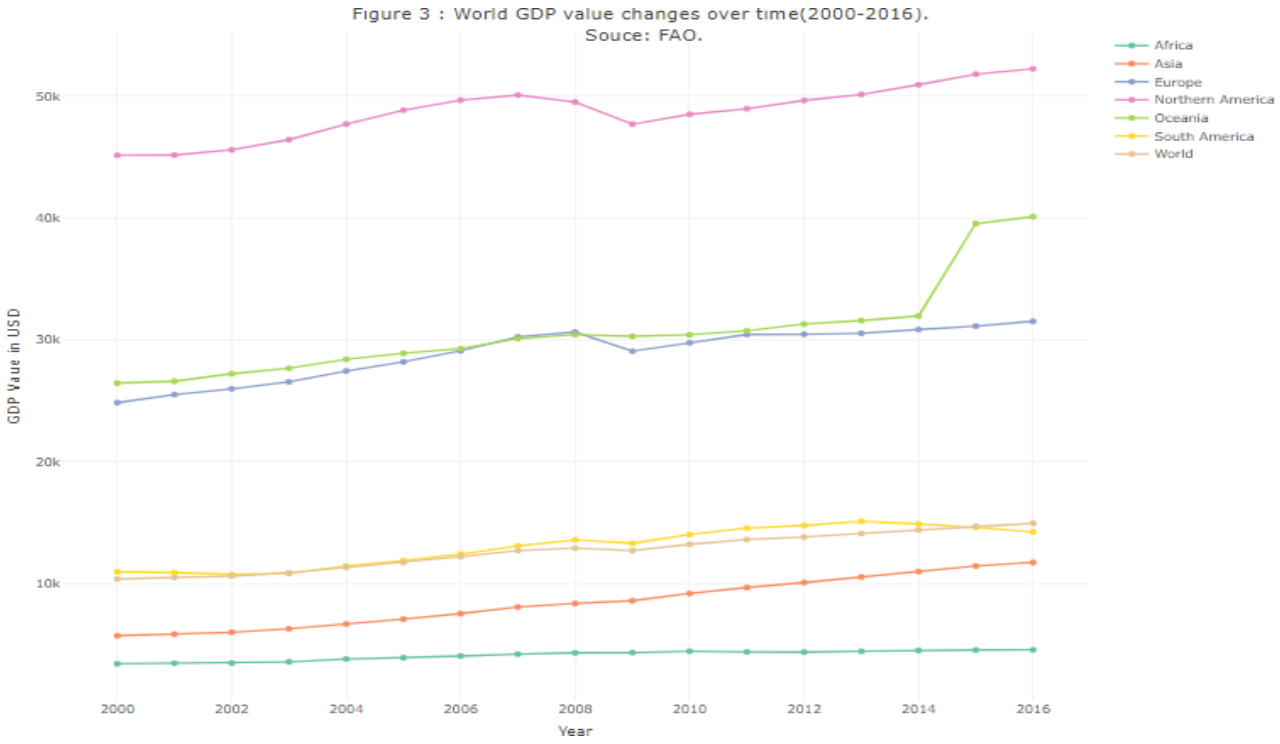
The food security problem has affected the African and Asian continents the most. Over 700 million people are affected by hunger in these two continents alone. While the number of undernourished peole is steadily declining in Asia , it has been on the rise in Africa.



GDP

GDP of a country is a key indicator of the economic state of it's people and is the single most imortant indicator of a country's growth and development.Below is a

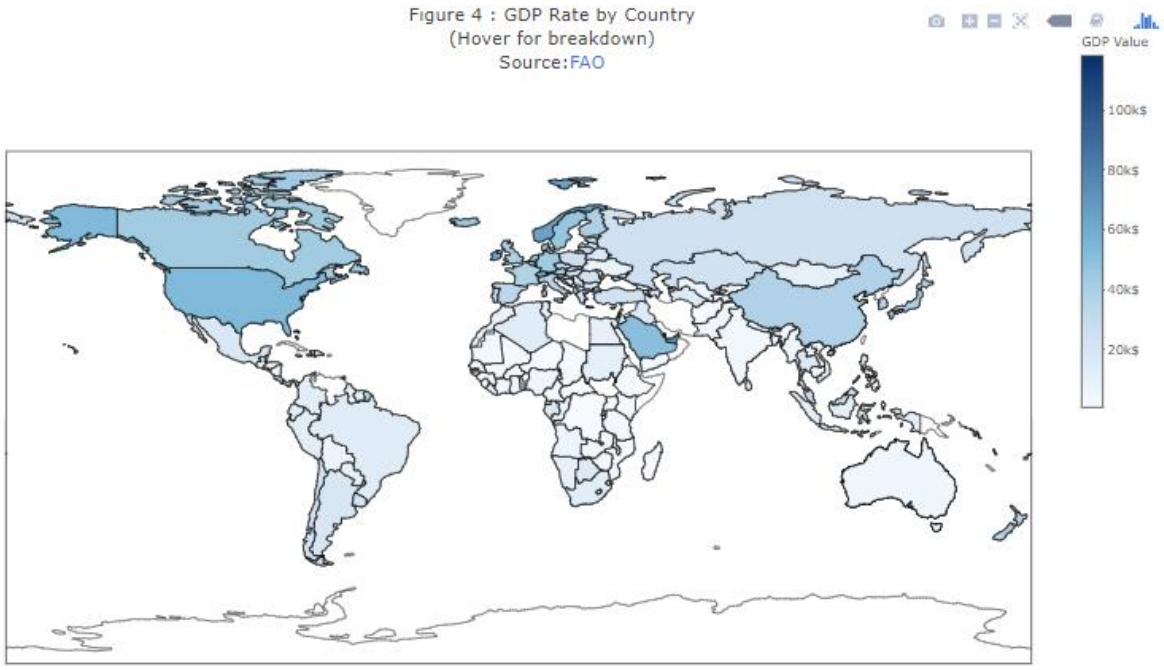
tidy dataset in which we filter the data for world and the six continents over the period 2000-2016.From the tidy data obtained , we created a plot to see the GDP trend during the period 2000-2016.



The average GDP of the world has increased by 44 percent during the period 2000-2016 from $10392 to $14961. Although the GDP of Asia & Africa has stayed below the world average. GDPs of North America, Europe and Oceania is well above the world average.

The map helps us further understand the GDP distribution among the countries.The plot below is made using GDP data for 2016. Asian and African countries have most of the countries with very low average GDP values.

Figure 4 : GDP Rate by Country
(Hover for breakdown)
Source:FAO

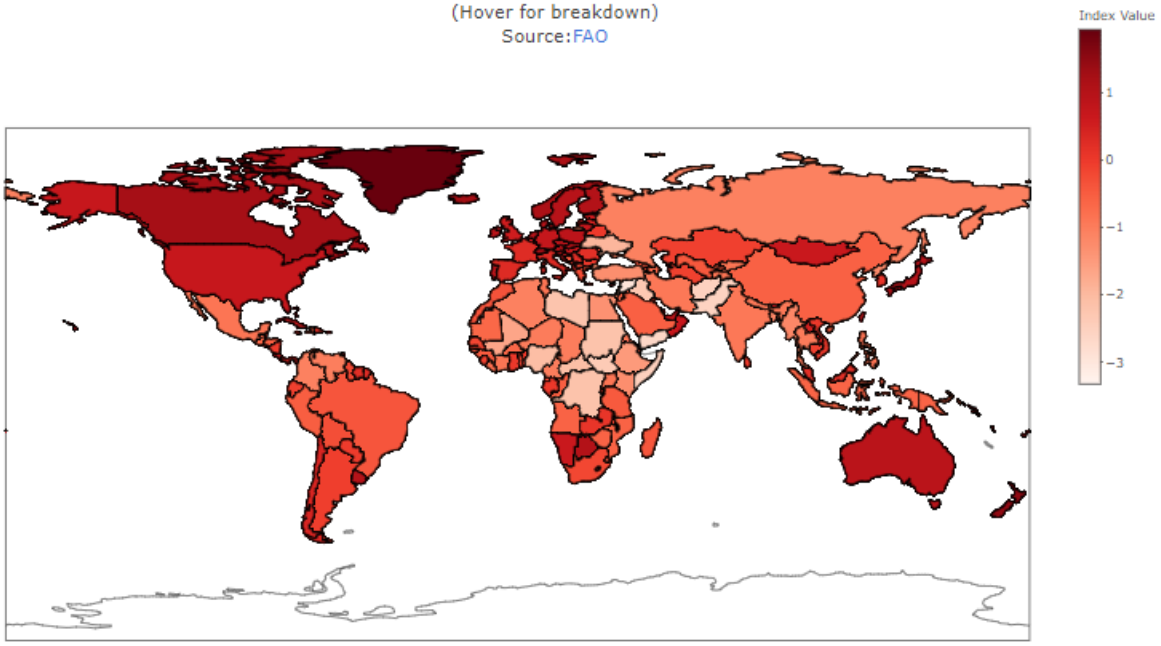


Political Stability

Of the 789 million chronically food-insecure and malnourished people in the world, the vast majority - 489 million -live in countries affected by conflict.

The proportion is even more pronounced for undernourished children. Almost 122 million, or 75 percent, of stunted children under age five live in countries affected by conflict, with the difference in average prevalence between conflict and non-conflict affected countries at nine percentage points.

Figure 7 : 2016 Global Stability Index
(Hover for breakdown)
Source: FAO



Violence and conflict are unevenly distributed across continents, with most concentrated in four regions: the Near East and North Africa, northern sub-Saharan Africa, Central America and Eastern Europe, particularly Ukraine. Many of the most protracted conflicts currently flow across borders and are regional in nature, including in the Horn of Africa, the Great Lakes region of Africa, between Afghanistan, India and Pakistan and from Cameroon, Chad and northern Nigeria across the Sahel.

Conflict is a main driver of population displacement, and displaced populations are among the most vulnerable in the world, experiencing high levels of food insecurity and undernutrition.

Figure 9 : Top 10 most stable countries in the world (2014)

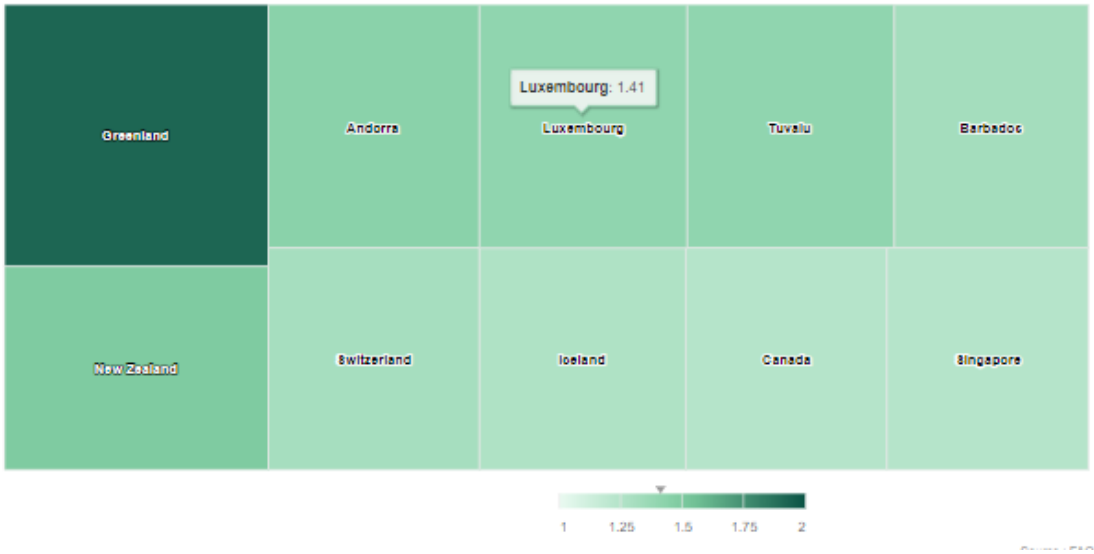
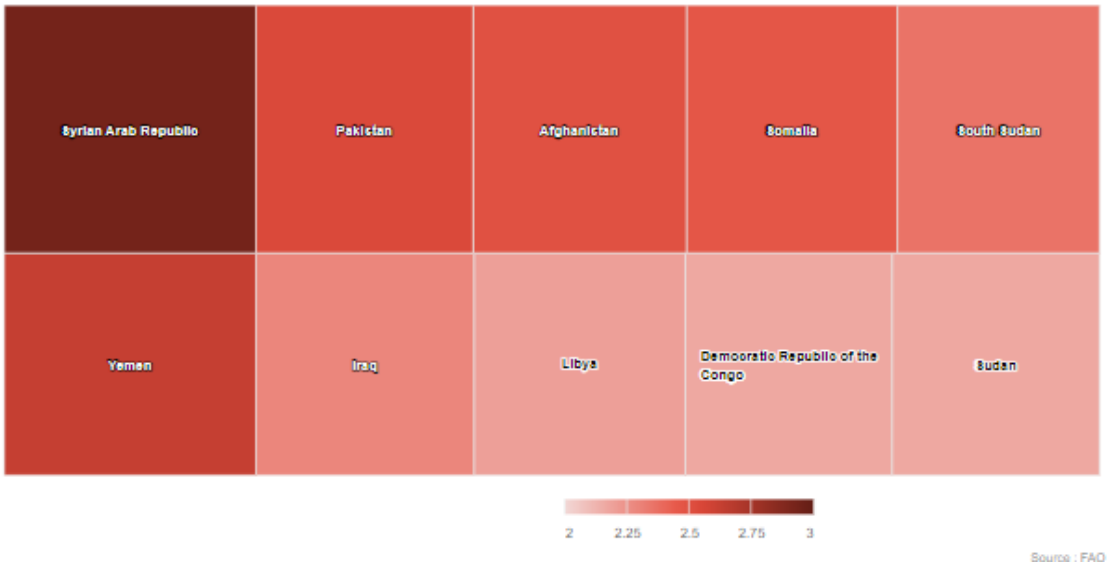


Figure 10 : Top 10 least stable countries in the world (2014)



Assistance to countries affected by conflict should focus on support for investments in building resilience and preparedness.

Malnutrition

Stunting among children under the age of five

Stunting still affects almost one in four children under the age of five years, increasing their risk of impaired cognitive ability, weakened performance at school, and dying from infections.

Stunting among children under the age of five has declined consistently over the last decade from 29.5 percent to 22.9 percent in 2016.

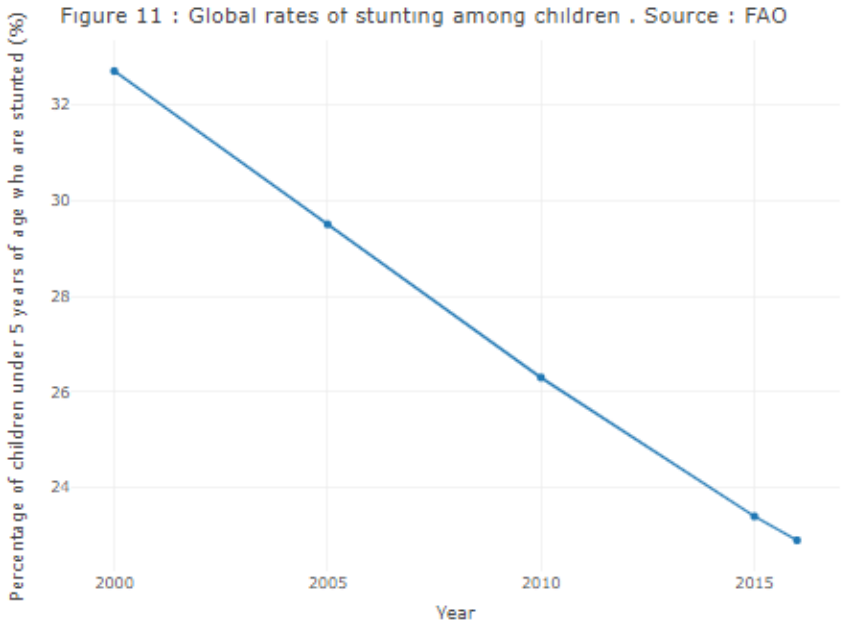
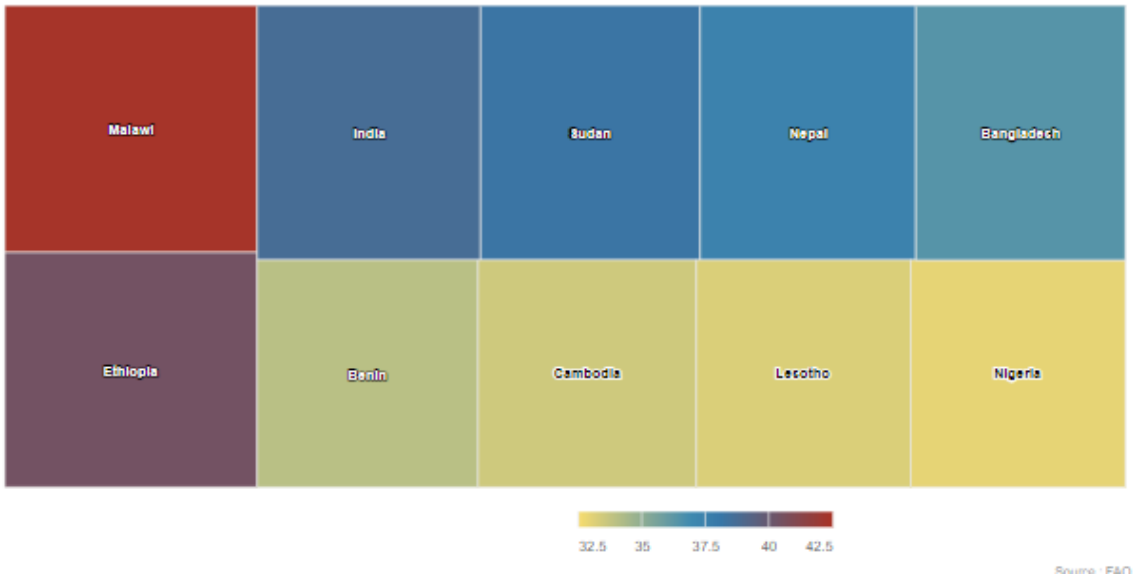


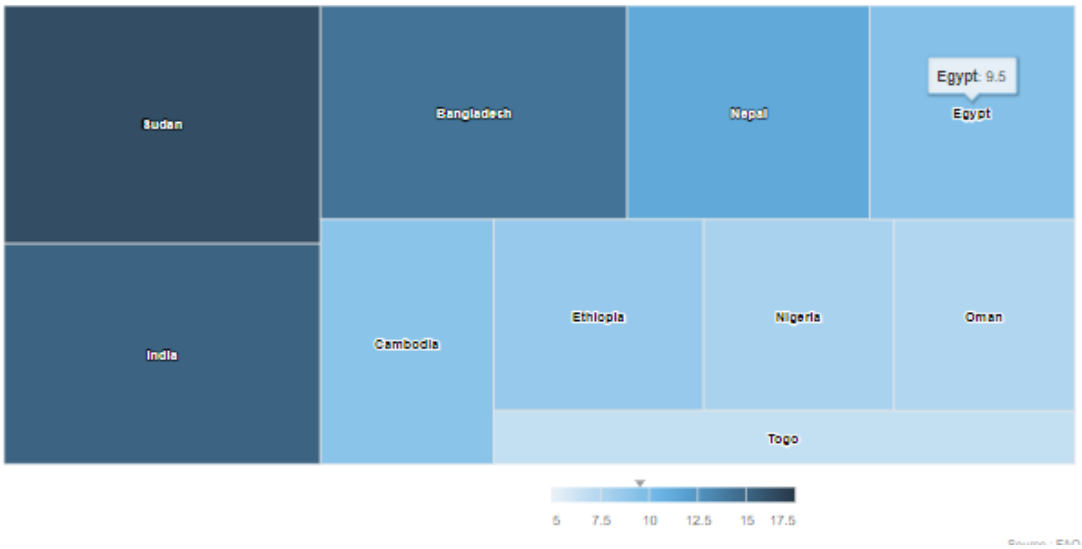
Figure 12 : Top 10 countries with the highest percentage of stunting among children (2014)



Wasting among children under the age of five

In 2016 wasting affected 7.7 percent of children under five years of age worldwide. About 17 million children suffered from severe wasting. South Asian countries such as India, Bangladesh, Cambodia and Nepal along with African countries like Sudan, Egypt, Nigeria and Togo have the highest rates of wasting in the world.

Figure 13 : Top 10 countries with the highest percentage of wasting among children (2014)



Summary

Food security is only one determinant of nutritional outcomes, especially for children. Other factors include: women's educational level; resources allocated to national policies and programmes for maternal, infant and young child nutrition; access to clean water, basic sanitation and quality health services; lifestyle; food environment; and culture.

Particularly in high- and upper-middle income countries, food insecurity and obesity often co-exist - even in the same household. When resources for food become scarce, and people's means to access nutritious food diminish, they often rely on less-healthy, more energy-dense food choices that can lead to overweight and obesity.

A world without hunger and malnutrition by 2030 will be challenging. Additionally, food insecurity and poor nutrition during pregnancy and childhood are associated with metabolic adaptations that increase the risk of obesity and associated non-communicable chronic diseases in adulthood.

Last but not least, changes in dietary patterns and food systems have led to increasing consumption of highly processed foods in many countries. Readily available and accessible, these products are often high in fat, sugar and salt and signal a shift away from traditional diets, further explaining the coexistence of multiple forms of malnutrition within the same communities and even households.